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OTHER

(The names of the authors presenting each paper are shown in bold type)

Paper No: 1.00

Neuroaxial anesthesia methods combined with general anesthesia for beating heart surgery

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Introduction: In Cuba more than 50% of the coronary surgery is carried out with the beating heart modality. Endotracheal general anesthesia has been the technique used in our service. Neuraxial Anesthesia combined with the general anesthesia method, in this last decade, has prevailed in a certain number of the cardiovascular centers of the world, due to their undeniable advantages.
Objectives: To evaluate the effects of the general anesthesia combined with high thoracic epidural blockade or intrathecal administration of morphine/ fentanyl on the intraoperative analgesia, time of extubation, intensive care unit and hospital stay. To identify the frequency of appearance of adverse effects related with the spinal administration of opioides and the frequency of appearance of complications related with regional anesthetic's method.
Methods: A controlled randomized trial was conducted in patients with diagnosis of coronary heart disease, programmed for off pump coronary artery bypass graft surgery. This patients were assigned to one of the following three groups: Control group (n=30): Endotracheal general anesthetic method. Multimodal group (n=29) with thoracic epidural anesthesia: bupivacä[a]na 0,5% (50 mg) 10 ml/single dose and 5 mg of morphine. Multimodal group with intrathecal administration of opioides (n=29): fentanil 1,5 mcg/kg and morphine 8mcg/kg.
Results: The total doses of sistemic fentanyl were smaller in the multimodal groups (2793 micrograms +−915.94 vs 1300 +− 392.79 vs 998 +−29.10; p<0.001) The time of extubation (7.83 hours +−5.24 vs 4.57 +− 2.87 vs 1.72+− 1.07; p< 0.001) and the intensive care un it stay (CG=2.83+−2.42 days, GMOI=1.92+−1.23, GMET=1.41+−0.75, p=0.005) were smaller too, in both multimodal groups, wihtout differents beetwen then, but this methods didn't influence in the hospital stay. A neurological complication associated to neuraxial blockade was not observed.
Conclusions: The multimodal anesthetic methods are more effectives, with they a superior perioperative patients evolution were obtained. Key words: Coronary surgery without extracorporeal circulation, intrathecal opioids, high epidural blockade, spinal anesthesia, epidural anesthesia, multimodality anesthesia.

References

1 Lena P, Balarac N, Lena D, De la Chapelle A, Arnulf JJ, Mihoubi A, Bonnet F. Fast-track anesthesia with remifentanil and spinal analgesia for cardiac surgery: The effect on pain control and quality of recovery. *J of cardiothorac and vasc anesthesia* 2008; **22**(4): 536–42.

2 Yapici D, Ozer ZO, Atici S, Bilgin E, Doruk N, Cinel I, *et al.* Postoperative effect of low-dose intratecal morphine in coronary artery bypass surgery. *J Card Surg* 2008; **23**: 140–45.

3 Tenenbein PK, Derouwere R, Maguire D, Duke PC, Muirhead B, Enns J, *et al.* Thoracic epidural analgesia improves pulmonary function in patients undergoing cardiac surgery. *Can J Anesth* 2008; **55**(6): 344–50.

4 Caputo M, Alwair H, Roger CA, Ginty M, Monk C, Tomkins S, *et al.* Myocardial, Inflamtory, and Stress Responses in off-pump coronary artery bypass surgery with thoracic epidural Anesthesia. *Ann Thorac Surg* 2009; **87**: 1119–26.

5 Moraes L, Canavi V, Canavi S, Sa Malbouissan LM, Carvalo CJ. Intrathecal morphine plus general anesthesia in cardiac surgery: Effect on pulmonary funtion, post operative analgesia and plasma morphine concentration. *Clinics (Sao Paulo)* 2009; **64**(4): 279–85.

Paper No: 57.00

Perioperative Anaesthesiological Management Obesity Patients Undergoing Bariatric Surgery

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Introduction: In the long run, surgical treatment proves to the most effective measure for the treatment of both morbid adipositas and concomitant morbidity. Patients undergoing bariatric surgical procedures are a challenge to the anaesthesiologist: Obesity-associated morbidity, the poten-tially difficult airway and intravenous accesses as well as the demand for effective pain and anti-emetic therapy. Interrestingly, only sparse and conflicting data exist about the perioperative anaesthesiological management of these patients.
Objectives: This study retrospectively reviewed the previous perioperative anaesthesiological management and appraised critically the situation in the follow-ing analysis. A potential for improvement should be identified and included into a new SOP via the PDCA cycle of the quality management system.
Methods: Retrospectively, peri-operative charts of all patients undergoing gastric banding or gastric bypass procedures within the last five years at our obesity treatment centre were analysed. Anesthesiological treatment be-fore, during and after the bariatric surgery as well as the pain therapy were documented. Ad-herence to the standard operating procedures, processing -times and qualification of the anaesthesiologist were further specific benchmarks.
Results: Overall, 224 patient charts were available for this survey (n=103 gastric banding and n=121 gastric bypass). Most of the patients (64 %) had anaesthesiologically relevant co-morbidites. Significant differences between the bypass and the banding groups were found for the median processing times. The need for postoperative opiods differs significantly as well (90 vs. 120 mg Pethidine). No severe anaesthesiological complications occurred. The overall rate of PONV was impressive with 32 %. Based on a pre-existing SOP, even a large number of different anaesthesiologists of various qualification levels was able to conduct anaethesia in a very homogeneous way.
Conclusions: Bariatric patients are a high risk patient group. Present-day anaesthesiological practice as well as the profound implementation of a SOP could permit safe anaesthesia and a minimised risk for complications. Due to the high PONV rate, a routine perioperative PONV prophylaxis should be implemented.

Paper No: 63.00

Candedemia in intensive care unit

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Introduction: There is a need to understand the epidemiology and risk factors associated with candidemia in critically ill patients. The rise in incidence of non-Calbicans candidemia and emergence of antifungal resistance have made such a study necessary. Candidemia in Intensive Care Units (ICUs) setting are of special concern due to high mortality rate.
Objective: The aim of this study was to evaluate epidemiology of Candidemia, associated risk factors and outcome of the disease and antifungal resistance among ICU patients.
Methods: The study was carried out at an Indian tertiary-care teaching hospital, New Delhi, India from a period of three years. January 2005 to December 2008. Prospective analysis of 85 cases of Candida blood stream infection (BSI) done from January 2005 to December 2008. Out of 85 patients, 38 patients were getting repetitive BSI infection and 47 patients got Candida infection only once during their hospital stay. Follow up study was done till discharge or death of the patients and data were analyzed. Isolates were characterized and antifungal susceptibility test was done against fluconazole and amphotericin B.
Results: Non- C. albicans species accounted for majority of episodes of candidemia as reported by our previous study. Patients in ventilators and foleys catheter along with old age were significantly associated with persistence of infection (P ¡Ü 0.05). Overall mortality was (65.8%) 56 of 85 in candidemia patients. The time and the choice of antifungals for the treatment of candidemia were significantly associated with the clearance of the infection (P=0.01) but not with mortality (P=0.23). 30% of the isolates showed decreased susceptibility to fluconazole.
Conclusion: There is a shift in the epidemiology of candidemia and the timely institution of antifungals and combination therapy suggest the better outcome of the patients. Presence of azole resistances is a matter of concern in our isolates.

References

1 Behera B, Singh RI, Xess I, Mathur P, Hasan F, Mishra MC, Candida rugosa: a possible emerging cause of candidemia in trauma patients *Infections* 2010; **38**: 387–393

2 Singh RI, Xess I, Mathur P, Behera B, Gupta B, Mishra MC, Epidemiology of candidemia in critically ill trauma patients: experiences of a level I trauma centre in North India . *J Med Microbiol* 2011; **60**: 342–348

3 Barton RC, Candida rugosa : a new fungal pathogen emerging, but from where? *J Med Microbiol* 2011; Editorial 265

Paper No: 68.00

Effect of Indian Classical Music (Raga Therapy) on Fentanyl, Vecuronium, Propofol requirement and cortisol levels in Cardiopulmonary Bypass

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Introduction: Indian classical music has immense healing potential and considerable stress reducing capabilities which has been harnessed since the Mughal era. Music is regarded as the medicine with no side effects. Cardiopulmonary bypass is associated with immense stress response and high levels of intraoperative cortisol levels which is detrimental to the patient and involves large doses of Fentanyl, propofol and vecuronium requirement to maintain hemodynamic stability intraoperatively. We evaluated the effect of Indian classical music therapy on cortisol levels and the above drugs requirement during cardio pulmonary bypass.
Materials & Methods: After obtaining clearance from Institutional Ethical Committee and written informed consent from patients, 34 patients were assigned to either Group I Music group (n=17) and Blank CD Group II (n=17). The patients awareness level and depth of anesthesia was monitored by BIS (Bispectral index), Fentanyl and propofol infusion titrated to a BIS score of 50 and neuromuscular monitoring was done by Post tetanic count (PTC) in the Aductor Pollicis muscle. Vecuronium was repeated whenever a PTC count of 7 was achieved, in both the groups. Music therapy or blank CD was played by earphone, in the patient's ear in both the groups, from 30 mins before induction to till the patient was shifted to the ICU.
Result: We found significant decrease in the cortisol levels both after Sternotomy and after aortic crosscalmp release. In the Music group (Group I) which was 30 % less than the Blank CD group (Group II). Fentanyl, propofol and vecuronium requirement in the Music group were reduced by 30 % and 25 %and 25 % respectively, which were statistically significant ($P<0.05$)
Conclusion: Intraoperative Indian classical music therapy effectively reduced the intraoperative stress (as revealed by reduced levels of cortisol) and reduced the requirement of drugs (Fentanyl, Propofol and Vecuronium) during Cardiopulmonary Bypass.

References

1 Bagchi, Kalyan. (Ed) (2003) Music, Mind and Mental Health. New Delhi.
2 Tony Wigram, Inge Nygaard Pedersen and Lars Ole Bonde. Jessica Kingley Publishers Philadelphia 2002: A comprehensive guide to music therapy, Theory, clinical practice Research & Training.
3 Nisson, Rawal N, Unosson M, A comparison of intra-operative or postoperative exposure to music–a controlled trial of the effects on postoperative pain. Anaesthesia. 2003 Jul; 58(7):699–703.
4 Yale University School of medicine 2003 Effects of music therapy.
5 Sairam TV, (2004a) *Medicinal Music*. Chennai: Nada Centre for Music Therapy
6 Sairam TV, (2004b) *Raga Therapy*. Chennai: Nada Centre for Music Therapy
7 Sairam TV, (2004c) *What is Music?* Chennai: Nada Centre for Music Therapy
8 Lewis. Anesth Analg 2004; 98:533–6
9 Yapici N, Tarhan IA, Kehlibar T, Coruh T, Arslan Y, Yilmaz M, Yapici F, Ozler A, Aykac Z, Blood Cortisol Levels On Cardiopulmonary Bypass After Methylene Blue Administration . *The Internet Journal of Thoracic and Cardiovascular Surgery*. 2008; **2**.
10 Miller 7th edition Neuro muscular monitoring chapter 47

Paper No: 69.00

Why so much fear to anesthesia?

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Introduction: There are only a few occasions in the course of a person's life, in which one faces the biggest existential problem of humanity, fear of death. This seems to happen when one has the need to undergo an anesthetic-surgical procedure; it is then when the bare possibility of harm and death appears. And it compulsorily reminds us the finite nature of human life.
Objective: To verify if it is true the observation that fear of anesthesia is generalized among our patients; and to define which would be the possible causes that more frequently provoke this fear. Finally, it will be evaluated if they are related to the innate fear of death. Material and methods: A survey was designed to be answered anonymously, with eight question. Two were open answers: the definition of Anesthesia and to what he/she associated the word Anesthesia. The other questions were multiple choices. 456 Patients between 18 to 70 years old, were surveyed; xx were facing scheduled surgery and XX were not.
Results: 48% answered they would be afraid of anesthesia if they had to be operated. 48.9 % were worried the same by the anesthetical act as by the surgical one. 75 % of the patients recognized they had never been interested in getting information about how anesthesia is done. 68.8% knew the anesthesiologist is a physician. Only 5% could define correctly the word anesthesia. Those people younger than 30 years old were more afraid of anesthesia; being their biggest fear to feel pain or not to be asleep enough. The same happened to those ones who had never had an anesthetic experience. While those over 30, who had already been anesthetized, felt less fear. They were afraid of dying in the operating room.

Discussion: Since most of the surgical patients were over 30, and agreeing with the other studies on this matter, it could be inferred that the biggest fear of our patients is to die during anesthesia. Anyway, the group that expressed fear to suffer pain because of insufficient anesthesia, was surprisingly bigger than expected. What called our attention was the little interest, of this population, to know more about anesthesia and the anesthesiologist's role.
Conclusion: Although the fear of death that our patients face when they are going to be anesthetized may not be altered, we consider we must reduce the unfounded fear of not being sufficiently asleep or feeling pain, by getting closer to the patient to dissipate the myth of insufficient anesthesia. That way we will have added comfort to our patients.

Keywords: Anesthesia; fear; pain; death

Paper No: 82.00

The impact of right ventricle upon early cardiac mortality of patients with ischemic mitral regurgitation undergoing mitral valve surgery

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Background: The aim of this retrospective study is to evaluate if right ventricular dilatation or dysfunction might affect early cardiac mortality of patients with ischemic mitral regurgitation (IMR) undergoing mitral valve surgery (MVS).
Methods: From March 2006 to May 2008, 103 patients with IMR, electively operated on by a single surgeon (AMC), were enrolled in the study. Patients with severe tricuspid regurgitation were excluded from the study due to misleading assessment of tricuspid annular plane systolic excursion (TAPSE); the last item was used to evaluate RV function. Diastolic RV diameter was also evaluated. The primary end-point was early cardiac mortality. All the analyses were validated in 1000 bootstrap samples. This retrospective study was approved by Institutional Review Board of University of Chieti and this waived the patients' consent.
Results: Ten patients (9.7%) died by 30 days from the operation due to cardiac cause. Right ventricular diameter (RVD) was inversely correlated to TAPSE (r=-0.349). Thus, logistic regression was performed including either RVD or TAPSE separately. Lower TAPSE was a risk factor for increased early cardiac mortality (OR=0.76, 95%CL=0.56-0.96) regardless of tricuspid surgery. To determine cut-off value of TAPSE, ROC curve analysis was performed: TAPSE (AUC=0.75) with a cutoff of 15mm (sensitivity=80%, specificity=78.5%, OR=14.5)
Conclusions: Right ventricle cannot be still considered "the Cinderella" anymore in carddiac surgery. The presence of dysfunctioning RV, the likelihood of cardiac death increases, especially if TAPSE is equal or lower than 15mm. Nowadays, we know that in mos of cases, there is an interdipendence between the two ventricles, so improving LV function could be sufficient to improve also RV function. In all the other cases, we speculate that very likely, a more strict intraoperative moritoring associated with pulmonary vasodilators could improve the outcome, but this question has to be verify.

Paper No: 112.00

PAI-1 and t-PA/PAI-1 complex potential fibrinolytic markers for postoperative bleeding in cardiopulmonary bypass patients

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Introduction: Excessive bleeding (EB) remains a serious problem following cardiac surgery. Bleeding after cardiac surgery is multifactorial in aetiology but fibrinolysis plays a determinant role.
Objectives: We hypothesized that lower preoperative level of Plasminogen activator inhibitor type-1 (PAI-1) and lower ratio of tissue – plasminogen activator/PAI-1 complex (t-PA/PAI-1) after surgery may be associated with enhanced fibrinolytic activity and increased bleeding.
Method: A total of 88 adult cardiac surgical patients (mean age 66 $\pm$ 10 years, 48% men) who did not receive antifibrinolytic prophylaxis were enrolled in a prospective study. Variables were collected preoperatively (T0); at admission in intensive care unite (T1), at 6 and 24 hours (T6, T24) after surgery. To allow comparison between patients, two groups were made according to 24-hour postoperative bleeding volume: group I>500ml/24h, group II ? 500ml/24h. Correlation of blood amount with routine coagulation tests and fibrinolysis parameters (PAI-1, t-PA/PAI-1 complex, D-dimer) were analysed using SPSS17.0 as linear regression (Pearson's correlation coefficient). Comparisons between groups were done with two-sample t-test for continuous data, with chi-square test for categorical data. The statistical significance was defined as p value<0.05.
Results: Nine patients were excluded from the study due to surgical bleeding. 45% of patients (n=38) had blood loss>500ml/24 hours and were registered as I group. Postoperative bleeding volume significantly correlated with the preoperative level of PAI-1 (r=- 0.3, p=0.009), with haemoglobin and platelet count at T6 after surgery (r=−0.42,

p<0.001; r=- 0.3, p=0.02). Level of preoperative PAI-1 and t-PA/PAI-1 complex after surgery significantly differed between I group (n=38) and II group (n=41): PAI-1 19±8.3 vs. 29±13, p<0.001; t-PA/PAI-1 3±1.4 vs. 4.2±2.4, p=0.012. Patients in I group showed a significantly higher level of D-dimers after surgery: at T1 - 318 vs. 228, p=0.05; at T6 – 333 vs. 234, p=0.03; at T24 – 300 vs. 197, p=0.007.

Discussion: EB after cardiac surgery is associated with different fibrinolytic activity. There are patients with a lower inhibitory potential for fibrinolysis who could benefit most from antifibrinolytic prophylaxis.

Conclusion: A lower preoperative level of PAI-1 and lower level of t-PA/PAI-1 complex just after surgery may lead to higher levels of D-dimer later on and could be used as fibrinolytic system markers of enhanced fibrinolysis and increased bleeding tendency.

Paper No: 133.00

Influence of PAI-1 promoter polymorphism to fibrinolytic activity of patients after on-pump cardiac surgery

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Introduction: Low plasminogen activator inhibitor -1 (PAI-1) and tissue – plasminogen activator/PAI-1 (t-PA/PAI-1) complex are associated with increased bleeding after on-pump cardiac surgery. PAI-1 levels are influenced by genetic factors. The PAI-1 gene promoter contains -675(4G/5G) polymorphism.

Objectives: Investigate effect of the PAI-1 promoter -675(4G/5G) polymorphism on PAI-1, t-PA/PAI-1 concentrations and on bleeding volume after cardiac surgery.

Methods: Ninety patients who did not receive antifibrinolytic prophylaxis were included in the prospective study. Study was approved by the institutional Committee of Ethics. We obtained informed written consent from all patients for their inclusion in the study. Seven patients were excluded due to surgical bleeding. Eighty-three patients were classified according to PAI-1 genotype: 4G/4G (n=21), 4G/5G (n=42), 5G/5G (n=20). Data of fibrinolysis were recorded: PAI-1 level preoperatively, D – dimer at 0 h, 6 h and 24 hours after surgery, t-PA/PAI-1 complex 24 hours postoperatively. The groups were compared concerning factors which might influence the postoperative bleeding: age, gender, body mass index, surgical parameters, hemoglobin, platelets and fibrinogen. Postoperative bleeding volume was registered as milliliters 24 hours after surgery. Association between genetic polymorphism, fibrinolysis parameters and postoperative 24-hour blood loss were analyzed using SPSS 18 (Student T-test, X2, Fischer's test, Pearson coefficient).

Results: Patients with the 5G/5G genotype had significantly lower preoperative PAI-1 levels (17±10.8 vs. 24±9.6, p=0.04), higher D-dimer levels at 6 h (371±227 vs. 232±184, p=0.03) and at 24 h (326±207 vs. 209±160, p=0.05) and greater postoperative blood volume (641±210 vs. 432±167, p=0.001) compared with 4G/4G genotype. Preoperative PAI-1 level also statistically significantly differed between 5G/5G and 4G/5G genotypes (17±10.8 vs. 27±13, p=0.004). There were no significant differences in blood loss between 5G/5G and 4G/5G genotypes. Complex of t-PA/PAI-1 did not statistically differed between 3 genotypes. The highest level of t-PA/PAI-1 complex had patients with the 4G/5G genotype (4G/5G – 3.9±2.1; 5G/5G – 3.6±2.4, 4G/4G – 3.1±1.8). Correlation was found in 4G/5G genotype between PAI-1 level and blood loss (r=− 0.4, p=0.01) and t-PA/PAI-1 complex and blood loss (r=− 0.32, p=0.04). Association between PAI-1 and t-PA/PAI-1 complex (r=0.5, p=0.02) was observed in 4G/4G genotype.

Conclusions: PAI-1 promoter - 675 (4G/5G) polymorphism affects PAI-1 concentration, D-dimer level and blood loss indicating that patients with 5G/5G genotype has enhanced fibrinolytic activity.

Paper No: 138.00

The effect of aminophylline versus milrinone on ischemia-reperfusion myocardial injury during open heart surgery

Hamdy Youssef

Introduction: Cardioplegic arrest during cardiopulmonary bypass (CPB) is essential for the majority of cardiac surgical procedures; Cardioplegia protects the myocardium by providing continuous or intermittent oxygen while simultaneously reducing cardiomyocyte oxygen demand, but it does not inherently increase the ischemic–reperfusion injury tolerance of the cardiomyocytes. Aminophylline and milrinone by their phosphodiesterase inhibitor and anti-inflammatory activity may decrease this type of injury. Aim of the work: This study has been designed to compare between the protective effect of aminophylline and milrinone during open heart surgery for valve replacement with CPB.

Patients and Methods: After approval from the local ethical committee, Assiut university hospital,sixty adult patients undergoing elective single valve replacement were randomized to receive aminophylline 5 mg/kg (n=20), milrinone 50 μg/kg (n=20), or normal saline as control group (n=20) through intravenous infusion 10 minutes before the aortic cross-clamping. The cardiac troponin I, inotrope score, duration of mechanical ventilation, and length of

ICU stay and other hemodynamic variables were measured and recorded.
Results: There were no differences between the three groups with regard to clinical variables. Cardiac troponin I raised significantly after declamping in the three groups, however it was significantly lower in aminophylline and milrinone group compared to control group immediately after CBP and after 8 hours with no significant differences between aminophylline and milrinone group. inotrope score duration of mechanical ventilation and length of ICU stay showed no significant differences between the three groups.
Conclusion: administration of aminophylline or milrinone reduces the subclinical myocardial injury with no difference between both agents and with no effect on the hemodynamic parameters or short term clinical outcome in patients undergoing single valve replacement with CPB.

Paper No: 141.00

Patients value in a pre-anesthesia consultation: is possible to evaluate de quality patient perception in anestesiology care?

Maria Jose Mayorga-Buiza and Mercedes Echevarria-Moreno

Introduction: An indicator of health service quality is the degree of patient satisfaction with care. The patient satisfaction with the anesthesiologist is difficult to measure in the OR for obvious reasons. However, preoperative consultations could be a perfect situation for quality of care evaluation and patient perception.
Objective: To analyze which variables most influence the degree of satisfaction of our patients after preoperative consultation.
Material and Methods: We conducted an anonymous survey in randomized patients scheduled for pre-anesthesia evaluation. The survey included 4 questions on a categorical scale, (no satisfied, somewhat satisfied, regular satisfied, satisfied and very satisfied): Timeliness of care, Compression of information received, Respect and Degree of Satisfaction, and about the knowledge of anesthesiologist name who evaluated them. Surveys were conducted from January 2007 /December 2008. The statistical analysis was a binary logistic regression model, which selected the best set of predictors of satisfaction. (p ? 0.05).
Results: 1263 surveys were conducted. 98.7% of respondents considered their degree of satisfaction satisfied /very satisfied. The 96.95 felt sufficiently informed /well enough. 83.3% felt that punctuality in the schedule was good or very good but only 71.8% knew the name of the anesthesiologist who attended them. Regression analysis found: the highest degree of satisfaction were related to information received (OD 12.788, p <.0001), perception of received evaluation (OD 10.41, p <.003) and punctuality (OD 7.18, p <.0001). Patients were not able to remember the name of anesthesiologist in more that 25% of surveys (this item did not influence the analysis).
Conclusion: The evaluation of patient perception of anesthesiology care is possible in the pre-anesthesic consultation procedure. The degree of satisfaction is linked more to the anesthesiologist's ability to communicate that to other variables, and induces them to strengthening in the attitudes of empathy and training in the clinical interview.

References

1 Hadjistavropoulos HD, Dobson J, Boisvert JA. Information provision, patient involvement and emotional support: prospective areas for improving anesthetic care. *Can J Anaesth* 2001; **48**: 864–870.
2 Heidegger T, Huseman Y, Nuebling M, Morf D, Sieber T, Huth A, *et al.* Patient satisfation with anaesthesia care: developement of a psychometric questionaire and benchmarking among six hospitals in Switzerland and Austria. *Br J Anaesth* 2002; **89** : 863–872.
3 Dexter F, Candiotti KA. Multicenter Assessment of the Iowa Satisfaction with Anesthesia Scale, an Instrument that Measures Patient Satisfaction with Monitored Anesthesia Care. *Anesth Analg.* 2011 Apr 25.

Paper No: 195.00

Situation diagnosis of postoperative pain

Cristian Humberto Bosio

Pain is an "unpleasant sensory and emotional experience, related to actual or potential tissue damage, or described in terms of such damage". 1 Postoperative pain is a type of acute pain iatrogenic through the surgery with him being excluded biological function. Today the consequences of poor postoperative management are known. 2,3,4 Satisfaction is currently used as an indicator of excellence in the quality of care and improvement programs are intended to standardize quality pain care.5,6 The overall objective of this study was to evaluate postoperative pain patients admitted to surgical wards and thus provide data to assist in the strategic policy planning for treatment and sizing the need for further efforts to improve the quality of care. In January 2011, a descriptive cross sectional study was done with patients scheduled for elective surgery who agreed to collect data in a survey during the preoperative and postoperative period. Also collected information on painkillers treatments prescribed. Were processed data obtained from the descriptive analysis of variables in examination. The study observed that 79% of respondents during the preoperative (n=44), thinks that the pain in the first days after surgery, is unbearable. 78% of respondents in the postoperative period (n=55) expressed pain in the first 24 hours following surgery, 54% of these, reported some degree of inadequate analgesia at the time of the interview. We also found a significant relationship between greater

levels of pain and greater patient demand for extra analgesic doses according to Fisher's exact test ($p = < 0.05$). This study showed a high prevalence of incorrect treatment to meet the needs of analgesia in postoperative pain. Diclofenac was the drug most used in 91% of cases and there was a 80% overdose of it. Only one case of opioid analgesics prescription as part of treatment was reported. 93% of cases were classified as inadequate analgesic treatment because of: (i) lack of extra analgesic dose prescription in the presence of pain (93%); (ii) overdosage with NSAIDs (78%); (iii) inadequate analgesia (62%); (iv) dangerous associations between drugs of the same group (25%). The level of patient satisfaction with analgesic therapy implemented by health personnel was very high as evidenced in previous studies.7 It is recommended that a committee of acute pain to make analgesia protocols. Also the creation of a unit for pain to control the patients, monitor the analgesic methods and teaching activities for all the staff involved.

References

1 Finkel DM, Schlegel HR. Dolor postoperatorio, conceptos básicos y fundamentos para un tratamiento adecuado. Available at: http://www.sld.cu/galerias/pdf/sitios/anestesiologia/dolor_postop.pdf. Visited in October 2010.

2 Bolibar I, Catala E, Cadena R :El dolor en el hospital: de los estándares de prevalencia a los de calidad. Rev. Esp. *Anestesiol. Reanim.* (2005); **52** :131–140. Available at: http://www.sedar.es/restringido/2005/3/131.pdf . Visited in October 2010.

3 Finkel DM, Schlegel HR. Op. Cit.

4 Valentín-Lopez B, Garcia-Caballero j, Muñoz-Ramón JM, Aparicio-Grande P, Diez-Sebastián J, Criado-jimenez Atención del dolor postoperatorio en un hospital de tercer nivel: situación inicial previa a la implantación de un programa de calidad. Esp. *Anestesiol. Reanim.* (2006); **53** :408–418. Available at: http://www.sedar.es/restringido/2006/n7_2006/3.pdf. Visited in October 2010.

5 Zas-Ros BLa satisfacción como indicador de excelencia de la calidad de los servicios de salud; Rev. Electrónica Psicologia Cientifica. Available at:http://www.psicologiacientifica.com/bv/psicologia-80-1-la-satisfaccion-como-indicador-de-excelencia-en-la-calidad-d.html. Visited in October 2010.

6 Gallego Jl, Rodriguez-de-la-Torre MR, Gallego Vasques-Guerrero JC, Gallego Gil M; :Estimación de la prevalencia e intensidad del dolor postoperatorio y su relación con la satisfacción de los pacientes. *Rev. Esp. Soc Esp. Dolor.* (2004); Vol 11 n.4. Available at: http://scielo.isciii.es/scielo.php?pid=S1134-80462004000400003&script=sci_arttext . Visited in October 2010.

7 Valentín-Lopez B, Garcia-Caballero j, Muñoz-Ramón JM, Aparicio-Grande P, Diez-Sebastián J; Criado-jimenez, Op Cit.

Paper No: 199.00

Effect of single dose gabapentin on postoperative pain and opioid consumption following total abdominal hysterectomy: A Dose Finding Study

Anand Kumar

Introduction: The multimodal analgesia involves the use of different analgesics is recommended in current practice to provide superior pain relief and to reduce opioid consumption and its side effects. Gabapentin in different dosages has been found effective to reduce opioid consumption and decreasing postoperative pain. We designed this study to find minimum optimal dose of gabapentin to be used with pethidine in our population.

Objective: To determine the minimum effective dose of gabapentin for postoperative pain and reduced opioid consumption in patients undergoing total abdominal hysterectomy.

Methodology: After informed consent eighty seven patients were included in this double blinded randomized control study. Patients were assigned randomly to one of the three groups to receive capsule gabapentin orally 300mg, 600 mg and 900mg respectively, one hour before surgery. Postoperatively pethidine consumption, pain score and side effects of gabapentin were monitored for 24 hours. Rescue analgesia was given and monitored.

Results: The groups did not differ demographically for age, weight and height. Mean pethidine consumption in all three groups was 331 mg /24 hours with no statistical difference among the groups. The results support the use of 300mg single oral dose of gabapentin in reducing pethidine consumption for postoperative analgesia Rescue analgesia and number of goods and demands on PCIA data were also well matched with no statistical significance. The groups also did not differ for side effects of gabapentin like nausea, vomiting, somnolence and dizziness, however extubation was delayed in 900mg group.

Conclusion: A single oral dose of gabapentin 300mg given preoperatively is as effective as higher dose of 600-900mg for postoperative analgesiawith reduced pethidine consumption.

References

1 Van de Vusse AC, Stomp-van den Berg SG, Kessels AH, Weber WE. Randomised controlled trial of gabapentin in Complex Regional Pain Syndrome type. *BMC Neurol.* 2004; **4**: 13.

2 Seib RK, Paul JE. Preoperative gabapentin for postoperative analgesia: *A meta-analysis. Can J Anesth.* 2006; **53**: 461–9.

3 KY Ho, Gan TJ, Habib AS. Gabapentin and postoperative pain – A systematic review of randomized controlled trials. *Pain.* 2006; **126**: 91–101.

4 Dierking G, Duedahl TH, Rasmussen ML, *et al.* Effects of gabapentin on postoperative morphine consumption and pain after abdominal hysterectomy: A randomized, double-blind trial. *Acta Anaesthesiol Scand.* 2004; **48**: 322–7.

5 Rorarius MF, Mennander S, Suominen P. Gabapentin for the prevention of postoperative pain after vaginal hysterectomy. *Pain* 2004; **110**: 175.

6 Dierking G, Duedahl TH, Rasmussen ML, Fomsgaard JS, Møiniche S, Rømsing J, *et al.*Effects of gabapentin on postoperative morphine consumption and pain after abdominal hysterectomy: a randomized, double-blind trial. *Acta Anaesthesiol Scand.* 2004Mar; **48**(3): 322

7 Peng PW, Wijeysundera DN, Li CC. Use of gabapentin for perioperative pain control – a meta-analysis. *Pain Res Manag*. 2007 Summer; **12**(2):85–92.

Paper No: 214.00

The Use Of Sugammadex In Orthopedic Surgeries For The Correction Of Idiopathic Scoliosis With Evoked Potentials Monitorization

Jorge Barrios Alarcon, Wagner Kouno, Ricardo Ferreira, Oswaldo Cavalari and Luis Sergio Marques

Sugammadex is a new pharmacologic agent utilized for the rapid reversal of non-depolarizing muscle relaxants. The purpose of this study was to demonstrate the possibility of the use of sugammadex for reversal of rocuronium-induced muscle relaxation before the start of intraoperative neurophysiologic monitoring (IONM) during idiopathic scoliosis with somatosensory evoked potentials (SSEP).
Methods: 20 adult patients, with a mean age of 34+10 years, ASA I or II were involved in the study. They all had the diagnosis of scoliosis and were scheduled for surgery to correct their scoliosis with the use of SSEP. Immediately before the start of the surgical instrumentation and the start of the IONM, sugammadex was administered according to the train of four (TOF) and analyzed with the IONM at 0, 1 and 2 minutes.
Results: After 2 minutes of the administration of sugammadex, all patients had a TOF$>$0.9.
Conclusion: The utilization of a rocuronium specific antagonist was efficient in promoting the normalization of the motor conduction-response to the stimuli of the IONM in a predictable time.

Paper No: 234.00

Inexperienced doctors get remarkable skills in fiberoptic intubation after specific training in a virtual airway simulator

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Introduction: It is very essential for anaesthesiologist to be in control when dealing with a difficult airway. Therefore students need to be trained in this discipline. The sooner the better. A somewhat newer method is the use of virtual airway simulators.
Objectives: The purpose of this study was to see whether completion of simulator training with a satisfactory and specific endpoint could improve doctors ability to make a fiber optic intubation significantly faster and more confident than inexperienced doctors.
Methods: This study was a randomized clinical study. Ten doctors were included equally split between the control group and the simulator group. Five doctors received training in the Educational Lab at The University Hospital "Rigshospitalet" in Copenhagen, Denmark. Within a week they had to perform a real fiber optic intubation on an anaesthetized patient in the operating room. The endpoint was time spend during the procedure.
Results: The ffive doctors in the simulator group practiced in average 54 minutes $\pm$ 8 minutes and completed between 22 and 33 virtual fiber optical intubations. Then they had to pass a test with specific endpoints: time used (less than 60 seconds), number of collisions (maximum 10) end effectiveness (greater than 80%). Doctors in the control group were significantly slower to FOI compared to doctors who joined the simulator group. Using Mann-Whitney test finding a p-value $<$0.05. The median difference is 266 and 95% confidence interval [$-$32 to 542].
Conclusion: The use of the virtual airway simulator should become a compulsory part of educating the first year residents in the management of difficult airways. The doctors can gain significant better experience in the use of a fiber optic scope before meeting a patient in the operating room.

References

1 Rowe R, Cohen RA. An Evaluation of a Virtual Reality Airway Simulator. *Anesth Analg* 2002; **95**:62–6.
2 Rosenstock C *et al.* Qualitative analysis of unanticipated difficult airway management. *Acta Anaesthesiol Scand* 2006; **50**:290–7
3 Mayrose J *et al.* Utilization of Virtual reality for endotracheal intubation training. *Resuscitation* 2003; **59**:133–8
4 Goldmann K, Steinfeldt T. Acquisition of basic fiberoptic intubation skills with a virtual reality airway simulator. *J. of Clinical Anaesthesia* 2006; **18**:173–8.
5 Blum MG, Powers TW, Sundaresan S. Bronchoscopy Simulator Effectively Prepares Junior Residents to Competently Perform Basic Clinical Bronchoscopy. *Ann Thorac Surg* 2004; **78**:287–91
6 Crawford SW, Colt HG. Virtual Reality and Written Assessments of Potential Value to Determine Knowledge and Skill in Flexible Bronchoscopy. *Respiration* 2004; **71**:269–275
7 Letter from Camilla Lindholm Rasmussen Cand. Jur.

Paper No: 240.00

Local anesthesia for awake craniotomy

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The intracranial tumor resection on eloquent motor areas are at high risk of developing neurological deficit intrasurgery. Many anesthetic techniques are used to perform this surgical procedure with sedation or intermittent anesthesia Actually, not described multimodal techniques combining regional anesthesia, sedation and systemic analgesia in these patients. We use a technique awake, consistent with the implementation of a complete blockade of scalp plus sedation and analgesia.
Objective: To assess the quality of anesthesia, reliability neurological monitoring and control of anxiolysis
Methodology: The study included 6 patients diagnosed with tentorial tumor in neighborhood to eloquent areas with radiological signs of intracranial hypertension. Patients without pulmonary or cardiac pathology with Midazolam was titrated with doses of 0.2 to 04 mg / kg IV dose and remifentanil 0.03 to 0.05 ug / kg / min plus and scalp block with lidocaine 2% WOE and bupivacaine 0, WOE 5% at level of greater and lesser occipital, supraorbital and inferior trochlear and mandibular nerves. Antiemetic prophylaxis. We evaluated nausea, vomiting and respiratory depression, cooperative patient, occurrence of neurological deficit, and postoperative pain.
Results: All patients were partners (in our scale level of cooperation was good) and were able to perform adequately neurological assessment. The average operative time was between 1–5 hours, the most common tumors were gliomas located in eloquent 50% air and 50% in motor areas. Neurological changes were monitored during surgery in 48% of patients. Adverse events attributable to anesthesia were moderate hypercapnia in 16% without other associated complications. One patient (16%) showed a complication transoperative, presented a focal motor seizures, which yielded spontaneously. 84% of patients does't require systemic analgesics in the first 6 hours postoperative
Discussion: The implementation of this technique as well as being innovative in neurosurgical patients turns out to be a safe technique to avoid the continual changes in patient's anesthetic depth and therefore hemodynamic changes to a patient with intracranial hypertension should not be subject to alteration in cerebral autoregulation and the loss of compliance, so we recommend the use of this technique in a proper patient selection in relation to anxiety and preexisting comorbidities for resection of tumors that allow continuous neurologic payment in intra-and postoperative . We saw the same manner as the patients had adequate pain control
Conclusion: Blockade of the scalp in association with midazolam and remifentanil is effective and safe for administration in awake craniotomy for tumor resection in, allowing optimum collaboration and neurological assessment.

Paper No: 273.00

The effects of intrathecal morphine on patient-controlled analgesia morphine consumption, postoperative pain scores and satisfaction in patients undergoing gynecologic oncologic surgery under general anesthesia

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Introduction: Gynecologic cancers represent a major health problem among women(1). Gynecologic oncologic surgery includes a wide variety of surgical procedures. (2). Postoperative pain is a major concern in these patients because it affects multiple systems and induces physiological, immunological, and psychological changes (3)
Objectives: We aimed to compare intrathecal morphine plus patient-controlled analgesia with patient-controlled analgesia alone on morphine consumption, pain relief and patients satisfaction after gynecologic oncologic surgery (GOS) under general anesthesia
Metods: In this double-blinded, randomized, controlled study, 60 women undergoing GOS were allocated to receive either intrathecal morphine 0.3mg (Group 1) or placebo group (Group 2). For the placebo group, the skin was punctured with the dental needle, but it was not advanced beyond the subcutaneous tissue. Monitoring and anesthesia were standardized. Anesthesia was induced with 2 mg.kg-1 of propofol and 2 μg.kg-1 of fentanyl. and 0.6 mg.kg-1. of rocuronium. After tracheal intubation, anesthesia was maintained with a mixture of air (0.5 L/min) and oxygen (0.5 L/min) plus 1 MAC of desflurane On arrival to the postanesthesia care unit (PACU), each patient received a PCA pump programmed to deliver an initial morphine bolus of 0.05 mg.kg-1 at 7 min intervals if pain was more than 60 on the VAS. On discharge from the PACU the pump was reprogrammed for a morphine bolus of 1.5 mg and a 7 min lockout interval and no background infusion. The primary outcome measure was pain relief and patient satisfaction which evaluated by using 100 mm VAS (0-100). Secondary outcomes were morphine consumption, and side effects including nausea, vomiting, pruritus, sedation, fatigue and respiratory depression. Outcome measures were recorded by the same trained nursing staff. at 30 min., 1, 3, 6, 12, 24 and 48 h postoperatively. In a pilot study 20 patients enrolled to GOS under GA consumed an average of 57 ± 21 mg of morphine in the first 48h with PCA pump. To achieve a one-third reduction of opioid consumption with an á error of 0.005 and a power of 90 %, we needed 26 patients in each group.
Results: Fifty six women (28 intrathecal and 28 plasebo) completed the study. No differences were noted with respect to age, weight, height, time of surgery and operation type between the groups. Significant difference was demonstrated in morphine consumption(19.25 ± 13 mg and 54.23 ± 22mg in group 1 and group 2 respectively) and

fatique scores. Satisfaction scores and side effects were similar in both groups. Conclusion In conclusion, 0.3 mg intrathecal morphine in gynecologic oncologic surgery could improve postoperative analgesia and reduce morphine consumption without any serious side effects.

References

1 Jemal A, Siegel R, Xu J, Ward E. Cancer statistics. *CA Cancer J Clin* 2010; **60**: 277–300

2 Chen LM, Weinberg VK, Chen C, Powell B, Chen LL, Chan JK, Burkhardt DH. Perioperative outcomes comparing patient controlled epidural versus intravenous analgesia in gynecologic oncology surgery Gynecologic Oncology **115** (2009) 357–361

3 Kehlet H, Holte K. Effect of postoperative analgesia on surgical outcome. *Br J Anaesth* 2001; **87**: 62–72

Paper No: 275.00

Heterotopic cardiac transplant

Nelson Ruiz and **Claudio Burgos**

Introduction: Heterotopic cardiac transplant is a valid alternative: (i) when the recipient is affected by pulmonary hypertension secondary to his left chronic cardiomyopathy and there is imminent risk of acute right ventricular dysfunction; (ii) in patients with heart disease with healing possibilities and no long lasting mechanic assist devices available; and (iii) when the donor has a mismatch higher than 20%.
Objetives: Describe the surgical procedure and the experience of this department.
Material and Method: We studied eleven patients whose prevalent pathologies were idiopathic dilated cardiomyopathy, hypertensive cardiomyopathy. Sinus rhythm was predominant in most cases. The average waiting time was of 271 days. Eight transplants were elective, one urgent and two emergencies. The technique:
Donor Recipient: Pulmonary Artery Right Atrium Left Atrium Left Atrium Aorta Artery Aorta Artery (end-to-side) Closed Venae Cavae

- Donor LV ejects towards Ao, in its diastole.
- Recipient LV ejects during donor's diastole.

—if this is not the case, there will be blood stasis with arrhythmias, displacement of interventricular septum, thromboembolic phenomenon, cardiac arrest. In order to achieve the above, both hearts were synchronized with 2 dual-chamber pacemakers (DDDR).
Pacemaker-1: ABEE connected to recipient's RA VBEE connected to donor's RA
Pacemaker-2: ABEE connected to recipient's RV VBEE connected to donor's LV
Another option is using one pacemaker (DDD). Pacemaker-1: ABEE connected to recipient's RV VBEE connected to donor's LV
—with this we are able to: Simplify synchronization and AV interval programming Use recipient's sinus node to manage both hearts Improve ejection times Reduce costs Control through hemodynamics and transoesophageal echocardiogram
Results: Of eleven transplants there were 2 deaths – one due to hepatopathy because of alcoholism and one due to acute vascular rejection.
Discussion: The heterotopic cardiac transplant has some difficulties such as incorrect synchrony if donor's heart rate is higher than recipient's one; supraventricular arrhythmias of recipient's or donor's heart. When choosing one pacemaker, the donor's heart, whose sinus node was electrocoagulated, allows the native heart to achieve synchrony at the ventricular level, generating a physiological synchrony since the autonomous nervous system is preserved and acts on the cardiac rhythm of the recipient's heart.
Conclusion: In the world there are more than 100 people with two hearts. Our experience, the only one in Latin America, shows that heterotopic cardiac Tx is a valid therapy when there is more than 10% donor/recipient mismatch or severe pulmonary vascular resistance.

Paper No: 288.00

Perioperative blood glucose level in non diabetic patients undergoing on pump versus off pump coronary artery bypass grafting

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Background: Hyperglycemia during cardiac surgery is associated with poor outcomes, more complications and increased mortality not only in diabetic patients but also in patients who are not previously diagnosed with diabetes. The purpose of this study is to compare perioperative blood glucose level in off-pump CABG versus on pump CABG in non diabetic patients undergoing coronary artery bypass grafting.
Methods: One hundred fifty consecutive patients aged 40 to 65 years old, ASA class II or III, ejection fraction 40% or more were enrolled. One hundred enrollees went through on pump cardiac surgery whereas fifty enrollees were operated without cardiopulmonary bypass. Blood glucose level was recorded six times; before induction of anesthesia, after anesthesia induction, before grafting, after grafting, 30 minutes after protamine administration and 1st post operative hour. Statistical analysis was performed with SPSS software version 15(Chicago, IL, USA)
Results: Both groups showed ascending trend in perioperative blood glucose level but there was no significant difference between them except for post grafting blood glucose($p=0.02$). There was an increasing pattern of hyperglycemia from intra operative period (about 13%) to post operative period (up to 90%) in both on pump and off pump

groups but no significant difference was seen between two groups. ($p>0.05$)
Conclusion: It would be wise to attend to the matter of glycemic control particularly in post grafting phase and post operative phase with specific attention to patients undergoing cardiopulmonary bypass. Key words: cardiopulmonary bypass; cardiac surgery; on pump; off pump

References

1 Prasad AA, Kline SM, Schuler HG, Sukernik MR. Clinical and Laboratory Correlates of Excessive and Persistent Blood Glucose Elevation During Cardiac Surgery in Nondiabetic Patients: A Retrospective Study. *Journal of Cardiothoracic and Vascular Anesthesia*2007; **21**(6):843-6.
2 Gandhi GY, Nuttall GA, Abel MD, Mullany CJ, Schaff HV, Williams BA, *et al.* Intraoperative hyperglycemia and perioperative outcomes in cardiac surgery patients. *Mayo Clinic Proceedings. [Article]*. 2005 Jul; **80**(7):862–6.
3 Doenst T, Wijeysundera D, Karkouti K, Zechner C, Maganti M, Rao V, *et al.* Hyperglycemia during cardiopulmonary bypass is an independent risk factor for mortality in patients undergoing cardiac surgery. *Journal of Thoracic and Cardiovascular Surgery*2005; **130**(4):1144.e1–.e8.
4 Estrada CA, Young JA, Nifong LW, Chitwood WR Jr. Outcomes and perioperative hyperglycemia in patients with or without diabetes mellitus undergoing coronary artery bypass grafting. *Ann Thorac Surg*2003 May;**75**(5):1392–9.
5 Carvalho G, Moore A, Qizilbash B, Lachapelle K, Schricker T. Maintenance of normoglycemia during cardiac surgery. *Anesth Analg. [Article]*. 2004 Aug;**99**(2):319–24.
6 Rogers SO Jr., Zinner MJ. The role of perioperative hyperglycemia in postoperative infections. *Adv Surg*2009; **43**:103–9.
7 Ouattara A, Lecomte P, Le Manach Y, Landi M, Jacqueminet S, Platonov I, *et al.* Poor intraoperative blood glucose control is associated with a worsened hospital outcome after cardiac surgery in diabetic patients. *Anesthesiology*2005; **103**(4):687–94.
8 Pojar M, Mand'ak J, Cibicek N, Lonsky V, Dominik J, Palicka V, *et al.* Peripheral tissue metabolism during off-pump versus on-pump coronary artery bypass graft surgery: the microdialysis study. *Eur J Cardiothorac Surg*2008 May; **33**(5):899-905.
9 Lee JH, Capdeville M, Marsh D, Abdelhady K, Poostizadeh A, Murrell H. Earlier recovery with beating-heart surgery: a comparison of 300 patients undergoing conventional versus off-pump coronary artery bypass graft surgery. *J Cardiothorac Vasc Anesth*2002 Apr; **16**(2):139-43.

Paper No: 293.00

Comparison Between 40:2, 15:2 Versus 30:2 Compression :Ventilation Ratio on CPR outcome

Ebrahim Nasiri, Yousef Mortazavi and Reza Nasiri

Introduction: Aim of this study was to compare the effect of a 40:2, 15:2 versus 30:2 Compression: Ventilation(C:V) ratio on rate of Chest Compression(CC), rescuer fatigue and satisfaction. We measured the BP and pulse.
Material and Methods: 53 persons performed BLS and CPR using C: V of 15:2, 30:2, 40:2 on a adult resuscitation lardal manikin for two minutes. Two researcher measured the above mentioned variables. Data were analyzed by ANOVA, student's t-test or Mann-Whitney U test between groups. The value of $P<0.05$ was considered as significant. The results revealed fatigue after 2 minutes and satisfaction from the performed technique in the groups differed ($p<0.05$).
Results: Number of breathing in two minutes was 8.8 ± 4.7(1-24). Total cardiac massage in two minutes in the study groups was 131.7 ± 40.6 (20-265), of this number in130.6 ± 40.5 was done correctly. The number of compression per two minutes increased with C: V ratio of 40:2 than to other C: V ratio. Most of participants (71.7%) prefer using 30:2 ratio to achieve the primary goal of Cardiopulmonary Resuscitation (CPR). PR and systolic, diastolic BP of rescuers before and two minutes after resuscitation had insignificant difference ($P<0.001$), and SBP differed between groups ($P<0.04$).
Conclusion: Although the rescuers prefer to perform the C: V ratio 30:2, but number of CC is less than standard recommended by AHA. Alternative C: V ratio of 40:2 methods, is equal to the AHA recommended 80 compressions/minute, and also highest number of CC is done in 2 minutes, While, in the other methods is less than the recommended number.

Paper No: 298.00

Fast track protocol of extubation after cardiac operations with cardiopulmonary bypass: the role of sugammadex

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Objective: Evaluation of sugammadex effectiveness in fast track extubation protocol (60-90 min) of patients undergoing cardiac surgery with cardiopulmonary bypass (CPB).
Materials and methods: From February to August 2011 twenty patients, 12 males and 8 females undergoing cardiac surgery with CPB were enrolled in the fast track extubation protocol. The age ranged from 25 to 61 years (mean age $49,4\pm5,3$), and mean weigh was $74,3\pm6,7$ kg. Eighteen patients underwent valve repair/ replacement surgery and 2 - combined valve replacement and CABG. Mean CPB time was $78,9\pm10,4$ (50-129) min and aortic cross clamping was $62,1\pm8,2$ (38-111) min. All patients had anesthesia induced with midazolam (0,1mg/kg), propofol (1,0–1,5mg/kg) and rocuronium 1,0 mg/kg. For maintenance of anesthesia before, during, and after bypass, all patients received a continuous infusion of rocuronium (0,4mg/kg/hr), 12 received

sevoflurane and 8 propofol. Analgesia was maintained with fentanyl (3,1 ± 0,2mcg/kg/h). At the end of surgery 4 mg/kg sugammadex was administered for reversal of rocuronium. Central hemodynamic parameters, level of neuromuscular blockade (TOF), BIS index, recovery of spontaneous breathing and time to ensure full recovery before extubation were monitored.

Results: Throughout surgery mean TOF level was 0,17 ± 0,03 (0,1-0,2). BIS index was 32 ± 6 (30-40%) during surgery and gradually increased after stopping sevoflurane or propofol and reached 67 ± 3 (65-70%) at end of surgery. After sugammadex administration patients regained consciousness, breathed spontaneously, were alert, central hemodynamic parameters were stable and TOF increased to 0,9 within 5 minutes. All patients were extubated in the operating room within 57,0 ± 10,4 (30–120) minutes after injecting sugammadex; they were transferred to ICU with good spontaneous breathing, stable cardiac function, and good biochemical analyses. Mean ICU stay was 18 hours, one patient needed a pacemaker and stayed in ICU for 48 hours.

Conclusion: Administration of sugammadex was effective in fast track extubation of patients undergoing cardiac surgery with cardiopulmonary bypass.

Paper No: 336.00

Effects of preemptive epidural analgesia on perioperative pain and cytokine production in patients undergoing colorectal surgery

Vicente Pedroviejo and **Rosa PeÑa**

Preemptive analgesia is a pain management technique in which analgesic treatment begins prior to the surgical incision, in order to lessen postoperative pain and reduce the incidence of hyperalgesia and allodynia after surgery. Evidence of preemptive analgesia in animals is convincing, although in human studies remain controversial.

To investigate whether preemptive epidural analgesia (PreEA) may reduce postoperative visual analog scale (VAS) scores and total analgesic requirements, and attenuate the perioperative cytokine production.

Patients hospitalized for elective colorectal surgery are randomly assigned to one of the two pain management groups: PostEA or preemptive epidural analgesia followed by PostEA. Postoperative pain and total analgesic requirements are recorded. Blood samples are collected before surgery and 6, 24 and 48 hours following surgery. Perioperative production of interleukins (IL)-1beta, tumor necrosis factor alfa, IL-6, IL-1 receptor antagonist and reactive C protein are assessed.

Patients in the PreEA group exhibited a longer time to first intravenous morphine, but similar postoperative morphine. Pain scores revealed very similar trends. IL-6 levels in PreEA group were 0,29 ± 0,06 vs 0,04 ± 0,01 pg/ml, 45,62 ± 9,37 vs 46,32 ± 9,18 pg/ml, 24,14 ± 5,32 vs 13,32 ± 3,33 pg/ml and 16,12 ± 3,60 vs 5,23 ± 1,31 pg/ml at 0, 6, 24 and 48 h after surgery, respectively. IL-1ra levels in PreEA group were 223,09 ± 50,0 vs 168,12 ± 41,0 pg/ml, 1598,20 ± 321 vs 1459,11 ± 211 pg/ml, 673,23 ± 117 vs 586,42 ± 115 pg/ml and 465,38 ± 104 vs 458,91 ± 71 pg/ml at 0, 6, 24 and 48 h after surgery, respectively. RCP levels in PreEA group were 12,08 ± 2,10 vs 12,22 ± 2,26 pg/ml, 11,85 ± 1,95 vs 15,10 ± 2,96 pg/ml, 88,91 ± 19,67 vs 90,44 ± 8,64 pg/ml and 127,88 ± 18,52 vs 126,11 ± 22,78 pg/ml at 0, 6, 24 and 48 h after surgery, respectively. TNF? levels in PreEA group were 22,30 ± 5,58 vs 18,78 ± 5,02 pg/ml, 31,89 ± 7,97 vs 10,14 ± 2,71 pg/ml, 17,66 ± 4,41 vs 10,40 ± 2,78 pg/ml and 20,69 ± 5,17 vs 10,19 ± 2,73 pg/ml at 0, 6, 24 and 48 h after surgery, respectively. IL-1? levels in PreEA group were 0,23 ± 0,05 vs 0,08 ± 0,02 pg/ml, 0,00 vs 0,50 ± 0,13 pg/ml, 0,00 vs 0,50 ± 0,13 pg/ml and 0,15 ± 0,04 vs 0,13 ± 0,03 pg/ml at 0, 6, 24 and 48 h after surgery, respectively.

Conclusions: PreEA prolongs the time to first intravenous morphine use but does not produce either a morphine-sparing effect or less postoperative pain. PreEA is not able to decrease perioperative cytokine response. In conclusion, PreEA is not able to decrease subjective and objective parameters measured in this study. Thus PreEA may not be useful to attenuate surgery-induced systemic inflammatory response after colonic surgery.

References

1 Katz J, McCartney CJL. Current status of preemptive analgesia. *Curr Opin Anaesthesiol* 2002; **15**: 435–41

2 Møiniche S, Kehlet H, Dahl JB. A qualitative and quantitative systematic review of preemptive analgesia for postoperative pain relief: the role of timing of analgesia. *Anesthesiology* 2002; **96**: 725–41

3 Lavand'homme P, De Kock M, Waterloos H. Intraoperative epidural analgesia combined with ketamine provides effective preventive analgesia in patients undergoing major digestive surgery. *Anesthesiology* 2005; **103**: 813–20

4 Kissin I. Preemptive analgesia. *Anesthesiology* 2000; **93**: 1138–43

5 Pogatki-Zahn EM, Zahn PK. From preemptive to preventive analgesia. *Curr Opin Anaesthesiol* 2006; **19**: 551–5

6 Ong CK, Lirk P, Seymour RA, Jenkins BJ. The efficacy of preemptive analgesia for acute postoperative pain management: a meta-analysis. *Anesth Analg* 2005; **100**: 757–73

Paper No: 374.00

Concept of total myocardial protection by sevoflurane during cardiac surgery with cardiopulmonary bypass: preliminary results

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Introduction: The protective properties of sevoflurane on myocardium have been attributed to anesthetic pre- and postconditioning. Clinically this effect is enhanced when sevoflurane is administered throughout the surgical procedure (De Hert et al., 2002; De Hert et al., 2004; Cromheecke S. et al., 2006). When the aorta is cross-clamped coronary blood flow ceases and sevoflurane cannot be delivered to myocardium. To address this problem we propose the use of ante- or retrograde coronary perfusion. In some studies sevoflurane 2% was added to the cardioplegic solution (Nader N.D. et al., 2004; Nader N.D. et al., 2006) but there were no conclusive data concerning its effect on the hypothermic myocardium.
Objectives: To evaluate the effectiveness of total myocardial protection by sevoflurane (TSMP) during cardiac surgery with cardiopulmonary bypass (CPB).
Material and Methods: After ethical approval and written informed consent TSMP was used in 5 patients undergoing valve surgery (replacement of mitral valve – 2; replacement of aortic valve -1; mitral and tricuspid valves repair -2) with normothermic CPB from July to August 2011. The study included 2 males and 3 females aged 36 to 62 years (mean 47.4 $\pm$ 5.9) with an ejection fraction ranging from 20 to 40%. TSMP was achieved by administering sevoflurane throughout whole procedure: for induction and maintenance of anesthesia in pre- and post bypass periods. During CPB sevoflurane was administered via a vaporizer which was connected to the oxygenator gas supply line. All surgeries were performed on "the beating heart" with constant antegrade or retrograde coronary perfusion. For coronary perfusion blood enriched with sevoflurane (2-3 vol %) from oxygenator was used thus allowing constant supply of sevoflurane to the myocardium even during aortic cross clamping. Mean CPB time was 68 $\pm$ 14 min. and aorta cross clamping was 53 $\pm$ 16 minutes.
Results: Dobutamine (2-3 mcg/kg/min) was used in 2 patients. All patients underwent early extubation in OR before transfer to ICU. The post operative levels of CK-MB were lower than in non TSMP group. Three hours after surgery CK-MB level in TSMP group was lower by 38,1% and 13,3%; 8 hours after surgery lower by 45,9% and 27,7%; 24 hours after surgery lower by 42,0% and 32,6% and lower by 29,7% and 17,4% 48 hours after surgery compared to propofol(12 patients) and sevoflurane(11 patients) groups respectively. Normalization of CK-MB level was registered earlier in TSMP group (within 24 hours), in propofol (more than 48 hours) and sevoflurane (in 48 hours) groups.
Conclusion: Our technique improved myocardial protection in high risk cardiac patients but larger prospective randomized trials are needed to definitively assess the cardioprotective effects of this technique.

References

1 Stefan G, De Hert, Pieter W, ten Broecke, Els Mertens, *et al.* Sevoflurane but Not Propofol Preserves Myocardial Function in Coronary Surgery Patients// *Anesthesiology*, **V 97**, No 1, Jul 2002
2 Stefan G, De Hert, Philippe J, Van der Linden, Stefanie Cromheecke *et al.* Cardioprotective Properties of Sevoflurane in Patients Undergoing Coronary Surgery with Cardiopulmonary Bypass Are Related to the Modalities of Its Administration// *Anesthesiology* 2004; **101**: 299–310
3 Stefanie Cromheecke, Veronik Pepermans, Ellen Hendrickx, *et al.* Cardioprotective Properties of Sevoflurane in Patients Undergoing Aortic Valve Replacement with Cardiopulmonary Bypass// *Anesth Analg* 2006; **103**:289–96
4 Nader ND, Li CM, Khadra WZ, Reedy R, Panos AL Anesthetic myocardial protection with sevoflarane//jJ. Cardiothor. Vasc.Anesth.-2004.-Vol.**18**. P.269–274.
5 Nader ND, Karamanoukian HL, Reedy RL, Salehpour F, Knight PR Inclusion of sevoflurane in cardioplegia reduces neutrophil activity during cardiopulmonary bypass// *J. Cardiothor.Vasc.Anesth.*-2006.-Vol.**20.-** P.57–62.

Paper No: 377.00

Cardiac surgery in patients with heparin-induced thombocytopenia

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Introduction: Heparin induced thrombocytopenia (HIT) is coagulation disorder in patients treated by nonfractioned heparin or (rear) by low molecular weight heparine (LMWH). In the most patients (pts) nonimmune forme of HIT occurs, characterised by a mild decrease in in the platelet count and is not harmful. The second type, immune-mediated HIT, occures much less frequently, thrombocytopenia is the first clinical sighn followed by reduced number of platelets, less then 100 000 mm3 or reduced number more then 50%. Sometimes, reduction of platelets number might be less (30-40%). In 20–50 % of pts thrombocytopenia is severe and often associated with thrombo-embolic and haemorrhagic events. Usually, 5–15 days after the first administration of heparin, immune-mediated HIT occures. Heparin forms antigen complex with pletlet factor 4 (PF4) that is released by platelets. Specific antibodies, formed against complex heparin-PF4, bind to this complex and destroy the platelets. The desruption of platelets, stimulate the formation of new blood clots with consequence of deep vein thrombosis, pulmonary embolism, or even myocardial infarction or stroke.
Objectives: HIT might be life-threatening in patients undergoing open heart surgery, due to thromboembolic events, thrombocytopenia and bleeding. If cardiac surgery with

cardiopulmonary bypass (CPB) is necessary, anticoagulation therapy will be based on usage of danaparoid or direct thrombin inhibitors.

Methods: Female patient was switched from per oral anticoagulant therapy to low molecular heparin therapy preparing for reredo mitral valve replacement due to endocarditis and artificial valve thrombosis. In next 10 days, thrombocytopenia was obvious (Tr 302 000 mm3 to 11 000 mm3), and diagnoses of HIT were done. Anticoagulant therapy was continued with danaparoid, 750 IU/12 h sc. During the surgery, reredo mitral valve replacement and aortocoronary bypass on anterior descending coronary artery, blood salvage technique with r-hirudin(intravenous bolus 0,4 mg/kg, in CPB prajming solution 0,4mg/kg and continuous infusion (0,15 mg/kg/h) during cardiopulmonary bypass was used.

Results: Active coagulation time were monitored, without any sign of micro thrombosis in circuit. Postoperatively, per oral anticoagulation therapy was initiated with prolonged postoperative treatment due to basic disease, endocarditis. Patient was discharged from hospital on 21-st postoperative day without any complication.

Conclusions: Intraoperative anticoagulation strategy was based on efficient and short-life r-herudin supported by aprotinin, fresh frozen plasma and platelets transfusion.

References

1 Arepally MG, Ortel LT. Heparin-indiced thrombocytopenia. *N Engl J Med* 2006; **355**:809-17.

2 Greinacher A, Volpel H, Janssens U, *et al.* Recombinant hirudin (lepirudin) provides safe and effective anticoagulation in patients with heparin-induced thrombocytopenia: a prospective study. *Circulation* 1999; **99**:73–80.

3 Singer RL, Mannion JD, Bauer TL, Armenti FR, Edie RN. Complications from heparin-induced thrombocytopenia in patients undergoing cardiopulmonary bypass. *Chest* 1993; **104**:1436–40.

Paper No: 384.00

Pre-operative fasting policies: are they clear enough?

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Introduction: Pre-operative fasting is fundamental to the practice of anaesthesia and surgery. However despite the existence of fasting guidelines, inconsistences can be observed in daily practice. This may reflect practitioner preference or incompleteness of the guidelines themselves.

Objectives: To evaluate health professionals' understanding of existing pre-operative fasting guidelines within a London teaching hospital, where anecdotally opinions differ greatly. In addition, to establish if more robust guidelines are needed that would lead to uniformity in practice.

Methods: A two-page questionnaire was distributed to anaesthetists, surgeons, nursing and theatre staff at a UK teaching hospital (n=88).

Results: At two hours pre-operatively, the percentage of respondents that found it acceptable to consume black coffee, carbonated water, vodka and methadone were: 43.2%, 36.4%, 12.5% and 29.5% respectively. 29.5% of respondents consider chewing gum acceptable up to two hours before surgery. 49% of respondents thought it safe to allow 30ml or more of fluid to ingest medication prior to surgery. 60.2% of respondents would allow medication one hour prior to surgery, but at 20 min only 24.1% found this acceptable. A quarter of respondents would allow a 'small glass of water' in an otherwise starved patient, one hour prior to surgery. The rationale given by respondents for their answers was equally split between clinical experience, national and local guidelines.

Conclusions: Despite more than four million patients undergoing surgery in the UK every year, there remains ambiguity and uncertainty among peri-operative healthcare professionals in relation to pre-operative fasting. This extends to the rationale for fasting and controversy surrounding the definition of a 'clear fluid'. There is a paucity of evidence to determine optimal practice and this audit suggests a discrepancy between practice, opinion and published guidelines [1]. For example, in the most recent UK guidelines, chewing gum is allowed up to two hours before surgery rather than six [2]. However, this differs widely to the results of our survey, which demonstrates a lack of awareness in frontline staff of new guidelines, which promote the benefits of reduced fasting times such as increased patient comfort and hydration. In addition, there are national recommendations that each hospital should develop local guidelines. This audit not only highlights the need for more research into this area, but also that health professionals need to be aware that the central tenet of anaethesia: starvation, can be subject to change.

References

1 Smith I, Kranke P, Murat I, Smith A, O?Sullivan G, Sreide E, *et al.* Perioperative fasting in adults and children. *European Journal of Anaesthesiology* 2011; **28**(8):556-69.

2 AAGBI. Pre-operative assessment and preparation. The role of the anaesthetist. Association of Anaesthetists of Great Britain and Ireland 2010; Available from: http://www.aagbi.org/sites/default/files/preop2010.pdf. Accessed August 2011

Paper No: 413.00

Anaesthetic management of a ploytrauma case with pulmonary thrombus

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Introduction: There is high incidence of venous thromboembolism, comprising of deep vein thrombosis (DVT)and pulmonary embolism(PE), in trauma patients. 1 These patients, on prophylactic or therapeutic doses of anticoagulants may present for surgery. 2 General or regional anaesthesia may be considered depending on the type and urgency of surgery and degree of anticoagulation. The anaesthesiologist must be aware with the latest developments of methods and drugs used in the prevention and management of venous thromboembolism and their implications in the conduct of anaesthesia. We describe anaesthetic management of a polytrauma patient having pulmonary thrombus who was scheduled to undergo surgery for hip fracture.
Case Report: A 65 -year-old male having multiple trauma (B/L fracture of body of mandible, B/L shaft of humerus, left multiple ribs fracture, clavicle and scapula fracture, B/L trochanter fracture,B/L inferior rami fracture) was scheduled to undergo dynamic hip screw fixation for B/L trochanter fracture. Patient had left sided pneumothorax for which a chest drain had been inserted in Accident & Emergency department. Colour doppler findings were echogenic thrombus in left internal iliac and common femoral vein. Left superficial, deep femoral, internal iliac veins were dilated and non compressible showing no blood flow; left posterior tibial vein was compressible in distal part showing blood flow. Right sided lower limb vessels had no sign of DVT. A combined spinal epidural anaesthesic (CSEA) involving needle through needle technique was considered for proposed surgical procedure. Patient's hemodynamic parameters were stable follow¬ing CSEA. Surgery lasted for 2 hours. The intraoperative period remained uneventful. Patient was shifted to ward after observing in recovery room for 1 hour. The epidural catheter was removed third day postoperatively.
Results: The patient had an uneventful postoperative course in the orthopaedics ward and was discharged home after three weeks.

References

1 Stein PD, Beemath A, Olson RE. Trends in the incidence of pulmonary embolism and deep venous thrombosis in hospitalized patients. *Am J Cardiol* 2005; **95**: 1525–6.
2 Horlocker TT, Wedel DJ, Benzon H, *et al.* Regional anesthesia in the anticoagulated patient: Defining the risks. *Reg Anesth Pain Med* 2004; **29**: 1.
3 Warwick D, Williams MH, Bannister GC. Death and thromboembolic disease after total hip replacement. A series of 1162 cases with no routine chemical prophylaxis. *J Bone Joint Surg Br*. Jan 1995; **77**(1): 6–10.
4 Caprini JA, Arcelus JI, Maksimovic D, *et al.* Thrombosis prophylaxis in orthopedic surgery: current clinical considerations. *J South Orthop Assoc. Winter* 2002; **11**(4): 190–6

Paper No: 442.00

A case that concurrent renal and cardiac transplantation was applied

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Introduction: There is no guideline for the concurrent renal and cardiac transplantation or cardiac transplantation only in patients with cardiac and renal insufficiencies at the same time. Presence of renal insufficiency is accompanied by an increased risk of mortality in patients with cardiac transplants.
Case: The thirty-four year-old male had known asthma and high blood pressure in his medical history. He was diagnosed with renal insufficiency secondary to HT 3 years ago, and the ECHO study in the same period revealed medium-level pulmonary hypertension with second degree tricuspid regurgitation and PAB measurement as 48 mmHg. He had respiratory arrest twice during the follow-up, and cardiac arrest related to ventricular fibrillation once and was resuscitated with CPR. In the ECHO, EF was 40%, PAB was 69.76 mmHg, had 3° mitral regurgitation and 2° tricuspid regurgitation. He was taken to the operation room for renal and cardiac transplantation from a cadaver. The findings of the patient were as follows: BP: 84/52, Heart rate: 112, SpO2 :100, and he the anesthesia induction was made using etomidate 0.2mg/kg, vecuronium 0.15mg/kg and fentanyl 10mcg/kg; later the anesthesia was maintained with using a mixture of 50% air-O2 and 1 It/min sevofularane and remifentanyl infusion. The pulmonary artery was catheterized. Cardiac transplantation was carried out after median sternotomy with medium-level hypothermia and bicaval anastomosis method. Intra-aortic balloon pump was applied before terminating the bypass. The cardiopulmonary bypass was terminated after ensuring the hemodynamic stabilization. The kidney was transplanted to the right iliac fossa from the cadaver. 1 unit of RBC, 2 bags of platelets and 4 units of TDP replaced throughout the operation. He was referred to cardiovascular surgery ICU, where he was followed up in the ICU for one month. He was extubated in Day 6 postoperatively, and then was discharged fifteen days later.
Discussion: There are so few studies on the concurrent renal and cardiac transplantations. Ensuring the perioperative hemodynamic stability and small amounts of blood loss are the main targets of long-term renal functions in kidney transplantation cases. Likewise, in our case 1 unit of RBC was replaced throughout the operation. The renal functions are among the determining factors of morbidity and mortality in open cardiac surgeries. In our patient who had cardiac and renal insufficiencies, kidney and heart were transplanted successfully in the same operation.

Reference

1 Hsu RB, *et al.* Effect of simultaneous kidney transplantation on heart-transplantation outcome in recipients with preoperative renal dysfunction. *Eur J Cardiothorac Surg.* 2010 Jan; **37**(1): 68–73. Epub 2009 Jul 24.

Paper No: 476.00

Does glycated hemoglobin (HbA1C) predict adverse outcome following cardiac surgery regardless the diabetic state?

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Introduction: Glycated hemoglobin (HbA1c)is well known for its role in evaluating diabetic patients blood glucose control during last two or three month. However, there are much debates on diabetes as a risk factor for coronary artery disease and/ or adverse outcome after coronary artery bypass surgery (CABG)
Objectives: Much attention has been focused on the role of HbA1c in prediction of events after cardiac surgery. To establish the relationship between HbA1c and adverse short-term outcome in both diabetics and non-diabetics patients undergoing CABG, we conducted the present study.
Methods: A prospective study was conducted on 570 patients (233 diabetic patients and 337 non-diabetics) who underwent isolated CABG at Tehran Heart Center. Preoperative and intraoperative clinical and laboratory findings and also postoperative short-term outcome data were collected. HbA1c levels were measured immediately before operation in all patients. HbA1c measures were categorized in for groups: sub optimal(6-1-7%), High (7.1-8%), very high (>8%).
Results: It was an overall relationship between the frequency of diabetes mellitus and HbA1c level; however the frequency of diabetics (44.7%) and non-diabetics (55.3%) was nearly similar in suboptimal HbA1c levels (6.1-7%). A linear trend was found between elevated HbA1c level with a higher prevalence of in-hospital morbidity and postoperative arrhythmias. Although significant differences in morbidity and total LOS were observed between diabetic and non-diabetic groups with the plasma HbA1c levels more than 7%, these parameters were similar between the two groups with suboptimal HbA1c levels. In a multivariable analysis, advanced age ($P<0.001$), plasma HbA1c (6.1–7%) ($P=0.002$), were independent predictors of short-term adverse outcome regardless the diabetic state.
Conclusion: Suboptimal HbA1c level can be associated with an increased early morbidity rate following CABG in all patients regardless the diabetic state.

Paper No: 483.00

Report: Jehovah's Witness in Cardio Surgery

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Introduction: The authors report the case of elective cardio surgery performed on Jehovah â€™s Witness(JW).
Objectives: From the January 1997 to July 2011 there were only 11 JW patients in our hospital. Even the number of them is small, we are only hospital in our state, if we exclude pediatric patients, where cardio and vascular surgery were performed on JW.
Method and results: A 68 years old male JW, with coronary disease, was admitted for progressive chest pain and dyspnea. His medical history included two myocardial infarctions and percutaneous coronary intervention with implantation stent in RIA. He had experienced two cerebrovascular insults during the past several years. Ejection fraction was estimated as 35%. High dose erythropoietin therapy and iron supplement started two weeks before surgery. His starting hemoglobin level was 14,7 gr/dl, hematocrit 44,7, platelets count 225,000/uL and prothrombin time, activated partial thromboplastin time and international normalized ratio were normal. Anesthesia and surgical technique were standard. Intraoperative blood conservation was performed with Cell Saver and ultrafiltration, taking care of continues circuit of salvage cells with the body-which is the main condition for using autologus blood in JW. Tranexamic acid was given to patient by the existing protocol in cardiac surgery (high dose 30mg/kg). Coagulation status was followed with the ROTEM Analyser and Multiplate platelet function analysis prior heparin and after protamin application, which showed normal coagulation. The operation proceeded uneventfully . The fourfold aorto coronarius bypass was made. There was no need for inotropic support and the hemoglobin on the end of surgery was 9,8 gr/dL. Two hours after initial surgery there was continued mediastinal bleeding in total amount of 700ml and the surgeon decided to reopen the patient and explore the surgical site. No bleeding was identified, and complete hemostasis was verified before reclosure. Patient was sent out of ICU on the 1st postoperative day. The last, 3rd dose of erythropoietin he received on the same day. The patient experienced no postoperative complications, no neurological or renal sequelae were noted. He was discharged on the 11th postoperative day .
Conclusion: Patient blood management leads to excellent outcome in JW patients and should be the standard care for any patient,who can't get blood transfusion because of different reason(religion,technical or absence of corresponding blood group),even if there is strong medical indication for blood transfusion.

Paper No: 496.00

Use of nonparametric statistic to identification of predictors of pain in office diagnostic hysteroscopy without anaesthesia

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Introduction: Hysteroscopy is an endoscopic procedure to approach the uterine cavity can be performed with or without anaesthesia. When performed without anesthesia, the test is eventually suspended due to the pain. In these cases, the procedure is rescheduled to be done with anaesthesia.
Objective: Identifying predictors of pain for women who meet unfavorable conditions to be identified and have their procedures performed under anaesthesia.
Methods: A total of 108 patients who underwent diagnostic hysteroscopy without anaesthesia were evaluated in two stages: (1) before the exam, when we did an anamnesis directed and (2) immediately after the exam, when we evaluated the intensity of pain. The pain reported by pacients during the procedure was scaled using a numerical scale (score of 0 to 10) directly proportional to the discomfort experienced by each individual. Nonparametric statistic analysis was performed in order to identify variables significantly associated with pain, in other words, potential predictors.
Results: Patients were grouped and compared according to dichotomized variables (Mann Whitney test). The significances were diabetes (0.303), hypertension (0.981), smoking (0.022), anxiety (0.110), curettage (0.084), cesarean (0.509), chronic pelvic pain (0.834), dysmenorrhoea (0.272), dyspareunia (0.586), in the presence of pain (0.666), cramps referred in those days of the exam (0.744) and vaginal delivery (0.138). Only smoking was associated with pain, the group of smokers showed significantly more intense pain. The correlation coefficients of the variables sortable with the intensity of pain (Spearman) and their significance were: age (−0.150; 0.875), weight (0.112; 0.271), height (−0.090; 0.388), education (0.006; 0.955), time (0.028; 0.776), body mass index (0.164, 0.126), number of pregnancies (−0.150; 0.124), parturition (−0.153, 0.115), number of abortions (−0.007; 0.941) and number of vaginal deliveries (−0.176; 0.070).
Conclusion: Smoking was significantly associated with pain and this condition will be evaluated further in a multivariate statistical model.

Paper No: 511.00

Discriminative powewr of euroscore in predicting morbidity and prolonged hospital stay in an iranian sample population

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Introduction: EuroSCORE as a simple and rigorous risk stratification model is commonly used in predicting early and late outcome of cardiac surgery across the world.
Objectives: We aimed to assess discriminative power of the EuroSCORE model to predict postoperative morbidity and total prolonged length of stay in hospital (LOS) and ICU stay in an Iranian group of cardiac surgery population.
Methods: The additive EuroSCORE model was applied to 570 patients undergoing isolated coronary artery bypass grafting at Tehran Heart Center during a six month period. Discrimination power of the EuroSCORE model was tested by the area under the receiver operating characteristic (ROC) curve and the calibration by comparing observed and predicted outcomes across the risk spectrum assessed using the Hosmer-Lemeshow goodness of fit test.
Results: An overall morbidity rate was 47.5%. The observed morbidity in high risk patients (EuroSCORE>6) was significantly greater than low risk patients (EuroSCORE?6). Furthermore, 51.2% of the patients had LOS beyond 14 days. Both prolonged LOS (>14 days) and prolonged ICU stay (>72 hours) were more prevalent in high risk group than those in low risk group. The discriminative power of EuroSCORE in predicting morbidity, prolonged LOS, and ICU stay was poor with area under the ROC curve of 0.617, 0.598 and 0.581, respectively. However, this risk score showed good calibrations for morbidity (p=0.119), prolonged LOS (p=0.958) and prolonged ICU stay (p=0.620).
Conclusion: EuroSCORE provided inappropriate discrimination in predicting early morbidity and prolonged LOS and ICU stay in our study population. Creation of a new model, which accurately predicts outcomes in Iranian CABG patients, is recommended.

Paper No: 517.00

Has Trendelenburg positioning effect about Intraocular Pressure during laparoscopy?

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Introduction: Intraocular pressure (IOP) increases during changes in body position. During laparoscopic surgery, patients are placed in various positions and the abdominal cavity is filled with carbon dioxide (CO2) gas. The literature say that Trendelenburg position increases intraocular pressure (IOP); however, the magnitude of this increase is

unknown, particularly during long procedures and in combination with carbon dioxide (CO2) insufflation during laparoscopy.
Objectives: The aim of this study was to compare the IOP changes in patients undergoing laparoscopic prostatectomy (Trendelenburg position) versus laparscopic nephrectomy (lateral decubit position).
Methods: in this prospective study we measured IOP using a Tono-pen in 50 patients: 25 patients (group 1) laparoscopic nephrectomy and 25 patients (group 2) laparoscpic prostatectomy. The IOP was measured anesthetized and supine (T0= baseline); anesthetized after insufflation of the abdomen with carbone dioxide (T1); after 1 hour (T2) and anesthetized supine before awakening (T3).
Results: There were no significant differences in terms of age, BMI, intraperitoneal pressure. Group 1: IOP (mmHg)in laparoscopic nephrectomy was in left eye (T0)9.14; (T1)20.28; (T2)22.09; (T3) 17.80 and in right eye (T0)10.52; (T1)21.19; (T2)22.90; (T3) 17.95 Group 2: IOP (mmHg)in laparoscopic prostatectomy was in left eye (T0)10.33; (T1)22.38; (T2)25.85; (T3)18.57 and in right eye (T0)12.19; (T1)23.38; (T2)26.42; (T3)19.33.
Conclusions: This study shows that IOP increases significantly in anesthestized patients undergoing laparoscpic surgery and the increase is higher in prostatectomy with Trendelenburg positioning. We were able to quantify the changes in IOP throghout the procedure and we conclude that laparscopic surgery reach IOP levels that are comparable with those observed in glaucoma patients.

Paper No: 519.00

Organising an anaesthesia conference in sierra leone

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Introduction: Anaesthesia provision in some West African countries is in crisis due to lack of funding, equipment, suitable drugs and disposables. But also relevant is the lack of medically trained anaesthetists and CPD. In Liberia the service for 3.5 million people is provided only by anaesthetic nurses and in Sierra Leone there are only 4 doctor anaesthetists for a population of 5 million.
Objectives: To organize a 3 day anaesthesia conference in Freetown.
Methods: Contact was made with the country's senior anaesthetist Dr Michael Koroma by phone and email six months in advance and the dates of the conference were agreed. An 8 strong faculty consisting of 5 consultants and three trainees, all UK based, were chosen. Flights were booked. Accommodation was organized on board the M/V Africa Mercy in the port only 10min walk from the conference venue, the Princess Christian Maternity Hospital. Mercy Ships also agreed to provide visas and in country transport. The program was based on workshops preceded by short presentations. 3 main topics were obstetric, paediatric and trauma anaesthesia. Travel expenses of $20/delegate were agreed. Funding was found for lunch. T-shirts and attendances certificates were designed. Projectors were organized.
Results: 79 anaesthesia providers including 20 trainees attended the conference. At registration on day 1 the delegates were asked to write down their name, hospital, position, mobile number and email. A name card, pouch, lanyard, T-shirt, writing pad and a pen were given to each attendee. They were also given a topic for a prize essay to be handed in at the end of the second day. At the end of each day a prize quiz was held with questions based on the topics covered during the workshops. All delegates were encouraged to fill in feedback forms at the end of each day. At the closing ceremony CDs including all the presentations and other useful information were provided for each delegate
Conclusions: The conference seemed to go well and the feedback was generally very positive but it is difficult to measure objectively whether the conference might have any affect at all on standards of anaesthesia. But it was good for anaesthesia providers from all over Sierra Leone to meet, make new friends, establish professional contacts and discuss the similar difficulties they all have in struggling to provide some sort of anaesthesia service for a country which has only recently emerged from 10 years of civil war.

Paper No: 520.00

Blood loss substitution with the 3-fold amount of ringer's lactate is insufficient to maintain normovolemia in humans

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Introduction: Isotonic crystalloids play a central role in perioperative fluid management.1 Isooncotic colloids (e.g. human albumin or hydroxyethyl starch) remain nearly completely intravascular when infused to compensate for acute blood losses.2 Recent data were interpreted to indicate a comparable intravascular volume effect for crystalloids, challenging the occasionally suggested advantage of using colloids to treat hypovolemia.3 General physiological knowledge and clinical experience, however, suggest otherwise.
Objectives: To show the short term intravascular volume effect of crystalloids by direct blood volume measurements.
Methods: In a prospective clinical trial, double-tracer blood volume measurements were performed before and after

intended normovolemic hemodilution in 10 female adults, simultaneously substituting the 3-fold amount of withdrawn blood with ringer's lactate. Any originated deficits were substituted with half the volume of 20% human albumin, followed by a further assessment of blood volume.

Results: 1,097 ± 285 ml of whole blood were withdrawn (641 ± 155 ml/m2 body surface area) and simultaneously replaced by 3,430 ± 806 ml of ringer's lactate. All patients showed a significant decrease in blood volume after hemodilution (−459 ± 185 ml; p<0•05) which did not involve relevant hemodynamical changes, and a significant increase in interstitial water content (+2,157 ± 606 ml; p<0.05). The volume effect of ringer's lactate was 17 ± 10%. The infusion of 245 ± 64 ml of 20% human albumin in this situation restored blood volume back to baseline values, the volume effect being 184 ± 63%.

Conclusions: Substitution of isolated intravascular deficits in cardiopulmonary healthy adults merely with ringer's lactate impedes maintenance of intravascular normovolemia. Replacement of blood losses by crystalloids, are required at the 5-fold amount. Main side effect was an impressive interstitial edema.

References

1 Chappell *et al.* A rational approach to perioperative fluid management. *Anesthesiology* 2008; **109**:723–40.

2 Rehm M *et al.* Changes in intravascular volume during acute normovolemic hemodilution and intraoperative retransfusion in patients with radical hysterectomy. *Anesthesiology* 2000; **92**: 657–64.

3 Finfer *et al.* A comparison of albumin and saline for fluid resuscitation in the intensive care unit. *N Engl J Med* 2004; **350**:2247–56.

Paper No: 527.00

Incidence of epidural anesthesia in kindney's transplant

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Introduction: The anesthesia in kidney's transplant started to be used in the beginning of 20'th century. With the advent of pharmacological researches, the spinal anesthesia used at first, was substituted by general anesthesia, making possible the patients monitoring with more security and less procedure effects.

Material and Methods: The aim of this research was to evaluate the epidural anesthesia in kidney's transplant at Policlínica Pato Branco - PR. A retrospective study was conducted, with 320 patients, from 1986 to 2008. Varieties such as gender, age, blood tipe, aneshesia tipe, donator tipe and port-anesthesia complications were considered. For statics, it was used the student test T.

Results: In this research it was observed the prevalence of male over female gender (58,7%). The age with more incidence was between 41 and 45 years old (16,9%). Type O positive was the predominant blood type seen(45,6%). The epidural anesthesia was the most prevalent, corresponding to 89% from total of anesthesia procedures. The dead donators were more prevalent. Relevant complications wereńt found in none of the procedures.

Conclusion: In this research it was observed that epidural anesthesia is a technic that can be used in kidneýs transplant, because it doesńt bring severe complications. Its value to say that the absence of depressing drugs, constant arterial blood pressure monitoring, and heart frequency show us that this kind of procedure makes this transplant safe and able, so that the patient can get a better recovery after surgery,

References

1 Revista Brasileira de Anestesiologia, 1988; **38**: 5: 321–325

2 Revista Brasileira de Anestesiologia, 2009; **59**: 2: 166–176.

Paper No: 534.00

Patient autonomy kills

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Introduction: Gillon considers autonomy as ¡°first among equals¡±, because it is a necessary component of aspects of beneficence, non-maleficence and justice. These provide the moral framework for a ¡°moral mission statement¡± for the goals of medicine in whatever culture - provision of health benefits with minimal harm in ways that respect people¡s choices for themselves and that are just or fair to others. 1

Objective: This case illustrates how choice driven patient care, on the basis of informed consent by respecting patient autonomy can affect patient outcome. Sometimes medical paternalism is appropriate especially in highly specialised field.

Method: A post-surgical neurosurgical intensive care patient case-study. Results 40 year old Mr X presented to Neurosurgery with seizures, symptoms of vu. MRI revealed a 3 x 2.5 x 2.3 cm right temporal lobe lesion. The neurosurgeon advised craniotomy, total lesion excision and possible subsequent chemo or radiotherapy. After doing some research Mr X opted for stereotactic biopsy only and total excision at a subsequent operation. 3 days after uneventful biopsy, he suffered severe headaches and became unconscious. Urgent CT scan revealed massive intracerebral bleed from the tumour into the temporal lobe. Despite emergency decompressive craniectomy, clot and tumour excision, he did poorly, losing his brainstem reflexes. He became hypotensive. One week

after the biopsy, the family requested withdrawal of ventilator support.

Discussion: Post-operative bleeding after stereotactic biopsy is a known complication since the site of biopsy is not visible to the surgeon, despite being less invasive. If Mr X had agreed for a craniotomy, total tumour excision can be performed at one sitting and proper haemostasis secured. Unlike certain operations (eg breast cancer) where histology would determine the next definitive operation, craniotomy and total excision of this small lesion would be appropriate, sparing him the risks from 2 surgeries and general anaesthetics. Mr X¡s treatment was undertaken after informed consent was voluntarily given. He demonstrated correct understanding of the nature of the procedure, risks, benefits and alternatives.

Conclusion: Did autonomy kill Mr X ? Would his outcome differed if the neurosurgeon, as the expert, had exercised medical paternalism, insisted that total tumour excision at one sitting is best? However, Mr X gave valid consent as he was informed, was competent and not coerced. 1 This case illustrates that patient autonomy can work against patients¡ best interests, like many other instances of competent patients exercising their autonomy by refusing beneficient treatment. Over-riding their decision and treating them amounts to battery.

References

1 Ethics needs principles¡ªfour can encompass the rest¡ªand respect for autonomy should be ¡°first among equals¡± R Gillon J Med Ethics 2003; **29**:307C312

2 Hope T, Saluvescu J, Hendrick J. Medical Ethics and Law. *Second Edition. Churchill Livingstone Elsevier* 2008.

Paper No: 562.00

Triggering factors and role of yawning

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Introduction: Yawning is a stereotyped behavioral pattern that usually occurs during normal and pathologic conditions. The psycophysiologic significance of yawning seems to be an arousal reflex to increase attention. One of the most frequently encountered clinical situations during which yawning occurs in the IV induction of general anesthesia. A typical yawn is characterized by a single large inspiration with simultaneous mouth opening and stretching of the trunk. The triggering factors, however, are not still clearly known and role of yawning is controversial.

Objectives: To find out triggering factors of yawning during induction of general anesthesia with propofol and to reveal the significance of yawning

Methods: Patients who were between 18∼50 years old, of ASA I∼II, and scheduled for surgeries except thoracic, cardiac and organ transplantation surgeries under general anesthesia were included. Patients with neurologic dysfunction, in use of benzodiazepines, anticonvulsants, alcohol, opioids, or other psychotropic drugs (chronically or within 24 hours before the induction of anesthesia), and underwent rapid sequence induction were excluded. At holding room, patients answered the questionnaire of Spielberg anxiety score. NIBP, SpO2, ECG, EtCO2, BIS and body temperature were measured as basal V/S value when they entered operating room. After preoxygenation, 1mg/kg lidocaine and 2mg/kg propofol were injected. To examine the occurrence of yawning, the anesthesiologists waited for the maximum of 1 minute and administered 0.6mg/kg rocuronium for intubation. Spielberg anxiety score, time at which patients entered OR, NPO time, basal V/S values, V/S values after propofol administration, time of yawning after propofol administration, V/S values after intubation were recorded.

Results: 100 patients were enrolled. 57 patients yawned within 21.34¡Ó5.07 seconds after propofol administration. Patients who yawned showed significantly lower Spielberg anxiety score than patients who did not (48.70¡Ó9.59 vs 66.15¡Ó11.32, $p<0.05$). 31 patients who yawed and 25 patients who did not yawn were anesthetized before 2 p.m while 26 patients who yawned and 18 patients who did not yawn were anesthetized after 2 p.m, which failed to show statistical significance. Unlike the patients who did not yawn, all the patients who yawned showed transient increase during the continuing decrease in the BIS value after propofol injection.

Conclusion: Less anxious patients tend to yawn more than more anxious patients. Though diurnal cycle may have some relevance to yawning, further study with large sample size is needed to prove statistical significance.

Paper No: 572.00

Use of propofol TCI in conductive anesthesia for sedation intraoperative as a method strategic for knowledge, titulation and prediction of this drug

Jose Joaquin Egas-Dominguez and **Alexandra Caballero Mendoza**

Introduction: Advances in anesthesia techniques such as TIVA TCI in our country is relatively recent. The management of Propofol has been a challenge for us, so we decided to use in TCI as a supplement in Anesthesia effect conductive, while frequent and rationed their use allowed us a better understanding of the drug

Objectives: Properly handle and holder TCI effect propofol in conductive anesthesia, and relationships dose with this degree of clinical change: consciousness, ventilation and hemodynamics, as well as provide the patient a perioperative state without anxiety and greater sense of wellbeing.

Methods: Clinical Observation was performed in 46 patients with conductive anesthesia. TCI effect propofol was infused, we use Marsh and Schnider pharmacokinetic models of pump Base Primea Orchestra. It started with a dose of 0.5 ug/ml in all patients, was climbing the dose and slow upward of 0.1 ug/ml until desired sedation with spontaneous ventilation, good breathing pattern, Ramsay 3-4, and saturation between 95 and 100% O2 at 2 liters per minute
Results: We included 46 patients with mean age of 50.47 years (range=17-92 years). The mean dose of propofol TCI actual effect was 0.8 ug/ml (range 0.3 to 1.4 ug/ml), Marsh pharmacokinetic model was used in 65.2% (less than 60 years old) and Schnider in 34.8% of patients (more than 60 years old). Gain the qualification there was no need for changes in doses despite prolonged surgical times. Mean operative time 127.82 minutes (range 60-300 minutes). Ventilation was spontaneous and good breathing pattern throughout the perioperative SpO2 between 95 and 99% (mean=97.6%). The state of consciousness was assessed with the Ramsay scale which remained unchanged throughout the postoperative value 3 (6% of patients) and 4 (94% patients). No significant hemodynamic changes in the propofol infusion than expected by conductive anesthesia, because the doses of propofol were up and paused. 100% patients reported great satisfaction of sedation
Conclusions: Management of Anesthesia conductive TCI propofol and holder allows the drug known as the desired effect. The results also help us to plan their proper use in induction and maintenance of intravenous anesthesia

Paper No: 584.00

Experience in anaesthesia management for major pelvic ring surgery

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Introduction: Pelvic ring fractures occur as the result of high – energy trauma as car accidents or falling down from a distance. Mortality rate of patients with pelvic ring fracture depends on the type of pelvic fracture and/or from other adjacent organ injuries and may reach 20%.
Purpose: The aim of this study was to determine the different anaesthesia techniques during major pelvic ring surgery.
Materials and Methods: Retrospective analysis was carried out in Lithuanian University of Health Sciences Hospital. There were analyzed 101 patients who underwent major pelvic ring osteosynthesis operations during the period 2003-2010. Analyze demographic data of the test group, rated ASA class, anaesthesia techniques and workflow features. Data were analyzed using Microsoft Excel and SPSS 13.0 software. P value <0.05 was considered statistically significant.
Results: Polytrauma was diagnosed to 81 (80.2%) patients while isolated ring injury was diagnosed to20 (19.8%) patients. Patients' age average were 41 ± 15.18 years. According to ASA classification 4 (3.96%) were ASA class I, 56 (55.44%) – ASA class II and 41 (40.59%) – ASA class III. 75 (74.25%) patients were assigned for endotracheal anaesthesia, 20 (19.80%) – for spinal, 3 (2.97%) combinated epidural – endotracheal and 3 (2.97%) for spinal-epidural anaesthesia. Average duration of surgery procedure was 151.3 ± 64 min. Intraoperative fluid infusion therapy consisted mainly of cristaloids 2668.5 ± 844 ml, 35 (34.65%) patients had additional infusion of colloids 551.43 ± 167 ml. Before operation blood transfusion was applied for 39 (38.61%) patients, intraoperative blood transfusion was applied for 24 (23.76%) patients, postoperative blood transfusion was applied for 32 (31.68%) patients. Fresh frozen plasma was infused during the operation for 4 (4.7%) patients. Hemodynamic instability (hypotension) was observed in 57 (56.43%) patients, of which 44 (77.19%) had endotracheal anaesthesia and 13 (22.81%) had spinal anaesthesia. No significant differences were observed in the development of hypotension between spinal and endotracheal anaesthesia ($p>0.05$). 80 (84.7%) patients were returned to Trauma department after operation, 21 (15.3%) – were transported to Intensive Care Unit and 6 of them were monitored for respiratory failure.
Conclusions: 1) Frequently major pelvic ring surgery was performed under endotracheal anaesthesia. 2) Hemotransfusion statistically significant was preformed during the time of anaesthesia comparing to preoperative and postoperative period. 3) The frequency of hypotension was not statistically significant comparing endotracheal and spinal anaesthesia.

Paper No: 591.00

Anesthesia total intravenous based in the analgesia with effective minimum dose of propofol controlled with cerebral monitor ioc - view

Jose Joaquin Egas-Dominguez and **Alexandra Caballero Mendoza**

Introduction: Based on the concept of stress-free anesthesia, effective management of analgesia is essential. The pharmacokinetic profile of remifentanil offers advantages for this type of anesthesia, and hypnosis has lower requirements. But we owe monitor the anesthetic depth to prevent memories due to superficial anesthesia.
Objectives: Anesthesia based on the analgesia with high doses of remifentanil and to decrease doses of propofol,

keeping an adequate anesthetic plane, and to control depth of anesthesia with monitor IoC – View and correlate this with hemodynamic status.
Methods: Propofol-Remifentanil TIVA TCI 60 patients. Induction with increasing doses of propofol until loss of consciousness and brain monitor IoC - View value between 40 and 60, was administered followed muscle relaxant and start with dose of remifentanil until values of 10ng/ml or more, while we began to descend Propofol. We proceeded to intubate, and before the surgical incision is further increased remifentanil, propofol was maintained at low doses. Always check that the brain monitor is kept between 40 and 60. Multimodal analgesia was performed to prevent postoperative pain.
Results: We studied 60 patients. Average dose induction propofol TCI (effect) before administrated muscle relaxant was 2.7 ug/ml (Range 2.0 to 3.5 ug/ml) and intraoperative maintenance dose in 70% of the patients was 1.8 ug/ml. Other 30% was from 1.4 to 1.7 ug/ml. Remifentanil TCI average dose effect on intubation was 11 ng/ml and 13ng/ml anesthesia maintenance (Range 11-15 ng/ml). Brain Monitor IoC-View when higher dose of propofol for induction was value 54, at the time of intubation 48, and during the intraoperative 45 average. Waking the value of propofol in 75% of the patients was between 0.6 and 0.9 ug/ml, the other 25% was 0.4 and 0.5 ug/ml. Remifentanil for waking the average was 3.3 ng/ml. The value of IoC View at this time was 98. There was good correlation between the values of Ioc-View and hemodynamic clinical parameters, making safe and fairly predictable technique.
Conclusions: Anesthesia based on the analgesia offers a stress-free surgery, requiring lower doses of the hypnotic, which are safe using the IoC - View brain monitor, the same one that demostrated excellent clinical correlation.

Paper No: 609.00

Epidural ozone treatment for chronic pain lumbar for disk hernia

Alexandra Caballero Mendoza and **Walter Andrade Mendoza**

Introduction: Today has been a growing awareness of the benefits of ozone in many areas of medicine. The remarkable efficacy of this gas in analgesic and anti-inflammatory effects in addition to its ability to absorb and dry the disc material have led to its use in such conditions that cause chronic pain, as well as the techniques used are less invasive
Objectives: To administer ozone in the epidural space in patients with herniated disc, thereby reducing the size of the hernia and consequently the relief of chronic pain
Methods: We had 17 patients diagnosed clinically and with MRI of lumbar disc hernia at different levels, arrived with pain and limitations referring to certain movements and activities. Ozone was administered into the epidural space at the herniated disc in three sessions, a weekly for three followed weeks. In each session, once reached the epidural space with a Tuohy needle were administered 15 ml of ozone gas slowly. Pain relief was assessed with the EVN scale (Verbal Numeric Scale). We performed a clinical control and MRI the year after treatment.
Results: The average age of the patients is 53.5 old years (29-86 old years). EVN baseline was 6 (2 pctes), 7 (4pctes), 8 (9pctes) and 9 (2pctes), in the second session EVN had fallen to 50%, and the third session of 90%. At the monthly monitoring all patients reported no pain, and could perform all normal activities. Subsequent verification was performed MRI which revealed no evidence of hernia. At year there is new control patients reported improvement the same total. Two of the patients entering the study had previously scheduled column invasive surgery, after successful treatment they did not need surgery. Currently we have more patients in treatment, they are not included in the study and not yet completed the year after treatment, but to the moment the results are satisfactory.
Conclusions: Epidural Ozone proved to be a safe, effective and minimally invasive technique, pain-relieving chronic disc herniation by causing dehydration of the disc and consequent reduction in the size of the hernia.

References

1 http://www.telefonica.net/web2/mdle/fold/
2 http://www.cto-am.com/cmicol.htm
3 http://scielo.isciii.es/scielo.php?pid=S1134-80462009000300002&script=sci_arttext
4 http://www.redsalud.gov.cl/portal/url/item/71aa300d110c9efde04001011f015f22.pdf
5 http://www.ateramex.com.mx/Info_web/TRATAMIENTO%20DE%20LA%20COMPRESION%20RADICULAR%20CON%20OZONO.pdf

Paper No: 612.00

Thorax surgery mortality at the high complexity general hospitalcenter of Neiva – Colombia –2010

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Introduction: At present, thorax surgery covers a wide spectrum; it includes infectious diseases, congenital, trauma and cancer. This is possible thanks to scientific progress (risk stratification, surgical techniques, anesthesiology techniques, pain management and ICU management) and technological advances video thoracoscopy, bronchial blocking and mechanical ventilation. The Hospital Universitario Hernando Moncaleano Perdomo de Neiva is an institution that takes care of all kinds of pathologies and patients (General Hospital) with limited economic resources. Thoracic surgery is

Table 1 Thoracic surgery procedures

	Procedure	n %
Thoracoscopy plus decortication	54	70.1
tracheal surgery	8	10.4
Lung resection by Thoracoscopy	6	7.8
Lobectomy by Thoracotomy	2	2.6
Thymectomy	2	2.6
Thoracotomy pneurorraphy-Pleurodesis	1	1.3
Mediastinoscopy	1	1.3
Mediastinic mass resection	1	1.3
Thorax wall mass resection	1	1.3
Diaphragm hernia correction	1	1.3
TOTAL	77	100%

Table 2 Distribution per age group and mortality Thoracic surgery procedures

	Procedure		n %	
Age	years	Number	Surgeries %	Deaths % (deaths per group)
14 to 30	26	33.7	1	3.8
31 to 50	18	23.4	3	16.7
51 to 60	13	16.9	4	30.8
Over 60	20	26	7	35
TOTAL	77	100	15	19.5

frequent and it is therefore important to know our mortality statistics. The 2010 databases were revised to gather the basic epidemiology data of the patients who had undergone thoracic surgery, as a basis to improve care and carry out further research.

Objectives: Determine mortality on day 28 and basic epidemiological aspects of adult patients undergoing thorax surgery at the HOSPITAL UNIVERSITARIO HERNANDO MONCALEANO PERDOMO, of Neiva - Colombia, during the period of January 1st to December 31st, 2010.

Method: Retrospective observation study taking into account as secondary data sources the operating theater records, the statistics service and the hospital mortality records. The analysis was done using Epi-info 3.2.

Results: During 2010, 77 thoracic surgery procedures were carried out, of these an 87% (67 patients) were programmed 13% (10 patients) were emergencies. There were 52 male patients (67.5%) and 25 women (32.5%). Fifteen patients of the total (19.5%) died; the group aged over 60 years showing the highest mortality (35%) and the group below 30 years showed the least mortality (3.8%). Endoscopic procedures were done on 79.2% of cases and open procedures (Thoracotomy – mediastinotomy) on 20.8% of the cases. The intraoperative mortality rate was 1.3% (1 patient); 50 patients were moved to a standard Post-Anesthesia Care Unit (65%) and 26 (33.7%) to an Intensive Care Unit. The most frequent procedure was thoracoscopy plus pleuropulmonary decortications (70.1%). See table 1.

Conclusions: As reported in the literature the thoracic surgery mortality rate at 28 days is high (between 15% and 23%) and we fall within that range. Most of these procedures are done in patients over 50 years of age, when co-morbidities increase. Deficiencies were found in the hospital databases with under recording of activities, limiting the studies and epidemiological decision making.

References

1 Systematic classification of morbidity and mortality after thoracic surgery. Seely AJ, Ivanovic J, Threader J, Al-Hussaini A, Al-Shehab D, Ramsay T, Gilbert S, Maziak DE, Shamji FM, Sundaresan RS. Ann Thorac Surg. 2010 Sep;90(3):936-42; discussion 942. Department of Surgery, Division of Thoracic Surgery, University of Ottawa, the Ottawa Hospital, Ottawa, Ontario, Canada.

2 Valoración del riesgo quirúrgico en cirugía de tórax. Parámetros del riesgo quirúrgico. Y.W. Pun. Servicio de Cirugía Torácica. Hospital Universitario de la Princesa. Madrid. España. Arch Bronconeumol 2004;40 (Supl 5):33-7 (Assessment of surgical risk in thorax surgery. Surgical Risk Parameters.)

3 An update on anesthesia for thoracoscopic surgery. Gregor y W. Fischer and Edmond Cohen Current Opinion in Anesthesiology 2010, **23**:7–11

Paper No: 619.00

Fibrinogen concentration and postoperative bleeding in total hip replacement arthroplasty: a preliminary observational study

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Introduction: Total hip replacement arthroplasty (THRA) is associated with the intra- and postoperative substantial blood loss and high requirement for allogenic blood transfusion. Identification of patients expecting postoperative blood loss would be desirable to establish perioperative transfusion management.

Objectives: We examine the relation of the hematologic variables and FIBTEM with postoperative blood loss (PBL) in elective THRA surgery.

Methods: In 15 patients undergoing THRA due to the avascular necrosis of femoral head, pre- and postoperative hematologic examination (hematocrit, platelet, fibrinogen, activated partial thromboplastin time, prothrombin time) and FIBTEM test were performed. PBL via closed suction drain was

recorded, and we analyzed the correlation among those factors.
Results: PBL was greater in patients who had lower pre- and postoperative fibrinogen concentration (PBL=?0.9 ¡¿ preop-fib+667.4, r2=0.912, P=0.003; PBL=?1.1 ¡¿ postop-fib+633.6, r2=0.823, P=0.013). Low MCF of FIBTEM was also associated with greater PBL (PBL=?21 ¡¿ preop-MCF+701.7, r2=0.727, P=0.003; PBL=?17.7 ¡¿ postop-MCF+536.1, r2=0.488, P=0.036).
Conclusion: In this preliminary study, low fibrinogen level and low FIBTEM MCF parameter was related with greater blood loss in patients undergoing THRA.

Paper No: 625.00

Induction in sitting with noninvasive ventilation in patients with morbid obesity

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Introduction: Obesity represents a public health problem that conditions high morbidity and mortality conditions. Metabolic surgery imposes itself as a palliative method, and even as a cure. The management of the patients is a challenge for the anesthesiologist team specially in airway management .
Objective: Evaluate the benefits of noninvasive ventilation in sitting position in the anesthetic management of patients with morbid obesity bariatric surgery.
Methods: We report an observational study with seven patients with morbid obesity 3 women and 4 men with an average body mass index BMI of 47,42 and an average age of 35 years All of them were planned for metabolic surgery. The patients were evaluated and trained with noninvasive ventilation before surgery using the workplace anesthetic fan. That fan was previously set up, with patterns of pressure support peep and flow high. The day of surgery the patient is not lying down, the patient enters the room, sits in front the operating table and is placed a face mask fastened with an elastic harness. Then stars the induction with Sevoflurane CAM 4 volume %, Fentanyl 200 mcg, Lidocaine 1.5 mg per kilogram of ideal weight, the dream is referred patient lies down then is administered variable dose of Propofol. The next step is to perform a laryngoscopy with a "McCoy sheet" and an intubation using endotracheal tube with guiding. In according with this step previously is recommended to use local anesthetic on the glottis. we evaluate the time to ensure optimal conditions for intubation, oximetry in first 6 minutes, drug doses, need of muscle relaxation, easy to ventilate.
Results: All patients (total of seven) were intubated at the first attempt, the average time to secure the airway was 3.19 minutes (minimum 3.05 maximum 3.45), pulse oximetry was on average 96.37% saturation. Only one patient presented saturation 58% 2.4 minutes after intubation, none deserves muscle relaxation. The maximum dose of Propofol was 400 mg for only one patient, the rest six patients were administered doses of 200 mg being the average of 228 mg, all received a standard dose of 200 mg of Fentanyl. Just Three patients (42.8%) needed be fan.
Conclusion: There are a lot of advantages of this method and on this way is possible to avoid aortocaval compression, the commitment of the CRF. Making intubating conditions without muscle relaxants and standard doses of drugs safely and without periods of desaturation

Paper No: 644.00

Challenges faced in the teaching of medical ethics in the intensive care unit

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With the advancement of technology, medical practice has become increasingly complicated. Bioethics emerged as a distinctive discipline in response to the challenges posed by these technological advances; particularly end of life issues and patient autonomy . Ethical dilemmas are often seen in the intensive care setting. In order to teach medical ethics in such a way that is relevant to the practicing clinician, we must first recognize the problems faced. This discussion is confined to a surgical intensive care unit in our hospital but the principles can be applied universally.
Problems a) Medical/nursing staff The stresses of intensive medical and nursing care in a busy unit are such that ethical considerations may often be overlooked. Senior staff may be too busy or not conversant with ethical issues as many would not have received formal training in this area.
b) Communication The critically ill patient is usually unable to communicate with his health care providers. Furthermore, in our asian culture, issues pertaining to end of life are seldom discussed among family members. The management of patients involves multi-disciplinary teams who may not always concur on ethical issues.
c) Education Although medical ethics is incorporated into the medical school curriculum, there can sometimes be a disconnect as students are unable to relate theoretical principles to their clinical practice. Junior doctors also face difficulties in dealing with and learning from ethical problems. Academic staff may be out of touch with the problems faced on the ground while practicing clinicians may lack teaching ability.
Possible Resolutions
a) Medical curriculum The syllabus taught has to be relevant to clinical practice, with clinician input taken into account.
b) Educating clinicians Forums, discussions and conferences will only reach out to a small proportion of clinicians and attendance at these are often superseded by other academic and training requirements . Ideally, the teaching of ethics

should be incorporated into daily ward rounds; perhaps initially the teaching can be limited to a specific case discussion.

Conclusion: A mindset change is thus required. One possibility is the training of interested clinicians in teaching ethics who are then invited to these ward rounds to share their expertise.

References

1 E. Jackson. Medical Law Mason and McCall Smith Law and Medical Ethics

Paper No: 661.00

Low-volume acute normovolemic hemodilution in elective coronary surgery performed with cardiopulmonary bypass

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Introduction: Acute normovolemic hemodilution (ANH) refers to the removal of blood from the surgical patient immediately before or just after induction of anesthesia, replacement with asanguinous fluid, and later reinfusion of the withdrawn blood. It is simpler and less expensive to obtain autologous blood by ANH than by preoperative autologous blood donation. Numerous studies confirm positive effects of ANH with the use of drugs with hemostatic properties on perioperative blood sparing, but efficacy of this technique is far from being settled.

Objectives: To evaluate blood-sparing effects of minimal ANH on reducing the need for allogenic transfusions in elective coronary surgery performed with cardio pulmonary bypass (CPB) as well as its influence on postoperative morbidity and mortality.

Methods: One-hundred twenty four consecutive patients (baseline hematocrit $>37\%$) were prospectively randomized to tranexamic acid treatment (control group; 60 patients) or to tranexamic acid treatment plus normovolemic withdrawal of $8\% \pm 2\%$ of the circulating blood volume (ANH group; 64 patients). All patients had shed blood reinfused (cell saver). The requirement for allogeneic transfusions, based on strict a priori defined criteria, was the primary end point of the study. Hematochemical evaluations, bleeding, major complications, and other outcomes were also recorded.

Results: Demographics, baseline hematochemical data, and operative characteristics were similar in the two groups. Seventeen patients in the ANH group versus 22 patients in the control group ($p=0.25$) required transfusion of a smaller number of packed red blood cell units (37 ± 1.096 vs 45 ± 1.310, $p>0.05$). On the other hand, higher rate of postoperative complications, including respiratory insufficiency, myocardial infarction, atrial fibrillation, infection, (15/60 vs 5/64, respectively, $p=0.01$) was notice in control group. Patients in control group had longer in-hospital stay than patients in ANH group (8.9 ± 6.2 vs 7.4 ± 2.5, respectively, $p=0.064$). There was no difference in in-hospital mortality between the groups (1/60 controls group vs 0/64 ANH group).

Conclusions: In our study, low-volume ANH in patients undergoing elective coronary surgery with CPB failed to reduce the need for allogeneic transfusions and postoperative bleeding. However, patients who underwent ANH had less postoperative complications and shorter in-hospital stay.

References

1 Casati V, Speziali G, D'Alessandro C, *et al.* Intraoperative low-volume acute normovolemic hemodilution in adult open-heart surgery. *Anesthesiology.* 2002; **97**: 367–373.

2 Society of Thoracic Surgeons Blood Conservation Guideline Task Force, Ferraris VA, Ferraris SP, Saha SP, Hessel EA 2nd, Haan CK, Royston BD, Bridges CR, Higgins RS, Despotis G, Brown JR; Society of Cardiovascular Anesthesiologists Special Task Force on Blood Transfusion, Spiess BD, Shore-Lesserson L, Stafford-Smith M, Mazer CD, Bennett-Guerrero E, Hill SE, Body S. Perioperative blood transfusion and blood conservation in cardiac surgery: the Society of Thoracic Surgeons and The Society of Cardiovascular Anesthesiologists clinical practice guideline. Ann Thorac Surg. 2007 May; 83 (5 Suppl): S27–86.

3 Mahoori A, Heshmati F, Noroozinia H, Mehdizadeh H, Salehi S, Rohani M. Intraoperative minimal acute normovolemic hemodilution in patients undergoing coronary artery bypass surgery. *Middle East J Anesthesiol.* 2009 Oct; **20**(3): 423–9.

4 Casati V, Benussi S, Sandrelli L, Grasso MA, Spagnolo S, D'Angelo A. Intraoperative moderate acute normovolemic hemodilution associated with a comprehensive blood-sparing protocol in off-pump coronary surgery. *Anesth Analg.* 2004 May; **98**(5): 1217–23.

Paper No: 668.00

General anesthesia in patients with charcot marie tooth disease

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Residente 2do. año

Introduction: Charcot-Marie-Tooth Disease (CMTD) is an inherited motor and sensory polyneuropathy prone to clinical aggravation due to anesthetic-surgical procedures. The selected anesthetic technique is controversial; the preanesthetic evaluation is of the utmost importance. The aim of the present work is to report the anesthetic strategy utilized in 2 patients bearing CMTD.

Case 1: Female, 53 yr, 54kg, ASA II, Mallampati III, negative clinical history. Surgery: video laparoscopic cholecystectomy. Normal laboratory tests, electrocardiogram and respiratory

evaluation. Neurological evaluation: inherited polyneuropathy type1 with walking disorders, fatigue, spastic paraparesis and airways lability. Pre-medication: 3mg midazolam. Anesthesia: TIVA. Induction: fentanyl 100ug, propofol 50mg, atracurium 27mg. Maintenance: propofol 75-150ug/kg/min, remifentanyl 0.25-0.5ug/kg/min, atracurium 10mg/30min. Orotracheal intubation. Intra surgical procedures: controlled mechanical ventilation, stable hemodynamics. Surgery duration: 45min. Neuromuscular control blocking: TDF4/4,T4/T1=100%. Pharmacological reversal of neuromuscular-blocking. Extubation without complication. Derived to common room (Alderete10/10). Released at 24h.

Case 2: Male, 13 yr, 45kg, ASA II, Mallampati I, negative clinical history. Surgery: muscle biopsy. Normal laboratory tests, electrocardiogram. Neurological examination: pain and muscle cramps in thighs, cavus foot, short Achilles tendon, walking with external support. Pre-medication: midazolam 2mg. Anesthesia: TIVA. Induction: fentanyl 75ug, propofol 150mg. Maintenance: propofol 75-150ug/kg/min, remifentanyl 0.25-0.50ug/kg/min. No muscular relazant were used. Orotracheal intubation. Intra surgical procedures: Controlled mechanical ventilation. Hemodynamic stabilized. Surgery duration: 30min. Extubation without complications. Derived to common room (Alderete10/10). Released at 48h due to social reasons.

Discussion: CMTD is an inherited peripheral neuropathy with muscle atrophy and loss of propioseption. Estimated prevalence: 1/2500 subjects. Classification: type1: predominantly demyelization; type2: predominantly axon degeneration. Genetic and clinical heterogeneity. Anesthetic recovery delay with affected motor sensory activity due to thiopental delay anesthesic recovery is not recommended. Propofol was priviledged. Two reports have warned on malignant hyperthermia onset. This association is not physiopathologically explained, anyway later works did not exclude it.1;2 TIVA was preferred. Denervation predispose to K+ released due to succinylcholine. Atracurium was used in Case 1 due to its short half life. Long lasting muscle blocking and respiratory failure were reported with the former drug, nevertheless, patients with preserved brachial muscle function and normal spirometry are likely to present low complication probability1. Pre anesthetic evaluation and proper methodology provide secure patient management.

Keywords: Charcot-Marie-Tooth; general anesthesia; malignant hyperthermia

References

1 Miller M, Yacsich P, Jans J. Manejo anestésico en Enfermedad de Charcot-Marie-Tooth. A propósito de un caso. *Rev Chil Anestesia*. 2006; **35**:187-90.

2 Soto D, Bermejo M, Rubio P, García M. Anesthetic considerations in Charcot-Marie-Tooth disease. *Rev Esp Anestesiol Reanim*. 2011; **58**(4):256-8.

Paper No: 669.00

General anesthesia in patients with ectodermal dysplasia

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Introduction: Ectodermal Dysplasias (ED) are inherited diseases characterized by alteration of ectodermal structures with more than 170 clinical disorders. The ectrodactyly-ectodermal dysplasia-lip-cleft palate syndrome (EEC) is a rare ED type. They are a challenge to anesthesia procedures due to persistent respiratory tract infection caused by anatomic anomalies; malnutrition and anemia; difficult management of upper airways produced by structural anomalies; cornea lesions produced by diminished tear secretion; thick and abundant respiratory secretions;1 hyperthermia due to hypohidrosis not related to malignant hypertemia.1;2

Case 1: Male, 15 yr, 58kg, ASA II, Mallampati II. Medical history: frequent acute otitis media. Diagnosis: hypohidrotic ED: hypodontia, hypoplastic fingers, narrow nose, epicanthus, jaw hypoplasia, hypotrichosis. ECG: right bundle branch block. Other cardiovascular examinations and routine laboratory tests were normal. Surgery: tympanoplasty. Co-induction: midazolam 4mg, propofol 80mg, fentanyl 125mg, vecuronium 6mg. Maintenance: propofol 75-150ug/kg/min, remifentanyl 0.25-0.50ug/kg/min. Direct orotracheal intubation, unique maneuver. Mechanical controlled ventilation, semi-closed system, circular circuit. Parenteral hydration: 1200ml saline. Reversal of neuromuscular-blocking. Hemodynamically stable. Duration: 105min. Extubation without complications. Derived to common room (Aldrete:10/10). Normothermic. Released at 6h.

Case 2: Male, 7 months, 7kg, ASA II, Mallampati I. Medical history: born at term, adequate weight, Apgar: 9/10. Diagnose: EEC: cleft lip and palate, bilateral presence of 3 fingers, 2 toes. Negative family history either for malformations or for consanguinity. Normal psychomotor development. Normal electrocardiogram, echocardiogram, renal/abdominal and transfontanelar echography. Hormone levels: FSH/LH/testosterone: subnormal. Surgery: cleft lip and palate correction. Induction: sevofluorane 8%, fentanyl 7ug, vecuronium 0.5mg. Maintenance: sevofluorane 2%, remifentanyl 0.25-0.5ug/kg/min. Direct orotracheal intubation, unique maneuver. Manual controlled ventilation, Mapleson D system. Parenteral hydratation: 150ml saline. Reversal of neuromuscular-blocking. Hemodynamically stable. Duration: 150min. Extubation without complications. Derived to common room (Aldrete:10/10). Normothermic. Released at 24h.

Discussion: Literature on ED is scarce. Reports' recommendations: pre-anesthetic correct evaluation to detect respiratory infections, malnutrition, anemia, and anatomical airways alterations; adequate preparation for difficult ventilation/intubation; ocular protection with ointment or patches; physiotherapy, tracheal intubation, controlled ventilation with humidification and ETT aspiration; rectal temperature monitoring, room temperature control and of parenteral fluids, and no atropine premedication.1;2 Report of these infrequent cases might be of interest to know the particular care warnings required by ED patients in order to improve their wellness and diminish complications.

Keywords: Anesthesia; ectodermal dysplasia; hypohidrosis

References

1 Mizushima A, Satoyoshi M. Anaesthetic problems in a child with ectrodactyly, ectodermal dysplasia and cleft lip/palate. *Anaesthesia*. 1992; **47**: 137–40.

2 Yavuz I, Kiralp S, Baskan Z. Hypohidrotic ectodermal dysplasia: a case report. *Quintessence Int*. 2008; **39**(1): 81–6.

Paper No: 686.00

Patient and family expectations and perceptions about the quality of communication and their treating physicians. (pafact): an indian viewpoint

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Introduction: Patient and family perspectives about healthcare delivery are extremely important. Their unique expectations from their treating physician may not necessarily match those of the medical profession. Communication between physicians, patients and families is crucial for the latter's satisfaction with the care provided, especially in diseases like cancer 1,2. Good communication is likely to result in patients and families feeling more in control of the situation, and are more likely to follow through with treatment.

Objectives: A prospective survey amongst patients and their families to understand the characteristics and competence desired of their treating physician, adequacy of communication and their views about involvement in decision making.

Methods: We prospectively surveyed 100 patients undergoing thoracic surgery at a tertiary cancer centre in India between May and August 2011 and their relatives using a questionnaire. Participation was voluntary and responses were anonymous.

Results: Almost all patients and relatives felt that their physician should be knowledgeable, reliable in crises and be capable of taking decisions in difficult situations. Both patients and relatives felt that they needed more information regarding the nature and stage of illness (53% vs 58%), nature of treatment being provided (35%vs 32%), expenses and hospital stay (22%vs 27%) and discharge (17%vs 21%). Most (73%) patients had received a patient information leaflet and most (73%) felt the information provided was sufficient. Approximately half felt the need for more time with their physician during preoperative workup. Fewer (73%) relatives than patients (83%) felt that patients should be given details of their illness even if it would upset them. Most patients(80%) and relatives(88%) felt directly involved in decision making; surprisingly, both patients (88 vs 76%) and relatives (96 vs 66%) preferred relatives to be involved in decision-making more than patients themselves. Almost all (>90%) patients and relatives considered their treating physicians polite and caring and had a high level of trust. Almost all (>90%) felt that they were kept comfortable, pain-free and received prompt attention when needed.

Conclusion: Competence of the treating physician is extremely important for patient satisfaction with healthcare delivery. Addressing patients' overall needs and sharing complex information in an emotionally charged atmosphere and under severe time constraints is a challenge for oncologists at busy referral hospitals. Patients and families in India feel comfortable with relatives being more involved in decision-making than patients themselves. Most patients and families had high levels of trust and considered their oncologist polite and caring.

References

1 Fallowfield L, Jenkins V. Effective communication skills are the key to good cancer care. *Eur J Cancer*. 1999 Oct; **35**(11): 1592–7.

2 Baile WF, Aaron J. Patient-physician communication in oncology: past, present, and future. *Curr Opin Oncol*. 2005 Jul; **17**(4): 331–5.

Paper No: 697.00

Walking to the operation theatre prior to surgery makes the patients more satisfied

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Background: Usually patients are transported in a bed from the surgical ward to the operating theatre prior to surgery. This procedure seems to be based on a traditional thinking rather than a wish to involve patients in their own illness trajectory.

Objective: The purpose of this study was to investigate patients' satisfaction with walking from the surgical ward to the operation theatre (OR) instead of being transported in a bed. Furthermore, we wanted to identify the patients' satisfaction with the information given prior to surgery and to reveal their possible need for further information.
Method: and material 81 patients, scheduled for abdominal surgery, received postoperatively a questionnaire specifically developed for this study. 75 patients (aged 15-83 years) completed the questionnaire which focused on two areas: 1) satisfaction with walking instead of being driven in bed and 2) satisfaction with information about the procedure. The questionnaire consisted of a number of closed questions with a response format "yes" and "no". In addition, the questionnaire consisted of open-ended question which gave the patients the possibility to interact with the questionnaire and to write additional comments.
Results: 70 patients reported that it was a good experience to walk to the OR prior to surgery. However, 5 % (men 3 %, women 7 %) of the patients preferred to be transported in the bed to the OR. In total, 91% of the men and 95% of the women reported to be satisfied with the information about the procedure given by the anaesthesiologist during the preoperative interview. Furthermore, 89 % of the patients were satisfied with the information they received from the nurse about the route to the OR. Some patients had problems with finding the way to the OR (16% of the men and 5 % of the women). Neverthless, 70 of the 75 patients found it positive and rewarding to be involved.
Discussion: The results emphasize the importance of health care professionals maintaining focus on the capability of the patients' active involvement in their own trajectory. Health care professionals need to minimize patientś experiences of being ill and to identify areas where patients take on responsibility of their own situation and illness trajectory. Further, the importance of relevant information and clearly marked access to the OR need to be emphasized.
Conclusion: Let your patients walk to the OR and be sure that the route is clearly marked. Keywords: walk or be driven, operation theatre, patient satisfaction, transportation of patients,

Reference

1 Nagraj S, Clark CL, Talbot J, Walker S; Which patients would prefer to walk to theatre? *Surg Engl*. 2006 Mar Dec; **88**(2): 172–3
2 Turnbull LA, Wood N, Kester G. Controlled trial of the subjektive patient benefits of accompanied walking to the operating theatre. *Int J Clin Pract* 1998; **52**(2): 81–83
3 Keegan-Doody M. Walk or be driven? A study on walking patients to the operating theatre. *Br J Perioper Nurs* 2005; Dec; **15**(12): 529–31; 33–6

Paper No: 700.00

Landiolol hydrochloride improves the surgical Apgar score and outcome in off-pump coronary artery bypass surgery

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Introduction: Recent studies have demonstrated that the surgical Apgar score (SAS) is a predictor of postoperative risk of complications. The SAS is a simple 0-10 score that is based on estimated blood loss, lowest mean arterial pressure, and lowest heart rate during surgery. A strong association between SAS and postoperative mortality has been found in patients undergoing cardiac surgery. However, intraoperative drugs and techniques to improve SAS have not been widely investigated.
Objectives: The purpose of the study was to evaluate the effects of landiolol hydrochloride (an ultra-short acting ƒÒ1 blocker) on SAS and postoperative complications in off-pump coronary artery bypass surgery (OPCAB).
Methods: The study was performed as a retrospective review of patients (n=62) who underwent OPCAB at a single center over a 5-year period (January 2006 to May 2011). Preoperative risk factors, SAS (estimated blood loss, lowest mean arterial pressure and lowest heart rate), intraoperative variables, length of hospital stay, postoperative complications, and death were compared between patients who did and did not receive treatment with landiolol. Data are expressed as the mean ¡Ó SD. A two-sided p value <0.05 was regarded as statistically significant.
Results: Ten patients underwent surgery with administration of landiolol (group L) and 52 patients were treated without landiolol (group C). The patient backgrounds were similar in the two groups. SAS was significantly higher in group L compared to group C (6.4 ¡Ó 1.4 vs. 5.1 ¡Ó 1.5, p=0.012) and the lowest heart rate during surgery was significantly lower in group L (52.4 ¡Ó 2.3 vs. 61.8 ¡Ó 10.4 bpm, p=0.006). There were no significant differences in lowest mean arterial pressure and estimated blood loss between the two groups. The rate of postoperative complications was lower in group L (10.0% vs. 63.5%, p=0.004). However, mortality and length of hospital stay did not differ significantly between groups L and C.
Discussion: This study suggests that administration of landiolol hydrochloride contributes to improvement of SAS and reduction of postoperative complications. These results agree with recent studies indicating that continuous infusion of landiolol at low doses has beneficial effects on hemodynamic stabilization, heart rate control and prevention of atrial fibrillation in post-OPCAB patients. It is likely that

appropriate use of ƒÒ-blockers for hemodynamic stabilization improves SAS and outcome in OPCAB.

References

1 J Am Coll Surg. 2007 Feb; **204(2)**:201-8.
2 Anesthesiology. 2011 Jun; **114(6)**:1305-12

Paper No: 704.00

Hypertensive crisis under spinal anaesthesia a case presentation

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Introduction: High blood pressure in patients undergoing spinal anaesthesia is an uncommon clinical situation. Sympathetic block installed after subarachnoidal anaesthesia produces episodes of mild to moderate hypotension. Hypertension in these patients does not have a clear, pathophysiological explanation.
Case description: A 32-year old male patient, ASA II, enters the operating room for intervention of gastrocnemius flap after fracture of left tibia with loss of muscular mass. He is under enalapril 10 mg/day and low sodium diet due to high blood pressure. BP is 140/90 mmhg; HR, 80bpm. He is sedated with midazolam 0.04 mg/kg and fentanyl 1,5mcg/kg. A middle femoral sciatic block with bupivacaine 0.33% and epinephrine 1:200,000 for management of postoperative analgesia and subarachnoidal anaesthesia at L3-L4 level with hyperbaric bupivacaine 0.5%, 10 mg are performed. Thirty minutes after subarachnoidal blockade, a motor block (Bromage Score 3) and sensory level T8 are obtained. BP is 180/110 mmHg and HR, 120bpm. An I.V. infusion of clonidine 1mcg/kg is administered. At the end of the infusion BP reaches 300/200 mmhg and HR is 150bpm with no explainable cause. An arterial blood line for measurement of IBP and handling with vasodilatory drugs is placed. Clinically, a very pronounced carotid beat is noted while the patient remains sedated (Ramsay 2), with good air entry into both lungs and no signs of acute lung oedema. Sodium nitroprusside in I.V. continuous infusion 0.5mcg/kg/min is begun, with a poor response. Increased to 1mcg/kg/min, BP stabilizes at 160/90 mmHg. The patient is then admitted to CCU with stable BP under labetalol (200mg/24hs). Intraoperatively, the diagnostic hypotheses proposed are: intravascular injection/epinephrine absorption by peripheral blockade, accidental administration of vasopressor drugs, use of cocaine, phaeochromocytoma.
Results: Diagnostic studies performed during postoperative stay, such as abdominal ultrasonography and helical abdominal CT with I.V. contrast, reveal a solid nodular image of 50 x 52 mm in left renal upper pole. Diagnosis of phaeochromocytoma is confirmed by dosing urinary catecholamines in 24 hours: adrenaline 470 mcg, noradrenaline 2744 mcg, vanillin mandelic acid 55.2 mg.
Conclusion: An early detection of hypertension, bearing in mind phaeochromocytoma among other differential diagnoses, is essential for an adequate perioperative management.

References

1 Acta Anaesthesiol Taiwan. 2011 Jun;**49(2)**: 69-71. Epub 2011 Jun 22.
2 Cardiovascular collapse after labetalol for hypertensive crisis in an undiagnosed pheochromocytoma during cesarean section. Kuok CH, Yen CR, Huang CS, Ko YP, Tsai PS. Department of Anesthesiology, Hsinchu Mackay Memorial Hospital, Hsinchu city, Taiwan, R.O.C. PMID: 16798453 [PubMed - indexed for MEDLINE]

Paper No: 711.00

Changes in intraocular pressure during urological laparoscopy surgery

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Introduction: Intraocular pressure (IOP) increases during changes in body position, but the magnitude of this increase has not been quantified.
Objective: The aim of this study was to quantify changes in IOP and examine perioperative factors probably responsible for these changes while patients were in Trendelenburg and lateral decubitus position during laparoscopic prostatectomy and nephrectomy.
Methods: In this study, we measured IOP in 43 patients undergoing laparoscopic prostatectomy and 33 laparoscopic nephrectomies, with no pre-existing eye disease. Time points for measurements were: T1: anesthetized and supine position, T2: anesthetized after pneumoperitoneum had been established, T3:anesthetized in Trendelenburg position(15-20 degrees)in prostatectomies and lateral decubitus position in the case of nephrectomies, 1 hour post-pneumoperitoneum, T4: anesthetized, 3 hours post-pneumoperitoneum or at the end of the procedure, T5: anesthetized, supine, before awaking. Measurements were made with a hand-held applanation tonometer (Tonopen).
Results: Patients demographics and operative variables used as potencial predictors of changes in IOP were: age, ASA, BMI, duration of pneumoperitoneum, blood loss, intravenous fluid intake and amount of insufflation of CO2. These variables were not significant predictors of changes in IOP in each of the groups, only significant factors in the group of prostatectomies were the amount of insufflation of CO2 and the duration of pneumoperitoneum. Heart rate, mean arterial blood pressure, central venous pressure, end-tidal CO2 concentration and peak and plateau airway pressure

were kept constant throughout the study. The IOP mean values for each time point in mm Hg were as follows: T1: 11,41 prostatectomies/ 9,89 nephrectomies, T2: 22,77/ 21,22, T3: 25,94/23,08, T4: 26,44/ 24,83, T5: 19,75 /18,18. IOP mean values in T2, T3, T4, T5 increased significantly from the baseline mean IOP (T1), ($p<0,05$); in both groups.
Conclusions: The results of this study do not support concerns about a possible deleterious effect of laparoscopy surgery on intraocular pressure.
However, futher studies are necessary to rule out a possible negative effect of laparoscopy surgery on IOP in older patients with pre-existing eye disease.

Paper No: 712.00

Continuous registration of the evolution of anaesthetic depth during intravenous induction with thiopental

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Introduction: Hypnotic drugs bring about changes at the level of the central system. These alterations can be monitorized by means of processing techniques of the EEG signal. Upon these premises, both the Bispectral Index (BIS) and State Entropy (SE) have been recently developed. In both BIS and SE, those values between 40 and 60 indicate the lowest probability of explicit record during surgery, which is directly associated with the incidence of intraoperative awareness.
Goals: To determine if there are statistically significative differences between BIS and SE monitoring of anaesthesic depth during the intravenous induction with thiopental. To analize if these different types of monitorization separately constitute a valid model of continuous registration of the evolution of anaesthetic depth.
Methodology: Once the hypnotic agent has been administered, a decrease in the figures of both types of monitorisation is observed. At the same time, the patient loses his response capacity and his level of awareness is reduced. A minimum value is reached, which is lately recovered until it estabilizes both at the beginning and during surgery. SE and BIS initial and minimum values are recorded, as well as the moment when they occur. Once the registration is interrupted, the patient is intubated. Graphic records are submitted to statistic analysis.
Results: Statistically significative differences are found between initial and minimum values for both variables of monitorisation separately. Nevertheless, statistically significative differences between both registration procedures are not found. Both BIS and SE registrations have proved to be efficient for the monitorization of anaesthetic depth during the induction with thiopental in that group of patients. Statistically significant data in favor of one of the two variables of monitorization have not been found. Prospective research show that BIS intraoperative monitorization can reduce notably the incidence of intraoperative awareness, but investigations related to other monitors have not been published. Several studies suggest that SE constitutes a useful measure of propofol and sevoflurane drugs effects. These estimated results are similar to those of BIS, but no data related to thiopental drug effects have been found.
Conclusions: Since these BIS and SE monitors of anaesthetic depth are based on different types of analysis of electric signs coming from the brain, each monitor must validate its use by means of carrying out studies with high levels of evidence. Further research should be developed in order to determine the usefulness of both monitors of anaesthetic depth during intravenous induction with thiopental.

References

1 Kaskinoro K, *et al.* "Wide inter-individual variability of bispectral index and spectral entropy at loss of consciousness during increasing concentrations of dexmedetomidine, propofol, and sevoflurane." *Br J Anaesth.* (2011) **6**: 214–22.
2 Bruhn J, Bouillon TW, Radulescu L, Hoeft A, Bertaccini E, Shafer SL. "Correlation of approximate entropy, bispectral index, and spectral edge frequency 95 (SEF95) with clinical signs of anesthetic depth during coadministration of propofol and remifentanil." *Anesthesiology.* (2003) **98**(3): 621–7.

Paper No: 741.00

The Detection of Beta-Herpesvirus Infection in Patients undergoing Reconstructive Flap Surgeries and Its Association with the nearest Postoperative Period Course

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Introduction: Beta-herpesviruses HHV-6 and HHV-7 are ubiquitous immunomodulating viruses that can interfere with the function of the host immune system through a variety of mechanisms. HHV-6 and HHV-7 infect cells of immune system as an integral part of their life cycle. The aim of this study was to investigate the presence of HHV-6 and 7 HHV-7 in patients before prolonged reconstructive flap surgery and effect of this surgery upon general and regional anaesthesia on activation of HHV-6 and HHV-7 and how this activation affects postoperative period course.
Materials and Methods: 38 patients (aged 5-65) after long lasting (average 5.7h) reconstructive flap surgery were involved and split into 2 groups - general anaesthesia (GA) (n=17) and regional anaesthesia (RA) (n=21). Peripheral blood samples for the detection of latent or active viruses were collected from patients before and 10 days after surgery.

Results: Before the surgery latent HHV-6 was revealed in 8 patients (GA) and in 6 patients (RA), active HHV-6 in 2 patients (GA), in 1patients (RA). Latent HHV-7 was revealed in 11 patients (GA), in 13 patients (RA) and active HHV-7 - in 4 patients (GA) and in 4 patients (RA). In 5 patients (GA), in 3 patients (RA) concurrent latent HHV-6/ HHV-7 infection was found, in patient 1 (GA) it was active. After the surgery reactivation of HHV-6 was detected in 1 patient (GA), in (RA) no cases of activation. Reactivation of HHV-7 was detected in 4 patients (GA) in 1 patient (RA). Simultaneous reactivation of HHV-6/HHV-7 was detected in 1 patient (GA). Postoperatively (GA): 6 cases of unfavourable surgery (4 -surgical site infection (SSI), 2 - flap ischemia) were observed. Postoperatively (RA): 2 cases of SSI were observed. In 30 (78.94%) patients of both groups (RA and GA) to whom reactivation of the viruses after surgery was not revealed, 5 (17.7%) patients had unfavourable surgeries. In 5 (20%) patients to whom activation of the viruses after the surgery was revealed, unfavourable surgery was in 1 patient. In 2 patients (GA) with active HHV-6 viral infection already before surgery had SSI.
Conclusion: Despite the limited number of patients our study results suggests that the presence of HHV-6 and HHV-7 in our patients was high. Reactivation of HHV-6 and HHV-7 is more frequent in patients to whom general anaesthesia is applied. Our results suggest that reactivation of HHV-6 and HHV-7 is possibly related to longer and more complicated post-operative period.

Paper No: 754.00

Gloved practice of peripheral venous catheterization results in higher success rates

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Introduction: Standard precaution is recommended when clinicians are involved in minimally invasive procedures, however, many anesthesia providers do not wear gloves when administering venipuncture to raise their success rates. So far, there has not been any research done regarding the effects of gloves on success rates.
Objectives: The purpose of this study is to determine if the gloved practice of peripheral venous catheterization results in lower success rates as many anesthesiologists believe.
Methods: Fifteen trainees with less than 1 year of anesthetic experience participated in this study. Although the whole study was not randomized, participants were instructed to perform venipuncture by the following method to eliminate bias as much as possible. They were asked to count their administrations of peripheral venous catheterization, and on odd occasions to record their findings when wearing gloves, and on even occasions when not wearing gloves. They were also asked to record the size of the needle and the place of venipuncture. When there was a high risk of infection, they were allowed to wear gloves, ignoring the protocol. Failure or success was left to the discretion of the attending anesthesiologists. Pearson's chi-squared test (or Fisher's exact test) was utilized to assess the statistical significance of differences in success rates between groups. Statistical analysis was performed with StatView.
Results: A total of 226 attempts were recorded, 171 of which were successful attempts and 55 failed ones. Of 118 gloved practices, 96 (81%) resulted in success and 22 (19%) failure, on the other hand, among 55 bare-handed practices, 33 (60%) resulted in success and 22 (40%) failure. There was a significant difference in success rates between gloved and barehanded practice ($p<0.05$). Trials with 18G needles showed a significant statistical difference (100% v.s. 72%, $p<0.05$), success rates with 20G and 22G needles did not reach statistically significant levels.
Conclusions: The present study suggests the clear advantage of wearing gloves when administering venipuncture. This is the first study that showed increased success rates with gloved practice. There was a trend that barehanded practitioners try to cannulate deep and palpable, but invisible veins, whereas gloved practitioners try superficial and visible veins. It is highly possible that this trend led to increased success rates observed in the present study. Since gloves are the integral part of standard precaution, the results of this study are fairly encouraging. In conclusion, gloved practice of peripheral venous catheterization leads to higher success rates.

Paper No: 764.00

Utilization of operating room time in a cancer hospital: is there scope for improvement?

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Introduction: Optimum utilization of operating room (OR) time is necessary to decrease waiting lists and maximise cost-effectiveness. Audits have a role in identifying and improving inefficient OR utilization.1 - 3 We conducted an audit to assess the efficiency of use of OR time and to identify areas for improvement in elective surgical lists in a cancer hospital.
Methods: We prospectively studied elective major surgical cases carried out over two months in 13 ORs. Anesthesiologists filled a proforma for each patient including the following timings: entry into OR, start and end of anaesthesia procedures [regional anaesthesia, general anaesthesia,

invasive monitoring, specialized airway devices (fiberoptic intubation, lung isolation)], handover to surgeon, incision, end of surgery, start of reversal, end of anaesthesia, shifting out of OR and entry of next patient. Anesthesiologists were asked to document reasons for any delay which they felt was unusual. Completeness of data and accuracy of entries was verified by cross-checking a random sample of cases with the OR record book.

Results: Eight hundred and twenty eight surgeries were carried out during 428 OR days in the study period (median of 1.7 surgeries per OR per day). The median time of starting the OR list was 5 minutes after the scheduled start time with almost 20 percent (60 of 354) first cases entering the OR more than ten minutes late. The following median times were recorded: patient entry into OR to handover to surgeon (time taken for attaching monitors, securing intravenous access and routine general anaesthesia) - 20 minutes; additional procedures like regional anaesthesia, specialized airway and invasive monitoring - 20 minutes each; surgical preparation time – 15 minutes; turnover time between cases - 30 minutes. The median OR end time was 60 minutes after scheduled OR end time with 20 percent (70 of 349) last cases leaving the OR more than 2 hours after scheduled finish time. The induction room was utilized for procedures in only 15% of surgeries where it could have been used.

Conclusions: This audit identified areas of inefficiency in OR utilization such as inadequate utilization of induction room and long turnover times. Steps to correct these lacunae have been undertaken. Minimal delays seen in shifting patients into OR are unlikely to impact outcomes.

References

1 Saha P, Pinjani A, Al-Shabibi N, Madari S, Ruston J, Magos A. Why we are wasting time in the operating theatre? *Int J Health Plann Manage*. 2009; **24**: 225–32.

2 Ricketts D, Hartley J, Patterson M, Harries W, Hitchin D. An orthopaedic theatre timings survey. *Ann R Coll Surg Engl*. 1994; **76**: 200–4.

3 Haiart DC, Paul AB, Griffiths JM. An audit of the usage of operating theatre time in a peripheral teaching surgical unit. *Postgrad Med J*. 1990; **66**: 612–5.

Paper No: 767.00

Acute postoperative respiratory failure after resection of a substernal goiter. case report

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Introduction: Dysphonia is one of the rare complications of a substernal goiter surgery. This occurs when the vocal cord is paralised due the damage of the ipsilateral recurrent laryngeal nerve. When both recurrent laryngeal nerves are damaged, the result is acute respiratory failure. The damage may be temporary or permenant.

Objetive: The goal of this case report is to present an acute respiratory failure in a patient after a resection of a substernal goiter.

Case report: A 56 year old female, 70kg, ASA II, scheduled for resection of a substernal goiter. All preoperative exams were normal. Obtained peripheral venous access 18G, monitored by pulse oximetry, cardioscope and non invasive blood pressure. Received pre-oxygenation anaesthesia and was induced by propofol, fentanyl and cisatracurium. The intubation was successfully performed with a 7.5mm cuffed tube and was confirmed by the presence of carbon dioxide in the capnography. Anaesthesia was maintained with oxygen sevoflurane under mechanical ventilation. The duration of the procedure was 90 minutes. The patient was extubated in the operation room and taken to the recovery room where she presented increasing respiratory distress with laryngeal stridor, desaturation and agitation. As there was no improvement, she was intubated again. During the laringoscopy it was observed that the vocal cords were adduced and that the glottis was smaller than usual. After two hours in the recovery room she was extubated and once again, the patient wasn't able to breath properly. She had to be reintubated. She was taken to the intensive care unit and two days later another attempt of extubation failed. It was therefore decided to perform a tracheostomy. The patient remained this way for two months waiting for a new evaluation for permanent treatment.

Conclusion: During the resection of cervical tumors the recurrent laryngeal nerves can be damaged. This happens because they have an intimate anatomical proximity to the cervical structures. The bilateral paralysis of the vocal chords is caused by the damage to both laryngeal recurrent nerves which produces acute respiratory failure. This condition demands specialized treatment and follow up.

References

1 Tonelli D, Canga JC, Vasconcelos JC, *et al.* Lesão bilateral de nervos recorrentes. Insuficiência respiratória aguda após cirurgia de urgência:Relato de um caso. *Rev bras anestesiol*, 1989; **39**(4): 297–298

2 Maranhão MVM, Pinho Filho J Paralisia de prega vocal esquerda secundária à lesão do nervo laríngeo recorrente após cirurgia de ligadura do canal arterial. Relato de caso. *Rev bras anestesiol*, 2002; **52**(4): 453–456.

Paper No: 779.00

Enhanced recovery in liver resection surgery: a single-blinded randomised controlled trial

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Introduction: Enhanced Recovery Programs (ERP's) were first introduced in open colorectal surgery where they have been shown to reduce postoperative length of stay and complications [1,2]. However there is limited evidence to show whether they provide the same benefit in liver resection surgery. To date there have only been two small pilot studies [3,4] using some aspects of ERP's for open liver resection surgery. We have therefore designed a comprehensive ERP for liver resection surgery to see if short term recovery and morbidity can be improved with the introduction of such a program. These are preliminary results but full results will be available in March 2012.

Objectives: The main objective is to demonstrate that a comprehensive ERP, including goal directed fluid therapy, can significantly reduce post operative morbidity and length of hospital stay.

Methods: This is a single centre, blinded, randomised controlled trial (ISRCTN: 03274575), looking at adult patients undergoing elective liver resection. Randomisation was by means of sealed envelopes. Patients undergoing ERP received enhanced pre-operative education, perioperative carbohydrate supplement drinks, post-resection goal-directed fluid therapy (using LiDCOrapid™) and early mobilization and physiotherapy. Group allocation was unblinded to both patients and researchers, but to reduce bias both groups were treated using strict protocols. Two independent assessors (blinded to group allocation) assessed readiness for discharge using strict criteria including good pain control, tolerance of solid food, independently mobile, and normal biochemical variables. Morbidity was measured using POMS, an 18 item valid and reliable measure addressing nine domains of postoperative morbidity [5].

Results: So far, 41 out of 90 patients have been recruited to the study. Complete data collection has been completed on 26 patients. A significant reduction in length of stay has been achieved, associated with earlier tolerance of diet, independent mobilisation and morbidity. Full analysis will be presented in March 2012.

Age (yrs)	mean
55 (SD 10.8)	65 (SD 13.2)
Gender	M:F
8:7	7:4
Time until fit for discharge (days-mean)	
4.2 (SD 1.78)	7.1 (SD 2.4)
Postoperative length of stay (days)	
5 (SD 3.02)	7.5 (SD 2.5)

Operational Details Extended Right Hemi-hepatectomy:

	4	0
Right Hepatectomy:	2	1
Left Hepatectomy:	0	2
Trisegmentectomy:	2	0
Bisegmentectomy:	0	1
Segmentectomy:	2	2
Wedge resections:	5	5
Blood loss (mls-mean):	487 (SD 463)	346 (SD 308)
Morbidity:	1 (6.7%)	2 (15%)

Conclusions: Full analysis will be presented.

References

1 Levy BF, Scott MJ, Fawcett WJ, Rockall TA. 23-hour-stay Laparoscopic Colectomy. *Diseases of the Colon & Rectum July* 2009; **52**(7):1239-1242

2 The enhanced recovery after surgery (ERAS) pathway for patients undergoing major elective open colorectal surgery: a meta-analysis of randomized controlled trials. Varadhan KK, Neal KR, Dejong CHC, Fearon KCH, Ljungqvist O, Lobo DN. Clinical Nutrition 2010;29(4):434-440

3 The effect of a multimodal fast-track programme on outcomes in laparoscopic liver surgery: a multicentre pilot study. Stoot JH, van Dam RR et al. HPB 2009;11:140-144

4 Initial experience with a multimodal enhanced recovery programme in patients undergoing liver resection. Van Dam RM, Hendry PO et al. British Journal of Surgery 2008;95:969-975

5 The postoperative Morbidity Survey was validated and used to describe morbidity after major surgery. Grocott MP, Browne JP, Van der Meulen et al. J Clin Epidemiol. 2007;60(9):919-28

Paper No: 793.00

Liver transplants: a review of 81 cases performed at the wits donald gordon medical centre in south africa

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Introduction: Liver transplantation is performed at many medical centres worldwide. The Wits Donald Gordon Medical Centre (DGMC) initiated a liver transplantation program in Gauteng, South Africa in 2004. This audit evaluates the outcomes of the cases performed over the first 4.5 years.
Objectives: To ascertain (i) the morbidity and (ii) mortality of the adult othotopic liver transplantations.
Method: A retrospective record review of all adult orthotopic liver transplantation cases at Wits DGMC for the period from 16 August 2004 to 30 June 2009. Parameters captured included demographic factors, clinical data, MELD scores, admission SAPS III and SOFA scores, complications, 3 month and 1 year morality. Ethics approval was obtained from the University Human Research Ethics committee.
Results: 82 cases were identified and 81 analysed (one case was transferred to a separate ICU post -surgery). The mean age was 48.7 ± 10.5 years. The majority were males (58%) and the oldest case was 71 years old. The mean MELD score was 21.1 ± 10.4. The mean admission SAPS III and day 1 SOFA scores were 46.8 ± 14 (predictive mortality of 12%) and 8.9 ± 3.4 respectively. The mean cold ischemic time was 486 minutes. Three month mortality was 13.6 % (11/81) and mortality at 1 year post transplantation was 23.5% (19/81). For the first 25 cases the 3 month and 1 year mortality was 12%(3/25) and 0% respectively. There were 2 patients re-transplanted, both of whom demised. Mean ICU and hospital stay was 18.6 and 28.1 days respectively. Surgical complications occurred in 33.3% and 42.9% of the survivors and non survivors respectively ($p>0.05$). Medical complications occurred in 26.6% and 85.7% of the survivors and non survivors respectively ($p<0.05$).
Comment: A prospective evaluation would be beneficial to identify outcome predictors and influence patient selection and management in the future.

References

1 Belle S, Detre K, Beringer K. The relationship between Outcome of Liver Transplantation and Experience in New Centers. *Liver Transplantation and Surgery* 1995; **1**(6): 347–353

2 Freise CE, Gillepsie BW *et al.*. Recipient Morbidity after Living and Deceased Donor Liver Transplantation: Findings from the A2ALL Retrospective Cohort Study. *American Journal of Transplantation* 2008; **8** 2569–2579

Paper No: 796.00

The Effect of Bispectral Index Monitoring during Low Flow Sevoflurane Anesthesia

Wafaa Salem, Ahmed Bakeer and Mostafa Abdelrahman

Introduction: The use of bispectral index (BIS) was reported to insure adequate level of anesthesia when its value is maintained below 60. Low flow sevoflurane anesthesia was found to be safe with effective reduction in its consumption.
Objectives: The aim of study was to evaluate the effect of Bispectral Index Monitoring on consumption and recovery during low flow sevoflurane anesthesia.
Methods: 100 cancer patients undergoing pelviabdominal surgery were divided into 2 groups; control (C) group 50 patients and bispectral index (BIS) group 50 pts. Standard premedication and induction were used in both groups. Muscle relaxation and analgesia was maintained with continuous infusion of atracurium and fentanyl. Depth of anesthesia required was met by increasing or decreasing Sevoflurane concentration. Sevoflurane was given in oxygen/air at concentration of 2.6% (1.3 MAC) with a fresh gas flow of 5 L/ min for10 min then decreased to 1 L/ min. Ten minutes before end of the surgery, sevoflurane was stopped and fresh gas flow was increased to 5 L/ min. In the control (C) group, no BIS were used and sevoflurane was adjusted according to standard clinical practice (ETAG 0.7-1.3 MAC). In the bispectral index (BIS) group, BIS Sensor was applied to the forehead of each patient and sevoflurane was adjusted to keep BIS value between 60-40. BIS values were recorded every 10 min in (BIS) group and ETAG levels were recorded every10 min in both group. Recovery times were also recorded.
Results: There were no significant differences in baseline characteristics between the two groups. During the maintenance of anesthesia, the mean time-averaged BIS value was 48.1¡À2.2 in (BIS) group.
The mean (¡ÀSD) time-averaged ETAG concentration was significantly less in (BIS) group compared to (C) group (0.74¡À0.15 MAC and 0.89¡À0.33 MAC respectively) ($P<0.05$). Time to emergence, extubation time, time to respond to command and time to eligible for recovery discharge (modified Aldretès score of ¡Ý 9) were significantly shorter in the BIS group compared to control group (6.1 ¡À 0.3, 8.3¡À0.57min -7.3 ¡À 0.6, 10.1 ¡À 0.5 min - 9.1¡À0.60, 13.7 ¡À 1.0 min - 65.4 ¡À 5.0, 81.6 ¡À 3.3 min respectively) ($P<0.05$).
Conclusions: It is an advantage to use bispectral index (BIS) monitoring, as it allows more reduction in sevoflurane consumption with significant reduction in recovery times. This benefit would be more important in critical ill patients but the cost of BIS monitoring should be considered.

References

1 Alejandro Recart, MD, Irina Gasanova, PhD MD, Paul F. White, PhD MD, Tojo Thomas, MS, Babatunde Ogunnaike, MD, Mohammed Hamza, MD and Agnes Wang, MS (2003) :The Effect of Cerebral Monitoring on Recovery After General Anesthesia: A Comparison of the Auditory Evoked Potential and Bispectral Index Devices with Standard Clinical Practice A & A December vol. 97 no. 6 1667–1674

2 Odin I and Feiss P (2005): Low flow and economics of inhalational anesthesia. Best Pract Res clin Anesthesiol. Sept; 19(3): 399-413.

3 Alderet JA (1995): The post-anesthesia recovery score revisited. J Clin Anesth. Feb; 7(1):89–91

Paper No: 802.00

Interpleural block associated to general anesthesia and endovenous lidocaine in breast cancer surgery- clinical experience

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Introduction: Surgical resection of the primary tumor is a necessary and effective treatment for breast cancer patients, but it is usually associated with immune system dysfunction, including anesthetic and analgesic agents. Some of these agents, such as opioids, administered throughout the surgery and following it, have been shown to contribute to postoperative suppression of cell-mediated immunity, and can thus promote the metastatic process.
Objectives: Report the beginning of clinical experience with interpleural block associated to general anesthesia and endovenous lidocaine in breast cancer surgery, in order to reduce disease recurrence and metastasis.
Methods: Fifteen cases of females with breast cancer, submitted to mammary axillary dissection under interpleural block associated to general anesthesia and endovenous lidocaine, were reported in this study.
Results: Fifteen females with breast cancer took part in this study (age 42-66, weight 55-81 kg, ASA P1 and P2). They were submitted to mammary axillary dissection under interpleural block with levobupivacaine 0,5% (100mg) with adrenaline 1:200000 associated to morphine (3mg), clonidine (3 μg.kg-1) and general anesthesia kept with isoflurane (<1,5vol%). Anesthetic induction was performed with etomidate (0,2mg.kg-1), alfentanil (30 μg.kg-1) and rocuronium (0,6mg.kg-1). Lidocaine 1% (10 μg.kg-1.min) was used in continuous infusion. There was a significantly reduced need of inhalatory anesthetic during intraoperative and no need of opioid association in intra or postoperative. The postoperative treatment of pain was venously performed only with metamizole (15mg.kg-1 6/6h). These patients will continue to be followed to verify disease recurrence or metastasis.
Discussion: Anesthetic agents and analgesic, administered throughout the surgery and following it, have been shown to contribute to postoperative suppression of cell-mediated immunity, and can thus promote the metastatic process. Opioids inhibit both cellular and humoral immune function in humans. When combined, the addition of regional block to general anesthesia, the amount of general anesthetic required is greatly reduced, as well as the quantities of postoperative opioid analgesia. Paravertebral and epidural blocks for breast cancer surgery markedly reduces the risk of recurrence or metastasis during the initial years following the surgery. Regional techniques, such as interpleural block, are easy to implement, inexpensive, safe and efficient. Clonidine (á2-adrenergic agonist) reduces significantly the development of postoperative metastasis in young animals. Intravenous lidocaine in intraoperative improves immediate postoperative pain management and reduces surgery-induced immune alterations.
Conclusions: Anesthesiologists should search and select anesthetic methods during breast cancer surgeries perioperative regarding the optimal prognosis and aiming to reduce the risks of disease recurrence and metastasis.

References

1 Goldfarb Y, Ben-Eliyahu S. Surgery as a Risk Factor for Breast Cancer Recurrence and Metastasis: Mediating Mechanisms and Clinical Prophylactic Approaches. *Breast Disease*, 2006, 2007; **26**:99–114.

2 Kurosawa S, Kato M. Anesthetics, immune cells, and immune responses. *J Anesth*, 2008; **22**: 263–277.

3 Sessler DI. Does regional analgesia reduce the risk of cancer recurrence? A hypothesis. *European Journal of Cancer Prevention*, 2008; **17**: 269–272.

Paper No: 816.00

Effect of third –generation perfluorocarbon on genes regulation in DCD liver graft preservation model

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Introduction/Objectives: Preservation of the liver graft in a standard University of Wisconsin solution (UW) has not

Table 1

1	4	489	62 (13%)	427 (87%)
2	10	201	42 (21%)	159 (79%)
3	10	140	44 (31%)	96 (69%)
4	10	97	63 (65%)	34 (35%)
5	10	150	55 (37%)	95 (63%)

Table 2

Gene	Group2		Group3		Group4		Group5	
RT1-A1	16.5	p=0.048	18.2	p=0.045	24	p=0.034	16.8	p=0.048
AOX3	5.5	p=0.002	7.55	p= 4.5x10-5	8.4	p=2.68x10-4	7.1	p=1.2x10-4
A2Id1 none	6.5	p=0.002	8.2	p=5.9 x 10-4	5.8	p=3.8 x 10-4		
Mrpl18_pred	7.3	p=0.001	none	8.7	p=.0015	none		

always been adequate for Donation after Cardiac Death (DCD). We investigated the effects of two third-generation perfluorocarbons (PFC), perfluorodecalin liquid (PFD) and its emulsion (PherO2), on hepatic genes expression in the model of liver preservation. Methods: DCD model* consisted of 30 min warm-ischemia (cardiopulmonary arrest), flush of liver with cold UW +/- PFC and preservation in cold solution for 8hrs. Control group consisted of 3 rats with organs harvested but not preserved. Group1 - liver preserved in UV without perfusion; Group 2 - liver preserved in oxygenated UW with perfusion; Group 3 - 5 minutes before cardiac arrest 2 ml of PherO2 administered into portal vein; Group 4 – preserved in 11% PherO2/UW (with perfusion); Group 5- preserved in 11% PFD/UW (with perfusion). Illumina RaRef12 BeadChip microarrays were used to monitor 22,519 mRNA transcripts in the liver. Results: Table 1 shows the effect of different preservatives on total number of hepatic genes and relative ratio of up and down regulated genes (Volcano analysis) with significantly changed mRNA expression (by factor of at least 1.5 and $p<0.05$) when compared to control. Group N Genes with significantly Up-regulated genes Down-regulated Genes changed expression

Groups were significantly different (p between 0.027-0.0001) with exception of Group 3 and 5 comparison (p= 0.34) by Chi2. Table 2 shows examples of up regulated genes (shown as relative increase in expression when compared to control.

Conclusion: Preservation of the rat liver in UV significantly changes expression of several hepatic genes. Perfusion with oxygenated UW and in particular addition of PherO2, produces significant decrease in down and increase in up-regulation of hepatic genes. The decrease in down regulated hepatic genes may be interpreted as unspecific protective effect against ischemia-or cold-induced damage of functional genes. The increase in up regulation of several, presumably protective genes, can potentially improve preservation outcomes.

Reference

1 Bezinover D, Ramamoorthy S, Uemura T, Kadry Z, McQuillan PM, Mets B, Falcucci O, Rannels S, Ruiz-Velasco V, Spiess B, Liang J, Mani H, Lou X, Janicki PK. Use of a Third-Generation Perfluorocarbon for Preservation of Rat DCD Liver Grafts. *J Surg Res*. 2011 Apr 9. [Epub ahead of print]

Paper No: 817.00

The secret behind good job- and life satisfaction among finnish anesthesiologists

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Introduction: According to our previous studies, Finnish anesthesiologists are stressed and have a high on-call burden, but enjoy fairly good job- and life satisfaction. Job control and organizational justice were the most important correlates of job satisfaction and social support of life satisfaction.

Objectives: To investigate determinants of very good job- and life satisfaction despite high levels of stress, on-call burden and on-call-related stress symptoms.

Methods: We performed a cross-sectional postal survey including all 550 working Finnish anesthesiologists in 2004. The response rate was 60% (n=328); 53% were men. The questionnaire included in addition to demographic items questions on self-rated health, stress, on-call burden, stress symptoms, job control, organizational justice, conflicts at the workplace, social support, friends, family problems, traumatic life events, and health behavior. The outcomes were assessed with the questions “Do you feel you can get satisfaction from your work?” (never, sometimes, often, always) and “How satisfied are you generally with your life?” (very unsatisfied, fairly unsatisfied, fairly satisfied, very satisfied).

Results: Seven percent (n=22/323) of the respondents were always satisfied with their job and 29% (n=95/324) with their life. Of the always job-satisfied, 32% were moderately stressed, 64% had a moderate on-call burden, and 44% had on-call stress symptoms. The respective figures for very life-satisfied were 48%, 64%, and 51%. The buffers against stress and related symptoms enabling very good job- and life satisfaction were good social support, lack of family problems, high job control, good health, and modest consumption of alcohol. (The range of contingency coefficients reaching significance was 0.12-0.26.)

Conclusions: The secret of very good job- and life satisfaction among Finnish anesthesiologists despite high work-related

stress lies in good family and social support, good health, and healthy behavior.

References

1 Lindfors PM, Nurmi K, Meretoja OA, Luukkonen RA, Leino TJ, Viljanen A-M, Härmä M. On-call stress among Finnish anaesthetists. *Anaesthesia* 2006; **61**: 856–866.

2 Lindfors PM, Meretoja OA, Töyry SM, Luukkonen RA, Elovainio MJ, Leino TJ. Job satisfaction, work ability and life satisfaction among Finnish anaesthesiologists. *Acta Anaesthesiol Scand* 2007; **51**: 815–22.

3 Lindfors P. Work-related well-being of Finnish anesthesiologists. Doctor's thesis. Helsinki University, 2010.

Paper No: 821.00

Descriptive study of mortality in abidjan burn care unit

Patrice Assouakon, Brigitte Vilasco, Kouame Kouame, Evariste Chatigre and Jacques Sissoko

Introduction: Burn is responsible for a high mortality rate, particularly in developing countries[1].
Objective: To describe the epidemiological aspects of patients with burns injuries who died during admission.
Patients and methods: Retrospective and descriptive study during 66 months, from January 2005 to June 2010 in the Center for burns treatment in Abidjan.
All patients admitted for burn injury, and who died in the service. Patients not reviewed were excluded.
Data studied were age, sex, circumstances of burns, the burn body skin area (BBSA) using Berkow table in adults, and Lund and Browder table in the child, depth, time of admission, the time of death after burns, the cause of death.
Results, expressed in frequencies, and median value with dispersion index. Epi info 3.5 for Windows for data analysis.
Results: 2716 patients were admitted. 794 were hospitalized.242 died. 594 (21.61%) were not reviewed.
The overall mortality rate was 8. 91%. The specific mortality rate for thoses admitted was 30. 47%.
Sex-ratio was 1.2 with 56.20% male and 43.80% female
50.42% were under 15 years.(Range: 2 months to 85 years).
Etiologic agent was flames in 44.6% due to explosion of gas cylinders of 12 kg and 6 kg or when using gasoline to light the hurricane lamp. Boiling water was responsible in 31%. Domestic accident in 77.4% of cases.
The median percentage of BBSA was 36.25%. (Range 1 to 100%).
The burns were superficial in 18.8% of cases, and deep in 35.1% of cases.
56.7% of patients were admitted the day of the burn occurred. Range 0 to 52 days.
The median time of death was 6 days. Range 0 to 302 days.
Discussion: The high mortality rate in our series (30.47%) is found in most developing countries. Morocco (35%), Nigeria (30%), Ivory Coast in 1993 (40.4%).[1,2,3,4]
Domestic accidents account for the relatively young age of patients. The time of admission is due to the ignorance of the existence of the center by the majority population.
Conclusion: Burns remains potentially serious accident, involving life-threatening.
Particular emphasis should be placed in the education of the population to minimize the incidence of domestic accidents.
Improving medical and paramedical staff in management of burns may improve the prognosis of patients burned by a rapid and appropriate care.
Prevention remains the best way to fight against these accidents. However, it must take into account the traditions and local socioeconomic conditions.

References

1 Boukind L et al : Etude de la mortalité par brûlure à propos de 414 cas de décès. Annals of Burns and Fire Disasters- Vol. VIII n.4 December 1995

2 R.S. Hosseini, M. Askarian and O. Assadian: Epidemiology of hospitalized female burns patients in a burn centre in Shiraz. Eastern Mediterranean Health Journal, Vol13, No1, 2007

3 Vilasco and Bondurand: Burns in Abidjan, Côte d'Ivoire. Burns, vol.21, No4, 291-296, 1995

4 SivaRam Ganesamoni, Vikram Kate, Jagdish Sadasivan. Epidemiology of hospitalized burn patients in a tertiary care hospital in South India. Burns 36 (2010) 422–29

Paper No: 823.00

Microstructure of human airway mucus in smokers vs. non-smokers

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Introduction: Most infections start at mucosal surfaces. Pathogens must first diffuse across the viscous and elastic (solid-like) mucus gel to reach target cells. Little is known about how most pathogens behave in mucus. The host defense barrier mechanism of mucus in the lung, including its ability to trap foreign particles and eliminate them via mucociliary clearance, is intimately coupled to the microstructure of airway mucus (AM) secretions. Most prior studies have relied on electron microscopy to visualize the mucus mesh, which is subject to numerous artifacts due to dehydration and/or fixation steps, and have produced a wide range of estimates. Here, we report the microstructure of human AM by overcoming these shortcomings.
Objectives: By collecting mucus from endotracheal tubes of patients undergoing surgery and measuring the mobility of different size nanoprobes engineered with coatings inert to mucus constituents, we report quantitative comparison of

the pore sizes in mucus collected from smokers vs. non-smokers.
Methods: We collected undiluted and minimally altered AM by sectioning the tips of endotracheal tubes from patients undergoing surgery. The secretions on the tube surface were collected by light centrifugation. This resulted in collection of 0.3–1 ml of mucus in many subjects. We then quantified the microstructure of the mucin mesh in AM secretions by quantifying the motion of hundreds of nanoparticle probes of different sizes, all engineered with a coating that minimizes their adhesion to mucus constituents. This technique does not require any fixation or dehydration, and thus enables pore size measurements of physiological AM secretions.
Results: The vast majority of samples immobilize 500nm beads, but not 100-200nm. This contrasts sharply with results observed in human cervicovaginal mucus (average pore size $\sim 340 \pm 50$ nm), suggesting the pore sizes in AM is likely substantially smaller. The average pore size is 248 ± 146 nm and 138 ± 15 nm for non-smokers and smokers, respectively. Data represent the ensemble average of at least three independent experiments, with $n > 100$ particles tracked for each experiment. Also, one in three antibodies in AM appeared to be specific for H3N2 influenza.
Conclusion: We report a quantitative comparison of the pore sizes measured in AM samples collected from patients who are smokers vs. non-smokers. As secondary outcomes, we also expect to report the duration of intubation on the mucus pore size.

References

1 Lai SK, *et al.* Nanoparticles reveal that human cervicovaginal mucus is riddled with pores larger than viruses. *Proc Natl Acad Sci U S A*, 2010; **107**(2): 598–603.
2 Lai SK, *et al.* Rapid transport of large polymeric nanoparticles in fresh undiluted human mucus. *Proc Natl Acad Sci U S A*, 2007; **104**(5): 1482–7.

Paper No: 830.00

Manual jet ventilation in difficult airway by the presence of laryngeal web

Andrade Méndez José, **Allub Juan Martin** and Razetti Juan Zanetta Adrián

Introduction: manual jet ventilation is a resource used to maintain ventilation when the airway is compromised. An anatomic abnormality of genetic origin, the laryngeal web, located above the vocal cords causes decreased glottis opening, dysphonia, stridor, respiratory failure, difficulty in tracheal intubation.
Objectives: to describe the anesthetic technique and manual jet ventilation in cause of difficult airway due to the presence of laryngeal web.
Material and Methods: A 5 years old patient, female, 19.2 Kg 115 cm tall, endoscopic diagnosis of laryngeal web. History of forked soft palate at birth and respiratory disorders, repair surgery, and difficulty of intubation in that occasion, neck CT indicates decreased tracheal caliber below glottis. Monitoring: ECG, Pulse Oximetry, NIBP, Capnography (interrupted during jet ventilation). Inhalatory general anesthesia with face mask and spontaneous ventilation until obtain venous access. Through intravenous cannula #20 is used TIVA: propofol dose decreasing from 8, 6 to 4 mg/kg/h, remifentanil 0.25 to 0.50 mcg/kg/min; dexmedetomidine 0.4 mcg/kg/h; dipyrone 20 mg/kg. Muscle relaxation with atracurium 0.5 mg/kg for laryngoscopy and 0.3 mg/kg maintenance. GlaDeScope for laryngoscopy, nasotracheal intubation with Cook catheter airway exchanger 8.0 Fr/45 cm with Rapi Fit adapter, manual jet ventilation using Manujet III to 2 BAR (30 psi) pressure as recommended by the manufacturer, manual respiratory rate 25 per minute, double lung auscultation and chest expansion visually track with each breath. Results: the surgical procedure was finalized successfully, committed glottis region was repaired by using cold instruments, allowing the introduction of the endotracheal tube of adequate number for the age of the patient.
Discussion: the regulation of output pressure of oxygen in the Manujet III makes it possible to keep the airway intact and not cause barotraumas.
Conclusions: The manual jet ventilation through the catheter exchanger ensures air permeability, allowing adequate space for the surgeon to perform surgical maneuvers. Total intravenous anesthesia is the technique that provides better stability flat during procedures that require this ventilation.

1 The anterior laryngeal webs. Nicollas R, Triglia JM. Otolaryngol Clin North Am 2008 Oct;4(5)877-88
2 Congenital laryngeal webs: surgical management and clinical embryology. Milczuk HA, Smith JD, Everts EC. Int J Pediatr Ottorhinolaryngol 2000 Jan 30; 52(1):1-9.
3 Congenital glottic webs in children. A retrospective review of 51 patients. Ann Otol Rhinol Laryngol Suppl 1985 Nov-Dec; 121:2-16.

Paper No: 831.00

Osler Weber Rendu disease, endonasal laser surgery and anesthesia

José Andrade Méndez, **Florencia Bolla** and Federico Urquiola

Introduction: Osler Weber Rendu disease, also known as Hereditary hemorrhagic telangiectasia (HHT), is a multisystemic vascular displasia, autosomal dominant, typically identified by the presence of telangiectasia, recurrent epistaxis and multiorgan arteriovenous malformations (AVMs) often associated with hemorrhage. Multiple epistaxis occur at early ages, and may result in iron deficiency anemia. Nasal coagulation and cauterization with endonasal laser over the telangiectasia is an effective treatment.

Objectives: Description of 3 cases of Weber Osler Rendu disease, endonasal laser surgery and anesthetic management. Material y Methods: Case 1: A 62 year-old woman, 55 Kg, smoker for 32 years. Recurrent epistaxis, nasal telangiectasias, left parietal brain abscess drainage, pulmonary embolism, superior vena cava filter placement, treatment of pulmonary arteriovenous fistulas, stroke and angiografic treatment of brain arteriovenous malformations. Gastroduodenal telangiectasia. Case 2: A 59 year-old woman, 44 Kg, 1,65 mts height, BMI 16,16. Recurrent epistaxis, chronic anemia that often requires iron supplements and blood transfusions. Arterial hypertension, total gastrectomy, Acute myocardial infarction (2005), coronary stent. Case 3: A 50 year-old woman, 66Kg, 1,69 mts height; BMI 23,11. Epistaxis since 8 years old. Hepatic vascular malformations. Iron and folic acid replacement. Arterial hypertension. History of endonasal laser surgery.
Anesthetic Technique: Peripheral venous Access, continuous ECG monitoring, pulse oximetry, capnography, invasive arterial blood pressure monitoring (case 1), non invasive blood pressure monitoring (case 2 and 3), temperature measurement. Balanced general anesthesia. Premedication with Midazolam 0,2 mg/kg; induction with Propofol 2 mg/kg, muscle relaxation with Vecuronio 0,1mg/kg, maintenance with Sevofluorane 1,5% Fi02 0,5%, fresh gas flow 1 liter per minute. Remifentanil 0,25 mcg/kg/min; Dexmedetomidine 0,4 mcg/kg/h. Endotracheal intubation with reinforced endotracheal cuffed tube 7.5 Respiratory frequency 10-12 per minute, PEEP 5 cmH2O. The endonasal laser surgery used Argon Plasma 60 watts and 1,2 liters per minute (case 1) and Neodymiun YAG 20 watts in continue pulse mode to 0,5 seconds (cases 2 and 3)
Results: Procedures developed without complications, anesthetic technique kept optimal surgical conditions, induced hypotension to prevent bleeding. Discussion: Anesthetic technique must prevent bleeding and keep hemodynamic parameters stable.
Conclusions: The endonasal laser produces an hemostatic effect by thermal desvitalization of pathological tissue. The knowledge of the patient's illness with HHT and the anesthetic technique provide safety to the patient. Bibliography: Anesthetic management of a patient with hereditary hemorrhagic telangiectasia (Rendu-Osler-Weber syndrome). Case report. Goulart AP, Moro ET, Guasti VM, Colares RF. Rev Bras Anestesiol. 2009 Jan-Feb;59(1):74-8 Anesthetic considerations for the patient with hereditary hemorrhagic telangiectasia (Osler-Weber-Rendu syndrome). Peiffer KM. AANA J. 2009 Apr;77(2):115-8
KTE-532 laser-assisted endoscopic nasal sinus surgery. Gerlinger I, Lujber L, Jarai, T, Pytel J. Clin Otolaryngol 28:67-71 (2002).

Paper No: 836.00

Hemodynamic changes in liver surgery with intrathecal morphine versus epidural local anesthetics: a prospective comparative study

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Introduction: Combined anesthesia for mayor liver surgery is controversial. Those controversies are focused in the postoperative coagulopathy and in the fact that epidural local anesthetic inhibit sympathetic system that might be necessary to compensate preload changes in during the surgery. Comparative studies suggest that arterial pressure might be affected by epidural anesthesia (1). Intratecal morphine and epidural local anesthetics plus morphine are both effective and safe for pain relief (2).
Objectives: Compare medium arterial pressure (MAP), central venous pressure (CVP) and cardiac rate (CHR) during preload variations (mobilization of the liver and vascular clamping) in patients operated from mayor liver surgery with two different anesthetic techniques: combined general-spinal morphine (M) versus general-epidural local anesthetics and morphine (M-LA). Compare the postoperative pain, bleeding and fluid replacement of both groups.
Methods: Patients that underwent hepatic resection with mobilization of the liver and vascular clamping, meet criteria for combined anesthesia (regional-general) and gave consent we assigned to one of the groups: M=11 patients and M-LA=10 patients. Data were collected after Istitutional Scientific Board acceptance. Demographic and surgical characteristic were similar in both groups. After the regional anesthesia (M or M-AL), general anesthesia was induced with fentanyl, propofol and muscle relaxant. Central and arterial lines were placed in all patients. Hemodynamic data (MAP-CVP-CHR) were collected at the induction of the anesthesia, previously to the liver mobilization, previously to the vascular clamping and 10 minutes after both maneuvers. Postoperative pain was evaluated with the visual analogue score (EVA) at 10 minutes, 6, 12 and 24 hours postoperative.
Results: No significant differences were found between the two groups in MAP or CHA, even though a mild lower MAP was noticed in every moment of the surgery in M-LA group. Those parameters were not affected by liver mobilization or clamping. CVP was similar in both groups but a significant

decreased was registry in the M-LA group with the clamping maneuver (p=0.031). Pringle maneuver was associated with lower CVP than Right or Left clampings. All patients were extubated at the end of the surgery. Pain relief was better in the M-LA group (p=0.019). Bleeding was similar in both groups (M:540 ± 705mL; M-LA:490 ± 529mL) as well as fluid replacement with colloids (M:472 ± 527mL; M-LA:650 ± 529mL) and crystalloids (M2954 ± 950mL; M-AL:3160 ± 930mL).

Conclusions: Preload diminishing during vascular clamping is potentiated by epidural technique but that doesńt affect hemodynamic stability. Epidural catheter is more effective as postoperative analgesic in the first postoperative day.

References

1 Siniscalchi A. Minerva Anestesiologica,2003-Dec; **69(12)**:885-95.
2 De Pietri L. Anesth Analg,2006-Apr; **102(4)**:1157-63.

Paper No: 867.00

Quitting smoking before surgery. Where can we act?

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Introduction: The link between smoking and postoperative complication is well documented across surgical specialities 1. Not only is there an increased mortality risk, but also other complications including pulmonary, respiratory, wound infections, delayed wound healing and reduce bone fusion 2. Smoking has been associated with length of time in intensive care, in recovery from surgery and on ward 3. With many hospitals becoming smoke-free environments and the availability of effective interventions to help people to stop smoking, the preoperative period is an ideal time to help smokers to quit before being admitted to hospital. The Royal College of Anaesthetists advises smokers undergoing surgery to quit as far in advance of their surgery as possible, preferably a minimum of six week, or, if this is not possible, to not smoke in the day of the operation.

Objectives: To determinate the prevalence of smokers in the population of a tertiary university hospital to know where can we act to help smokers undergoing surgery to quit.

Methods: We evaluate the data base of preoperative evaluation of 41420 patients in a tertiary university hospital to determine the prevalence of smoker population. Secondary outcome was surgery adult's subspecialties in smoker group to know where the majority of smokers is. Results: We designed an observational non interventional study that included 41420 patients. 8283 were smokers (14%) and 8251 were ex smokers (14%). 189 smokers were under 20 years (2,3%) mainly scheduled to urological and trauma surgeries, 945 has 21 to 30 years (11,4%), 1371 31 to 40 years (16,5%), 1885 has 41 to 50 years (22,7%), 1752 has 51 to 60 years (21,7%), 1236 has 61 to 70 years (14,9%), 724 has 71 to 80 years (8,8%), 115 has 81 to 90 years (1,4%) and 4 smokers were over 90 years (0,05%) mainly eye surgery in the last two groups. We find a linear relationship between the presence of smoker and alcoholic, with an increase according to age group with a peak between 51-60 years. In the majority group (41-50yrs), surgery indication was 22% general surgery, 12,4% ENT procedures 12,4%, neurosurgery 9,7% and 7,9% vascular surgery.

Conclusions: We find a peak of smokers between the age 41 to 50 years with a 22% of prevalence and direct relationship between smokers and alcoholic. 60% of smokers group was scheduled to general, trauma, ENT, vascular and neurosurgery and these groups will be more profitable to deal.

References

1 Krueger JK, Rohrich RJ. Clearing the smoke: the scientific rationale for tobacco abstention with plastic surgery. *Plast Reconst Surg* 2001; **108**: 1063–73.
2 Furlong C. Smoking cessation and its effects on outcome of surgical intervention. London Health Observatory and Barnet PCT, 2005. www.LHO.org.uk.
3 Moller AM, Villebro N, Pedersen T, *et al.* Effects f preoperative smoking intervention on postoperative complications: a randomised clinical trial. *Lancet* 2002; **359**: 114–7.

Paper No: 884.00

Transcatheter aortic valve implantation: anesthetic management and considerations

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Introduction: Aortic stenosis (AS) is the most common form of adult valvular heart disease.1 Many patients with severe AS and multiple comorbidity conditions are not candidate for surgical replacement of the aortic valve, which is currently the gold-standard treatment. Transcatheter aortic-valve implantation (TAVI) has been suggested as a less invasive treatment for high-risk patients with AS.

Objective: The aim of this study is to report the anesthetic considerations and management in the first nineteen TAVI with the CoreValve Revalving™ system.

Methods: Patients with severe AS who had been refused surgery because of comorbidity were enrolled. Nineteen high-risk surgical patients underwent TAVI between march 2009 and august 2011, under general anesthesia. The induction and maintenance of anesthesia was done avoiding bradycardia or tachycardia, maintaining systemic vascular resistant and preserving preload. A general anesthetic was tailored to achieve extubation after procedure completion, whereas IV access and pharmacological support allowed for sudden hemodynamic changes, emergent sternotomy

and initiation of cardiopulmonary bypass. Aortic balloon valvuloplasty was performed first under rapid ventricular pacing and then retrograde CoreValve was implanted. Transesophageal echocardiography (TEE) was performed to confirm the diagnosis, determine ventricular function, annulus size, aortic pathology, and mitral regurgitation. It evaluated the Corevalve function, measured aortic regurgitation and assessed for aortic dissection, pericardial effusion and myocardial ischemia.
Result: Patients were 79 ± 7 years (63%male), with multiple comorbidities (EuroSCORE=22,16 ± 9,74%). Patients who survived to the procedure (94,7%) were extubated and transfer to intensive care unit without vasoactive or inotropic infusions. The most common in-hospital complications were third degree atrioventricular block (42,11%) and need for permanent pacemaker (26,32%). One patient underwent aortic valve replacement after TAVI because of symptomatic severe perivalvular leak. No patient required intraoperative transfusions. After a mean follow up of 317+-263 days, the rate of survival was 89,47%. Early hospital discharge was not always possible because of the comorbilities, been an average of 8,1 ± 6,9 days. Conclusion: Corevalve TAVI procedure in high risk patients appeared feasible and safe. Anesthesiologists have to manage critical patients with severe cardiac and noncardiac comorbilities applying the expertise to a novel procedure.

References

1 Eur Heart J. 2003; **24(13)**:1231-43

Paper No: 893.00

Clinical trial on burning sensation and pain with the propofol injection: new formulation

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Background: The anesthesia with propofol is one of the most common anesthetic combinations in the clinical practice. A disadvantage of this induction agent is that it produces pain with the injection. It might cause distress to the patients and it is considered a severe clinical problem in anesthesia. Several interventions to reduce or prevent the pain of the injection have been attempted, and a systematic review does not show which one of these interventions appears to be effective.
Goal: Compare the effects in the injection zone (pain - burning sensation) of the propofol "new formulation" (a new formula with a different vehicle) with other commercial ratios of propofol with or without the addition of intravenous lidocaine. Alternative hypothesis: Prove that the Propofol "new formulation" unlike other commercial ratios of propofol - with or without the addition of intravenous lidocaine associated – does not produce burning in the injection zone.
Methods: Double-Blind randomized and controlled clinical trial. We recruited 150 patients who underwent different surgeries. Those patients who required the administration of previous anesthetic medication were excluded. They were randomized into three groups: PC: Propofol control, PNF: Propofol new formulation, PL: Propofol with lidocaine (40 mg every each 200 mg of propofol). A teflon catheter 20 or 18 G was placed and 2 mg/kg of propofol was injected. Symptoms were registered (absence of pain, sensation of presence; light, moderate and severe pain). The Chi-square test was applied for the analysis of categorical data, considering significant a p "lower" than 0.05. Being a multiple comparison, the Bonferroni Criterion was applied (chart r x c).
Results: 44% of the patients who received PC, 57% of those who received PNF and 68% of the PL group (p=0.044) did not experience pain. On the other hand, 4% of the PL, 8% of the PC and 20 % of the PNF (p=0.021) underwent severe pain.
Conclusion: Comparing the formulations used in the studied sampling and agreeing with the systematic review, there is no evidence that the new formulation is exempted of producing burning sensation or pain when administered. As regards the alternative hypothesis, the new propofol formulation does not provide advantages on the conventional presentation with the addition of lidocaine.
Words: 363 Revisión Sistematica. P Picard, MR Tramèr. Prevention of pain on injection with propofol: a quantitative systematic review. Anesthesia and Analgesia 2000 90: 963-969. Revista Brasileira de Anestesiologia. Jan./Feb. 2007, vol.57, no.1, p.32-38 EL-RADAIDEH, Khaled M. Effect of pretreatment with lidocaine, intravenous paracetamol and lidocaine-fentanyl on propofol injection pain: comparative study

Paper No: 895.00

Dependence of hemodynamics on dalargin application in different types of anesthesia in patients with concomitant cardiovascular diseases

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Introduction: For the optimization of the anesthetic providing of the vast surgery apply the medication with special stressprotection properties, for example, dalargin that is synthetic analog of neuropeptid leu enkephalin.
Objectives: to determine the dependence of the hemodynamic changes on application of dalargin (synthetic analog of leu-enkephalin) as a component of different types of anesthesia in patients with concomitant cardiovascular disease.

Methods: 93 patients of the age from 30 to 80 years have been operated for gastrointestinal diseases. 53 patients had concomitant ischemic heart disease(IHD), 27 had arterial hypertension (AH), and 13 had a combination of IHD and AH. All patients had ASA class II-III. Patients were divided into groups: during anesthesia applied dalargin (n=48) and didn't apply dalargin (n=45). **Premedication:** diazepam 0.14 mg/kg, atropine 0.01 mg/kg. Surgery were performed under total intravenous anesthesia (TIVA; n=29; diazepam, ketamine, fentanyl), or a combination of TIVA with epidural analgesia (EA n=21; 0.5% ropivacaine), under volatile anesthesia sevoflurane with fentanyl (VA; n=26);) or in combination of VA with EA (n=17). Artificial lung ventilation was been performed under condition of normoventilation. Haemodynamics monitoring included control of mean arterial pressure (MAP), heart rate (HR), cardiac index (CI), stroke index (SI) and systemic vascular resistance (SVR). Results (essential): Application of dalargin during anaesthesia led: during TIVA to increasing of SI from 29(20,0-47,8) to 36(20,0 - 54,7) ml/m2, $p<0.05$) to decreasing in HR from 78(58-100) to 65(54-94) min-1 and MAP of 104(77-120) to 93(76-111)mm Hg; combination of TIVA with EA to increasing of SI from 37(24,2-50,9) to 42(23,4-54,0) ml/m2, $p<0,05$, decreasing HR of 78(63-105) to 73(55-94) min-1 ($p<0,05$), and MAP of 98(93-134) to 86(72-113) mm Hg ($p<0,05$), the tendency to decrease SVR; combination of VA with fentanyl decrease SVR from 2140(768-3640) to 1383(797-2357) dyne×s×cm-5, MAP from 102(66,7-121,3) to 79(67,3-89) mm Hg, the tendency to increasing SI and CI; combination of VA and EA to decreasing of SI from 52(47,5-60,0) to 29(27,1-31,6) ml/m2, $p<0,05$, CI from 4,8(3,6-6,1) to 2,2(2,0-2,4)l/min×m2, $p<0,05$), and increasing of SVR from 946(782-1145) to 1971(1216-2842), dyne×s×cm-5 ($p<0,05$).

Conclusion: Application of dalargin during anesthesia in patients with concomitant cardiovascular diseases: in TIVA increases SI and reduces HR and MAP; in combination with TIVA EA increases SI, reduces HR and MAP; with VA with fentanyl reduces the SVR and MAP; and for VA in combination with EA reduces SI and CI increases the SVR. VA in combination with EA and dalargin causes the depression of the system of blood circulation that limited the application of medication in this type of anesthesia.

Paper No: 897.00

Perioperative beta blockade at south african vascular surgery training facilities

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Introduction: Once lauded as one of the most valuable interventions across all fields of contemporary medicine, (1) perioperative beta blockade (PBB) is a practice that has come under intense scrutiny. Publication of the POISE study(2) forced a modification of recommendations for PBB in consensus guidelines(3,4) Current practice in South Africa has not been reported.

Objectives: The primary objective of the study was to describe current intended practice, with respect to PBB, in patients undergoing major vascular surgery at South African specialist training facilities. Describing participant satisfaction with current strategy; determining similarities and differences of opinion between Specialist Anaesthetist and Specialist Vascular Surgeon; and identifying potential barriers to the intervention, were secondary objectives.

Methods: One Specialist Anaesthetist and one Specialist Vascular Surgeon from each of the seven recognised training facilities for vascular surgery in South Africa were included in a partially selective observational survey. Data was generated by the use of a semi-structured questionnaire specifically developed to address the objectives of the study.

Results: The POISE study(2) results and updated international consensus guidelines(3,4) had not prompted a change in approach at most facilities. There was inconsistency in methods of risk stratification, treatment implementation, titration practices, and the timing of withdrawal of medication. The involvement of the Anaesthetists in the perioperative management of vascular surgery patients was less than reported in other countries.(5,6) The participants supported a major role for Anaesthetists in the future, and a move towards multidisciplinary involvement in policy development and patient management. Less than half of the participants were satisfied with current practice. Anaesthetist and Vascular Surgeon opinion on current intended practice correlated poorly. Opinions correlated least well at facilities where both clinicians claimed responsibility for PBB, implying that communication may be a problem. Similarities, where they did occur, were in keeping with recommendations that are widely supported in the literature. The need for appropriate monitoring was identified as one of many important barriers.

Conclusions: The study describes current intended practice at South African training facilities for vascular surgery. The variable practice across the country; suggested changes to clinician responsibilities; widespread dissatisfaction with current strategy; poor correlation of participant responses; and the identification of multiple barriers to the implementation of strategy, highlight the need for review at all facilities.

Further research is needed as the optimal strategy for reducing risk in patients undergoing vascular surgery remains elusive.

References

1 Shojania KG, Duncan BW, *et al.* Making health care safer: a critical analysis of patient safety practices. *Evid Rep. Technol. Assess.(Summ)* 2001;(43)(43):i-x, 1–668.

2 POISE Study Group, Devereaux PJ, Yang H, et al. Effects of extended-release metoprolol succinate in patients undergoing non-cardiac surgery (POISE trial): a randomised controlled trial. Lancet 2008 May 31; **371**(9627): 1839–1847.

3 American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, et al. 2009 ACCF/AHA focused update on perioperative beta blockade incorporated into the ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery. *J. Am. Coll. Cardiol.* 2009 Nov 24; **54**(22): e13–e118.
4 Poldermans D, Bax JJ, *et al.* Guidelines for pre-operative cardiac risk assessment and perioperative cardiac management in non-cardiac surgery: the Task Force for Preoperative Cardiac Risk Assessment and Perioperative Cardiac Management in Non-cardiac Surgery of the European Society of Cardiology and endorsed by the European Society of Anaesthesiology. Eur. Heart J. 2009 Nov; **30**(22): 2769–2812.
5 VanDenKerkhof EG, Milne B, Parlow JL. Knowledge and practice regarding prophylactic perioperative beta blockade in patients undergoing noncardiac surgery: a survey of Canadian anesthesiologists. *Anesth. Analg.* 2003 Jun; **96**(6): 1558–65.
6 Price DJ, Kluger MT, Fletcher T. The management of patients with ischaemic heart disease undergoing non-cardiac elective surgery: a survey of Australian and New Zealand clinical practice. *Anaesthesia* 2004 May; **59**(5): 428–434.

Paper No: 908.00

Takotsubo cardiomyopathy during extubation

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We report the case of a 45-year-old woman with a suspicion of CA ovary. The patient, who had no previous medical problems, underwent a diagnostic laparoscopic surgery under general anesthesia. After uneventful induction with thiopental, fentanyl and succinylcholine, anesthesia was maintained with sevoflurane and cisatracurium. At the end of surgery, atropine and neostigmine were used for reversal of neuromuscular blockade. A few seconds later, her electrocardiography (ECG) changed from sinus tachycardia (120 beats/min) to ventricular tachycardia with palpable pulse (160-190 beats/min), which was treated with lidocaine. After that the ECG showed sinus tachycardia (110-120 beats/min) and ST segment elevation in leads V4–V6. Urgent coronary angiography was performed and revealed no significant coronary obstruction. Echocardiogram showed dilatation of mid apical part with hypercontraction of basal part of left ventricle (apical balloon appearance of left ventricle), compatible with takotsubo cardiomyopathy. The cardiac enzymes were within normal range. The patient was treated in the cardiac care unit for 3 days and discharged without other complications. Takotsubo cardiomyopathy, also known as transient left ventricular apical ballooning syndrome, is similar to acute myocardial infarction. Diagnosis of takotsubo cardiomyopathy requires clinical characteristics, biomarker data, echocardiographic findings, and angiographic data1. Bybee and Prasad2 have proposed modified Mayo Clinic Criteria for the diagnosis of transient left ventricular apical ballooning syndrome. The criteria included the finding of transient left ventricle wall motion abnormalities involving the apical and/or midventricular segments with wall motion abnormalities extending beyond a single epicardial coronary distribution, the absence of obstructive epicardial coronary artery disease or angiographic evidence of acute plaque rupture that could be responsible for the observed wall motion abnormality, and troponin elevation or new electrocardiogram abnormalities such as transient ST segment elevation and/or diffuse T-wave inversions. Regarding the underlying mechanism of takotsubo cardiomyopathy, most believe its pathogenesis to be a stress-induced neurohormonal phenomenon, while a smaller group believes that the transient occlusion of an epicardial coronary artery is responsible3. Management of takotsubo cardiomyopathy is mainly supportive. For our patient, use of atropine with vagolytic effect may enhance sympathetic activity, leading to a transient cardiomyopathy. Therefore, to prevent this acute complication, atropine should be carefully used for reversal of muscle relaxant.

References

1 Liu S, Dhamee MS. Perioperative transient left ventricular apical ballooning syndrome: takotsubo cardiomyopathy: a review. *J Clin Anesth* 2010; **22**: 64–70.
2 Bybee KA, Prasad A. Stress-related cardiomyopathy syndromes. *Circulation* 2008; **118**: 397–409.
3 Lindsay J, Paixao A, Chao T, Pichard AD. Pathogenesis of the takotsubo syndrome: a unifying hypothesis. *Am J Cardiol* 2010; **106**: 1360–3.

Paper No: 912.00

Reexpansion pulmonary edema during anesthetic recovery

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Introduction: Acute Respiratory Distress Syndrome is an acute and severe alteration of pulmonary structure and function secondary to an acute inflammatory injury that causes diffuse bilateral pulmonary edema, due to an increase in pulmonary capillary permeability, without heart failure. It includes hypoxemia, decrease in pulmonary compliance and residual capacity and bilateral infiltrates, with Pa02/Fi02 lower than 200mmHg. It appears after a direct or indirect pulmonary injury and requires ventilatory assistance with positive pressure for its treatment.
Goals: Analyze the possible causes of acute respiratory distress in the immediate postoperative period.

Results: A 27 year old male is admitted with oppressive thoracic pain, fever, dyspnea, night sweats, cough and weight loss. CT scan: anterior, heterogeneous mediastinal mass, displacing vascular structures and multiple nodular images; pericardial and left pleural effusion with collapse of the lower lobe. FVC 2L (44%), FEV1 1.67 L (44%), FEV1/FVC 100%, with severe restrictive ventilatory failure. FNAB suggested T lymphoproliferative process. A mediastinotomy with biopsy plus chest drainage tube is performed with thoracic epidural anesthesia and TIVA. 4 L of left pleural effusion exudate are drained. After extubation, the patient shows dyspnea, desaturation and wheezing, global decrease of air entry and abundant secretions. After administration of salbutamol, hydrocortisone and adrenaline without any improvement we proceed to intubate and start MV. A CVC is placed in the right internal jugular vein. CVP: 8cmH20. Citrine liquid is aspirated through fiberoptic bronchoscopy and the presence of bronchopleural fistula is dismissed. X-ray: opacification of both pulmonary fields. Arterial blood sampling: PH 7,18, PCO2 50mmHg, PO2 152,2mmHg, HCO3 18,3meq/L, BE -10.1meq/L, SO2 98,7%, PaO2/FIO2: 152. The patient is admitted into ICU under MV recovering ad integrum after 8 days.

Discussion: The incidence of reexpansion pulmonary edema increases with the duration of prior collapse, an effusion volume greater than 2L and rapid expantion. Differential diagnoses include cardiogenic pulmonary edema and bronchopleural fistula. Due to normal CVP, absence of fistula, PaO2/FIO2 lower than 200mmHg and serous secretions in the airway, the most likely diagnosis is reexpansion acute distress. The main triggers proposed are the increase of pulmonary capillary permeability resulting from chronic collapse and mechanical stress over microvasculature, aggravated by the termination of positive pressure ventilation. The epidural anesthesia could have also contributed due to pulmonary sympathetic block.

Conclusion: The suspicion of this condition is essential, since it could be prevented by limiting the quantity of drained volume in longstanding effusions.

Keywords: Reexpansion Pulmonary Edema; Anesthesia; Pleural Effusion; Acute Respiratory Distress Syndrome

References

1 Gleeson T, Thiessen R, Müller N. Reexpansion pulmonary edema: computed tomography findings in 22 patients. *J Thorac Imaging*. 2011 Feb; **26**(1): 36–41.

2 Neustein SM. Reexpansion pulmonary edema. *J Cardiothorac Vasc Anesth*. 2007 Dec; **21**(6): 887–91. Epub 2007 Apr 16. Review.

3 Feller-Kopman D, Berkowitz D, Boiselle P, Ernst A. Large-volume thoracentesis and the risk of reexpansion pulmonary edema. *Ann Thorac Surg*. 2007 Nov; **84**(5): 1656–61.

4 Pietsch JB, Whitlock JA, Ford C, Kinney MC. Management of pleural effusions in children with malignant lymphoma. *J Pediatr Surg*. 1999 Apr; **34**(4): 635–8.

5 Critchley LA, Au HK, Yim AP. Reexpansion pulmonary edema occurring after thoracoscopic drainage of a pleural effusion. *J Clin Anesth*. 1996 Nov; **8**(7): 591–4.

Paper No: 922.00

Lower extremity motor deficit after right upper lung lobectomy and rib resection

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Introduction: The thoracic epidural anesthesia is a safe technique with few complications. It is useful for postoperative analgesia in thoracic surgery, given that thoracotomy is one of the most painful surgical approaches. We report on a patient who had suffered lower extremity weakness after surgery for lung lobectomy and resection of costal arches.

Clinical Case: A 66 y/o man, type II diabetes, diagnosed a lung tumor . It is operated under general anesthesia with selective intubation and epidural catheter inserted at the D6 level for postoperative analgesia. Surgery consisted of right upper lobectomy and resection of the 1 to 5 right costal arches due to neoplastic infiltration.

Postoperative evaluation disclosed a paresis of right lower extremity. Epidural analgesic infusion is stopped and spinal MRI is performed, that showed findings consistent with pre-spinal hematoma at the D5-D6 level._ Laminectomy disclosed an intradural-extradural mass of hemostatic material of Surgicel and associated hematoma inserted through the neural foramen and invading the ventral spinal canal .

Discussion and Conclusion: Even if spinal hematoma is a relatively rare complication due to epidural anesthesia, with an incidence of 1: 200,000; our case is interesting since the compression was due to hemostatic material and not to the spinal technique itself. Hemostasis after resection of the costal arches may provoke spinal cord compression and be misguided for the insertion of a dorsal spinal catheter. Early diagnosis and treatment is essential for this serious complication.

Paper No: 925.00

Anesthetic implications of dengue

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Introduction: Dengue is, on a worldwide scale, a common disease with impact on anesthesiological patient management. It became the most common (and still most rapidly spreading) arthropod borne (arbo) virus disease with a marked increase in cases to now ~100 million patients annually (WHO). Increasing international travel activities will confront anesthetists worldwide with patient returning from dengue endemic countries. The disease has an incubation time of up to 14 days, so the disease may develop after return from endemic regions. Thus, key features of the

disease relevant for anesthesia should be known to anesthesiologists also in dengue-free countries. However, surprisingly limited information have been published on anesthesiological aspects of dengue so far [1,2]. Working in a dengue endemic region (Dutch Caribbean, Bonaire), the authors want to share their expertise on this patient category, and put it in perspective of the few papers published so far on this subject. Anesthesiological impact: The anesthesiological impact of the disease is related to severity and phase of the disease. In an early phase, the disease usually presents as influenza-like infection with high fever (-40'C). In up to circa 5% of cases the disease will develop as Dengue Hemorrhage Fever (DHF), including the Dengue Shock Syndrome (DSS). Herein, hemodynamics are compromised by vessel- and serosa-leak induced hypovolemia, cardiodepression, altered vascular resistance and (relative) bradycardia, requiring the combination of volume expansion and cardiovascular drugs. Hemorrhage in DHF/DSS is caused by thrombocytopenia (tracked by repetitive platelet counts), combined with vasculopathy, liver dysfunction and DIC. Respiratory complications result from the disease itself, but also from the significant fluid volumes required for hemodynamic stabilization; therapy herein ranges from simple O2-masks to mechanical ventilation in dengue-related ARDS. If a patients reports influenza–like symptoms and recent travel activities to countries with dengue prevalence, then a high grade of suspicion is warranted. Anamnesis should then also focus on coagulation disorders, e.g., epistaxis, gum bleeding, or gastrointestinal bleeding. Laboratory tests should include platelet count, but also plasmatic coagulation and hepatic parameters. In case of low or decreasing platelet count, the indication for a neuraxial anesthesia should be critically balanced against the increased risk of epidural hematoma. When the disease progresses to DHF and DSS, therapy includes ventilatory, hemostatic and hemodynamic support, with focus on restoration of intravascular volume.

References

1 Indian Heart J 2009
2 Int J Obstet Anesth 2006

Paper No: 931.00

Anesthesia in patients with von recklinghausen disease

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Introduction: Von Recklinghausen Disease (VRD) or Neurofibromatosis type 1 is a progressive genetic disease characterized by¨café-au-lai spots and a tendency to develop ecto- mesodermic tumours, which is aggravated by pregnancy. Total prevalence: 1/3000 individuals; and 2500/18500 pregnancies. Anesthesic problems: in airways due to macroglotia or pharynx/ larinx lesions; respiratory complications due to lung fibrosis, cystic lung disease, scoliosis; hypertensión caused by renal artery stenosis, carcinoid tumours, or associated pheochromocytoma; difficulty in neuroaxial blocking produced by hydrocephalia, spina bífida, scoliosis and medulla tumours; prolonged neuromuscular blocking even if it is controversial.1;2

Objective: to report the anesthesic strategy utilized in two patients.

Case 1: Female, aged 37 yr, 56kg, ASA II, Malampati IV, 40wk fourth gestation. Normal laboratory tests and ECG. Clinical history: jaw neurinome ablation and pleomorphic parotid adenoma limiting mouth aperture and facial paralysis sequelae. Normal neurologic evaluation. Procedure: delivery peridural analgesia: 0.25% bupivacaine 12ml, fentanyl 50ug. At 60min urgent Cesarean. Peridural reinjection: 2% lidocaine plus epinefrine 15ml. Satisfactory blocking. Hemodynamically stable. Surgery duration: 90min. Derived to common room (Aldrete9/10). Released at 24h.

Case 2: Female, aged 27 yr, 55kg, ASA II, Mallampati I. Surgery: videolaparoscopic cholicystechtomy. Normal laboratory tests, electrocardiogram, electroencephalogram, neumonological and neurological evaluation. Premedication: midazolam 2mg. Anesthesia: TIVA. Induction: midazolam 5.5mg, fentanyl 125ug, atracurium 30mg. Maintenance: midazolam 2.5mg/30min, remifentanyl 0.25-0.50ug/kg/min, atracurium 5mg/30min. Direct orotracheal intubation, unique maneuver. Intraoperatory procedures: mechanical controlled ventilation, hemodynamically stable. Surgery duration: 75min. Neuromuscular blocking control: TDF4/4,T4/T1=80%. Neuromuscular blocking pharmacological reversal. Extubation without complications. Derived to common room (Aldrete 10/10). Released at 24h.

Discussion: The anesthetic technique to use in VRD is very controversial. In Case 1 due to higher risk of manipulation of airways the selected option was regional anesthesia. CNS imaging evaluation previous to regional anesthesia could provide security given the presence of asymptomatic medulla tumours in 40% of VRD patients, since their growth is exacerbated by pregnancy.1 In Case 2 considering the surgery procedure general anesthesia with atracurium was preferred as muscular relaxant due to short half life.1;2 In both situations anesthesia planning was performed analyzing the risk-benefit. Given the anesthesia implications in VRD, an adequate surgery planning could avoid complications improving the results.

Keywords: Von Recklinghausen; Neurofibromatosis; pregnancy; anesthesia

References

1 Bhagyalakshmi R, Koshy R. Femoral sciatic block: A safe alternative in von Recklinghausen's disease. *Indian J Anaesth*. 2011; **55(2)**: 210–2.
2 Hirsch N, Murphy A, Radcliffe J. Neurofibromatosis: clinical presentations and anaesthetic implications. *Br J Anaesth*. 2001; **86**(4): 555–64.

Paper No: 943.00

The Baska® Mask – A New Extraglottic Airway Device with Two Gastric Drains – A Feasibility Study

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Introduction: The Baska Mask® (ProAct-Medical Systems, UK) is a new extraglottic airway device (EAD) which brings together features of LMA-ProSeal®; LMA-Supreme®; i-Gel® and Slipa® (bite block, oval-shaped airway tube, gastric drain); and safety improvements: 1) A self-sealing membranous, variable pressure, non-inflatable cuff that, during IPPV, increases the seal with increasing airway pressure; 2) A gastric reflux drainage system consisting of a large distal aperture located at the upper end of the oesophagus, which opens into a sump cavity at the back of the mask; and two tubes running the length of the main stem of the device, one on each side of the main airway tube, both of which open into the sump cavity. One of them is connected to high pressure, high flow suction whilst the other is left open to atmosphere to equilibrate the pressure in the sump cavity to atmospheric. This system allows for rapid drainage of gastric fluids or secretions that may collect during use, provided suction is performed during maintenance and emergence from anaesthesia; 3) A suction elbow, i.e. an extra connector for attaching suction to the proximal end of the tube to keep the sump area clear; and 4) A tab for manually curving the mask to ease insertion.
Objectives: To determine whether the improvements incorporated in the Baska Mask® provide a clinically useful EAD that helps to improve the safety and efficacy of airway management in patients undergoing surgery.
Methods: Fifty ASA I-III patients, undergoing a variety of surgical interventions not requiring tracheal intubation, were involved to receive a Baska mask® during anaesthesia. Exclusion criteria were: known/predicted difficult airway, mouth opening <2.5 cm, at risk of aspiration, surgery in the non-supine position, or were undergoing head and neck surgery.
Results: The first attempt success rate was high (88%) and considered to be very easy in 92%, while removal was considered easy in all cases. The oropharyngeal leak pressure was above 30 cm H20 in all patients, achieving the maximum of 40 cm H20 in 82% of the patients. In two patients, no adequate capnogram was obtained, and a smaller size of the mask was inserted, revealing adequate results. Fibreoptic evaluation of the anatomical position of the masks showed the vocal cords, although in six patients (12%) only the epiglottis could be visualized.
Conclusions: We conclude that the Baska Mask® shows promising safety features in airway management.

Paper No: 944.00

Is possible to evaluate de quality patient perception in anestesiologhy care? patients value in a pre-anesthesia consultation

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Introduction: An indicator of health service quality is the degree of patient satisfaction with care. The patient satisfaction with the anesthesiologist is difficult to measure in the OR for obvious reasons. However, preoperative consultations could be a perfect situation for quality of care evaluation and patient perception.
Objective: To analyze which variables most influence the degree of satisfaction of our patients after preoperative consultation.
Material and Methods: We conducted an anonymous survey in randomized patients scheduled for pre-anesthesia evaluation. The survey included 4 questions on a categorical scale, (no satisfied, somewhat satisfied, regular satisfied, satisfied and very satisfied): Timeliness of care, Compression of information received, Respect and Degree of Satisfaction, and about the knowledge of anesthesiologist name who evaluated them. Surveys were conducted from January 2007 /December 2008. The statistical analysis was a binary logistic regression model, which selected the best set of predictors of satisfaction ($p<0.05$).
Results: 1263 surveys were conducted. 98.7% of respondents considered their degree of satisfaction satisfied /very satisfied. The 96.95 felt sufficiently informed /well enough. 83.3% felt that punctuality in the schedule was good or very good but only 71.8% knew the name of the anesthesiologist who attended them. Regression analysis found: the highest degree of satisfaction were related to information received (OD 12.788, $p<0.0001$), perception of received evaluation (OD 10.41, $p<0.003$) and punctuality (OD 7.18, $p<0.0001$). Patients were not able to remember the name of anesthesiologist in more that 25% of surveys (this item did not influence the analysis).
Conclusion: The evaluation of patient perception of anesthesiology care is possible in the pre-anesthesic consultation procedure. The degree of satisfaction is linked more to the anesthesiologist's ability to communicate that to other variables, and induces them to strengthening in the attitudes of empathy and training in the clinical interview.

Paper No: 946.00

Ultrasound guided peripherally inserted central catheters(picc) under local anaeasthesia saves bed days

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Introduction: Peripherally Inserted Central Catheters (PICC) lines are becoming more popular because it is easy to insert under local anaesthesia and use of ultrasound(US) increases its success rate to near 100%.
Objectives: To study success rate under US guidance and number of hospital bed days saved Methods We reviewed our PICC data base since the records began in 2007. Ours is a District General Hospital (DGH) in the UK admitting unselected patients of both medical and surgical specialities. We present the data regarding lines done over two year period from 2009–2010.
Results: We did 118 (101 single and 17 dual lumen) PICC lines over the two year period (42 in 2009 and 76 in 2010). All were done under ultrasound guidance and local anaesthesia. Majority of the patients were elderly. Indications for insertion were antibiotics 71%, total parenteral nutrition (TPN) 19% chemotherapy in 9% and difficult IV access 1%. There were no failures. Complications were minimal (Table). Average time from referral to insertion was 22 hours. Average length of stay was 32 days (range 1 to 116 days). This service has saved 1077 bed days for the hospital in view of discharge of these patients in to the community for ongoing care. PICC insertion also minimised missed treatments and improved patient satisfaction. Table 1. Complications following PIIC insertion Total no of PICC inserted 118 Line blockage(9/42 in 2009 and 7/76 in 2010) 16 (13.5%) Successfully unblocked with urokinase 12 Line infection 5(4.2%) Local bruising 2(1.6%) Thrombosis 1.
Conclusions: PICC is predominantly for administration of long term antibiotics, TPN, blood sampling and chemotherapy1. Because it is usually done in the arm it is more comfortable for the patient (compared to a central line in the neck) and risk of infection is much less compared to a central line. Most of the patients in our audit were elderly and many of them had multiple co morbidities. Once they have had the line inserted they could be discharged in to community hospital/residential homes or their own homes where the district nurses provided ongoing care. Training the vascular access nurse improved the access to the service and also enhanced after care, follow-up leading to reduced complications such as line blockage.

Reference

1 Bishop L, Dougherty L, Bodenham A, *et al.* Guidelines on the insertion and management of central venous access devices in adults, *International journal of Laboratory Hematology* 2007; **29**: 261–78.

Paper No: 950.00

Prognosis factors of mortality after surgery in a first-level public health service hospital. ìts possible to improve it?

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Objective: To analyze prognostic factors for survival of patients operated on a first-level public health hospital and propose changes in the patients circuits that improve this results Method: The official database of patients operated from January 1 until 31 December 2007 was reviewed. Data extracted included patient age, ASA grade classification, surgical service of reference, type of admission and surgery (scheduled/emergency), and date of discharge. The study excluded ophthalmic surgery without income. The statistical analysis was performed using a Cox multivariate model, in order to identify independent variables predictive of survival at discharge.
Results: 4184 patients were included in the analysis. The average age of the study population was 53.46 (39-56), 56.7% were women. Income was conducted as scheduled in 58.3 % of patients and also 75.1% of them were operated upon by a scheduled procedure. For patients who received urgent assistance over 80% were assigned to general surgery service. For ASA classification: 22.3% ASA I, 45% ASA II, 27.8% ASA III, 5,% ASA IV: The number of exitus was 97 (2.31%) (35,05% of them were ASA III and 41,23% ASA IV). General surgery and traumatology agglutinated more than 50% ASA III/IV patients. For this group the median age was 74 (25th percentile 65.5 and 75th percentile 78.5). Univariate Cox regression found that age$>$ 65 years ($p < 0.0001$), emergency admission and emergency interventions ($p < 0.0001$), ASA IV and provenance service (general surgery) were related to the mortality. These results were confirmed in multivariate regression.
Conclusions: Improving the physical condition of patients when ìts possible, mainly those aged over 65, or strive for change a urgent procedure by an scheduled intervention may optimize the outcomes in terms of postoperative mortality after surgery. The role of anesthesiology service in this process could be transcendent.

Paper No: 959.00

Are anaesthetists doctors? - a UK survey

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Introduction: Who anaesthetists are and the role they play in a hospital, has long been misunderstood by the general public and patients. The Royal College of Anaesthetists (RCoA) commissioned a survey to ascertain whether the general public of United Kingdom understood that anaesthetists were medically trained doctors who had undergone specialist training1. The results showed that 35% of the public did not consider anaesthetists to be medically qualified doctors. The RCoA decided that greater awareness of anaesthetics was required among the population. Leaflets and posters were produced and a National Anaesthesia Day was organised to inform the public of who anaesthetists are and what they do on 25th May 20002.
Objectives: The aim of this new survey was to look for any change in the public perception of anaesthetists after 11 years.
Methods: A total of 38 post-operative patients at the Royal London Hospital were surveyed on their knowledge of anaesthetists. They were asked what their professions was, if they had an operation that day, if they meet the anaesthetist before the operation, whether the anaesthetist discussed their anaesthetic options and if their queries had been adequately answered. At the end they were asked in their opinions what type of training anaesthetists had received.
Results: The results showed that 60% felt that anaesthetists had first trained as doctors and then had specialist training. 21% thought that anaesthetists trained as apprentices, 11% thought they had studied for a National Vocational Qualification (NVQ) and 8% suggested other forms of training, including studying anaesthetics at university. Comparing different social class groups A and B versus D and E showed a large difference in the correct understanding of training of 82% vs. 40%. Those from social class E were correct only 20% of the time where as in class A it was 83%.
Conclusions: This survey shows that public perception of anaesthetics has not changed and more work is required in engaging with the public and raising the profile of anaesthetics in the public domain. Those of social classes A and B appeared to be well informed but those from D and especially E were less knowledgeable. Large amounts of money are often required to change public perception and are often ineffective. As anaesthetist we should accept the fact that general public's perception regarding our qualification or training is difficult to change but take pride in our work and contribution to overall patient care.

References

1 Dr J M Davies. Do the Public think we are Doctors? Results of a MORI Survey. Royal College of Anaesthetists Newsletter March 2000; 51: 319.
2 John Goldstone. National Anaesthesia Day 25 May 2000. Royal College of Anaesthetists Newsletter March 2000; 51: 322.

Paper No: 960.00

An essay about the anesthesiology workforce needed in Sub-Saharan Africa (SSAF)

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Introduction: Most countries don't realize the importance of anesthesia for health development plans. More than 60% of any hospital activities depend on anesthesia, even in developing countries. Developing other specialties without credible plans for anesthesia will not work.
Materials and Methods: A 1998 Belgian predictive model served as basis for this exercise [1-2]. The Cotonou anesthesiologists' training program provided 15 years comprehensive SSAf data[3]. Only anesthesiologists are considered, assuming nurse anesthesists(NAs) cover further needs. The need for specialists equals demand minus offer. Results: Demand cannot be deduced from models prevailing in developed countries. A priority could be to have one anesthesiologist per 1/100.000 urban population in cities>100.000. The remaining services being provided by NAs, at a 5 to 10 NA/anesthesiologist ratio. African population is expected to grow 59% until 2035: 2.22 to 1.55% per year[3], increasing demand proportionately. Should government allow for further health expenditures, this should be added. Offer=(specialists+trainees). Their numbers must be corrected for several factors for which we propose the following observed values: -Careers are short; candidates enlist late after medical school and graduate in 5.3 years (instead of 4 as planned). Retirement age is 60. -After 55 performance decreases by 15%[1]. -Only 7/51(15%) anesthesiology graduates were women, this proportion should reach 50% by 2035 (+1,5%/yr); equal time is devoted to profession by Belgian female or male trainees, but it is 20% less for female specialists (pregnancies, child care). -In SSAf 0.13% of trainees and 0.22 % of specialists died or became incapacitated, per year. -Observed brain-drain is 2/58 during training (3.44%) plus 8/51(15.6%) at graduation. -3/58(5.2%) trainees abandoned anesthesia. -Working capacity of a trainee =75% of a specialist's[1]. -Foreign trainees are counted as workforce during local rotations. -Trainees on rotation abroad are deducted. Added, those factors require to enlist every year more than

5 candidates for every 100 active anesthesiologists just to avoid reducing anesthesia services below today's.
Discussion: Most proposed corrective factors are based on actual data from the Cotonou program; it covers 11 SSAf countries and is therefore representative. Belgian estimates were used where no African data exist; they have proven accurate for Belgium since 1998; whether they will fit to SSAf is unknown.
Conclusion: Ignoring corrective factors would severely underestimate needed enrolment for anesthesiology in SSAf, and jeopardize future public health, despite the presence of NSAs.

References

1 Acta Anaesthesiol Belg. 1998; **49(3)**:205-220.
2 Acta Anaesthesiol Belg. 1998; **49(3)**:185-191.
3 Revue Africaine d'Anesthésiologie et de Médecine d'Urgence 2009; **14(2)** : 25-31
4 UN: The 2008 Revision Population Database

Paper No: 962.00

Design and proposal for a balanced scorecard in the follow up of the performance management in hospital anaesthesia services. case: anaesthesia, analgesia and reanimation service of the hospital escuela eva perón. granadero baigorria, Santa fe, Argentina

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Introduction: The Balance Scorecard (BSC) is a management tool taking origin in the enterprise environment, widely used in the public and health sector in several countries. It permits to manage, planning, organizing, directing, evaluating and strategically controlling an organization; and also transferring the vision and strategy to a coherent set of indicators within a shared aim. The evolution of Hospital Anaesthesia Services (HAS) forces them to innovate in their management strategy.
Objective: To develop a BSC model for HAS as a management and control system, to be applied particularly to the Anaesthesia, Analgesia and Reanimation Service of the Hospital Escuela Eva Perón (AARS-HEEP).
Material and methods: Descriptive, qualitative study. Primary and secondary sources; literature review. Procedures: Questionnaires, interviews, documental qualitative/quantitative data, classification, summary and descriptive statistical analysis.
Results: tables and/or graphs. Case: strategic analysis, design and proposal of BSC model.
Results: A BSC potential model, starting with the AARS-HEEP strategically analysis, transferring this vision of the service into operative terms, namely, "success key factors" or variables interconnected permitting the strategically vectors establishment (cause/effect relation) was developed. Afterwards, from five proposed perspectives i.e., interest and financial groups, internal processes, growth, learning and research applying previously constructed indicators, an actual management control system, was evaluated.
Discussion and conclusions: The BSC is a valuable and liable tool, functioning as a real management control system that permits the performance-quality evaluation (evaluation as an ally). Indicators are used to anticipate deviation from proposed objectives. The BSC allows error and adjustment, driven to innovation, and enhancing taking decisions at different levels and suppression of short-term goals in bureaucratic management. Could it be possible to implant it in the HAS? The HAS function as institutions presently imbedded in burocratic models (vertical and hierarchical), strongly organized and resistant to changes. These models are against heterarchia (shared mission and vision) truly leadership. To this must be added the economical difficulties. The BSC could enable communication in every field, focusing the management and rectifying the whole organization by means of shared strategic objectives. It could deliver control and evaluation mechanisms, mainly a positive evaluation leading to the investment into the budget planning process. The implementation would not be a simple task but a challenge to carry on future innovation.

Keywords: Balance Scorecard; management; indicators; anaesthesiology

Reference

1 KAPLAN R, NORTON D. The Balanced Scorecard Measures that drive performance. Harvard Business Review. 1992. [citado 2010 Sep 20]; 92105: 70-9. Disponible en: http://www.stevens-tech.edu/MSISCourses/450/Articles/ValueOfIT/TheBalancedScoreCard.pdf.

Paper No: 968.00

Submental tracheal intubation. case report

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Introduction: In the airway management of patients with multiple face fractures, the presence of the tracheal tube in the oral cavity can interfere with the surgical procedure. It is therefore necessary for an alternative path to be used. When the patient doesn't require a long period of ventilation, one alternative is a submental tracheal intubation.
Objective: The goal of this case report is to present a case of submental tracheal intubation for reconstructive surgery of the maxillary and mandibular fractures. Case report: A 24 year old male patient, 70 kg, ASA I, scheduled for reconstructive surgery of the maxillary and mandibular fractures. Obtained peripheral venous access 16G. Monitored by pulse

oximetry, cardioscope and noninvasive blood pressure. After preoxygenation, anaesthesia was induced by using propofol, fentanyl and cisatracurium. Intubated with a wired tube of 8.0mm. Correct placement was confirmed by the capnography. Anaesthesia was maintained by oxygen, protoxide and isoflurane. A submental incision was made on the left side of the patient. Soft tissues were divulsed until the floor of the mouth was reached. The distal part of the tube without the connector was clamped and exteriorized through the submental access. The tube was reconnected to the breathing system and the surgery continued without any complications. At the end of the procedure the patient was extubated and the submental incision sutured.

Discussion: The submental access is a simple procedure and a technique which presents excellent results. Complications are rare as the area does not have any big vessels or nerves. This provides a clear surgical field and the ability to treat all the injuries in one surgery. With this technique it is possible to perform an intermaxillary fixation without the need of a tracheostomy.

References

1 Nogueira CS, Sudano GLLA, Tanaka VY, *et al.* Intubação submentoniana em cirurgia bucomaxilofacial – Relato de caso. tRev Bras Anestesiol 1996; **46**:90.

2 Amin M, Dill-Russell P, Manisali M, *et al.* Facial fractures and submental tracheal intubation. *Anaesthesia*, 2002; **57**: 1195–1199

3 Chandu A, Smith ACH, Gebert R Submental Intubation: an alternative to short-term tracheostomy. *Anaesth Intensive Care*, 2000; **28**: 193–195.

Paper No: 983.00

Pre-operative antibiotic therapy Inappropriate variability of medical practice/experience. Usage vs. Clinical practice guides

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Introduction: One of the most frequent complications in the postoperative period is surgical wound infection. They are associated with an increase in morbidity and mortality, treatment failure, appearance of new antimicrobial resistance and increase interventions cost.

Objetives: We propose to assess the use of antimicrobial prophylaxis in surgical practice as proposed in guidelines by the Argentine Society of Infectology,and to observe the practice in public hospitals of Buenos Aires city at the time of prescribing preoperative antibiotic medication. Our secondary goal is to compare practice between staff anesthesiologists (P) and resident physicians (R).

Methods and Materials: We describe a multicenter, descriptive cross sectional study. Each participant received a questionnaire to answer (randomized sampling by conglomerate: high and low hospital complexity). The inclusion criteria involved the questionnaire to be completed fully. The Chi-square test was applied for proportion comparison, considering significance at $p<0,05$.

Results: From a total of 50 surveys, 29 were answered by resident physicians and 21 by anesthesiologist. 50% of the surveyed physicians do not use the guide, although having 78% of the drugs readily available. The time frame of administration of antibiotic prophylaxis varied between 60 to 0 minutes prior to knife to skin. This resulted in only 32% of antimicrobial prophylaxis being administered on time. The distribution of the answers was not normal: the mode was 2 and the median 3, 17 observations in the first quartile (0-2 correct answers), 20 observations in the second quartile (3-5 correct answers), 12 observations in the third (6-8 correct answers) and 1 observation in the forth (9 correct answers). 18% answered correctly more than 70% of the survey. 43% of the R subgroup did it in time due versus 14% of the P subgroup ($p=0.028$).

Discussion: While many of the physicians have the correct antimicrobials in their municipal hospitals available, just half of them use the guidelines at the time of choosing the correct antibiotic. 68% of the times, the drug is not administered in time. Likely responsible for this are the lack of access to the patient in time and not having enough clinical staff.

Conclusions: Only a small proportion chose the antimicrobial correctly. It is clear the need to administer correctly and apply correctly guidelines for the use of pre-surgical antibiotic prophylaxis. It would be helpful to place printed guidelines or proformas in anesthetic evaluation forms, clinical notes, induction rooms and operating

References

1 Sociedad Argentina de Infectología. Guía para la Profilaxis Antibiótica Prequirúrgica 2009 Dietrich E S, Bieser U, Frank U, Schwarzer G, Daschner F D. Chemotherapy Ceftriaxone versus other cephalosporins for perioperative antibiotic prophylaxis: a meta-analysis of 43 randomized controlled trials. 2002; 48(1): 49-56.

2 Anna R. Gagliardi, PhD*. Darlene Fenech, MD†. Cagla Eskicioglu, MD‡. Avery B. Nathens, MD§. Robin McLeod, MD‡. Factors influencing antibiotic prophylaxis for surgical site infection prevention in general surgery: a review of the literature, 2008

Paper No: 997.00

Preventive analgesia with lidocaine in intravenous infusion vs sulfate of magnesium for postoperative pain management

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Introduction: Pain is a protection mechanism, appears in any tissue injury, and has a double component: a specific feeling and one psychological as reaction to this feeling.
Objectives: To compare the intensity of postoperative pain following simple lidocaine or magnesium sulfate infusion in patients undergoing abdominal surgery.
Methods: With a controlled clinical trial design we studied 60 patients in elective way to abdominal surgery under general anesthesia, divided randomly into two groups of 30 subjects each: Group I received MgSO4 at doses of 30 mg/kg and group 2 lidocaine at doses of 1.5 mg/kg. Postoperatively re-inspected and the presence of pain with the visual analog scale (EVA) at the following times: basal/1/6/8/12/24 hours; sedation with the scale of Ramsay, hemodynamic variables.
Results: The groups were similar in age, weight, height, gender and physical condition. There was no clinical difference in hemodynamic variables. It was the quality of sleep, evaluated by EVA, expressed in medium and quartiles (25-75) in grupo1/2=10 (9-10) and 9 (9-10). The percentage of subjects without pain in grupos1-2 Ba/1/6/8/12/24 hours was: /47-63/57-73/80-73/90-77/93-80/97-87. Pain Leve=/ 50-27/43-20/20-24/10-23/7-20/3-13. Moderate pain=3-3/ 0-7/0-3. Severe pain=0-3 in the basement stage. Nausea and dizziness were presented only in 3% of the group treated with MgSO4
Conclusions: Postoperative pain intensity was lower in the group treated with simple lidocaine infusion.

References

1 Woolf CJ, Chong M. Preemptive analgesia-treating postoperative pain by preventing the establishment of central sensitibilization. *Anesth Analg* 1993; **77**: 352–79
2 Moiniche S, Kehlet H, Dahl JB. A qualitative and qualitative systemic review of preemptive analgesia for postoperative pain relief. *Anesthesiology* 2002; **96**: 725–41
3 Kissin I. Preemptive analgesia. *Anesthesiology* 2000; **93**: 1138–43.
4 Ko SH, Lim HR, Kin DC, Magnesium sulfate does not reduce postoperative analgesic requirements. *Anesthesiology* 2001; **95**: 640–6.
5 Paech MJ, Magann EF, Doherty DA. Does magnesium sulfate reduce the short and long term requirements for pain relief after caesarean delivery? A double blind placebo controlled trial. *Am J Obstet Gynecol.* 2006; **194**(6): 1596–602.

Paper No: 1004.0

Intraoperative practice in heart surgery: results of a countrywide survey in chile

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Introduction: Intraoperative practice in cardiac operations has evolved considerably over the last decade with the introduction of new technologies designed to assess cardiac, haemostatic and neurologic status.
Objective: Our objective was to describe the practice of national cardiac centers, to find out the intraoperative management in cardiac operations in Chile.
Methods: We conducted a survey in all institutions that perform cardiac surgery. A questionnaire was sent by e-mail between July 1 and August 31, 2011 focused on demographic data, cardiac output monitoring, transesophageal echocardiography (TEE) practice, depth of anesthesia and cerebral oxygenation monitoring and coagulation management, as performed during the previous 12 months. Responses were processed anonymously. Fisher's exact test was used for categorical variables analysis.
Results: Eighteen of 21 institutions (90,4%) responded: Six public hospitals, two universities, six private and four institutional armed forces, collecting a total of 4383 surgeries, which 30% were pediatrics. The 55.6% of surgeries were in public institutions, and seven of 18 centers performed more than 250 operations per year. The use of Pulmonary artery catheterization varied widely among hospitals (rank 0 – 100%). TEE practice also varied significantly according the center, used in 13 % of patients at public hospitals, while 70% of patients in non-public ones (p=0,001 by Fisher). Cardiac output monitors different from the other ones were used in only one place. New vasoactive drugs availability, such as terlipressin and levosimendan, varied significantly between public and non-public institutions (p=0,01 by Fisher). Only one center assesses the depth of anesthesia and cerebral oxygenation. Nine of 18 centers have transfusion protocols, based on standard coagulation tests (prothrombin time, platelets count, activated partial thromboplastin and activated clotting time). Two hospitals gave transfusions in more than 75% of the patients and only two institutions have thromboelastography and coagulation factors activity for additional monitoring. New hemosthatic technologies, as platelet function analyzer, were not available. Acetylsalicylic acid was suspended before surgery at eight of the 18 hospitals, whereas clopidrogel in all of them. Heparin resistance was treated mainly by additional heparin dose and by fresh frozen plasma transfusions, whereas exogenous antithrombin was used in only two centers.

Conclutions: Intraoperative practices vary substantially among the hospitals surveyed, and new technology is not widely available, becoming big challenges to improve the care of cardiac patients in Chile.

Paper No: 1005.0

The effect of intramucosal infiltration of different concentrations of adrenaline on hemodynamics during tran-sphenoidal surgery

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Introduction: Various approaches have been advocated to attenuate severe cardiovascular responses following intramucosal infiltration of adrenaline-lignocaine solution during trans-sphenoidal microsurgical excision of pituitary gland. One of the approaches is to reduce the concentration of adrenaline for mucosal infiltration.
Objective: We conducted this study to compare the effect of intramucosal infiltration of two different concentrations of adrenaline i.e. 1:2,00,000 and 1:4,00,000 in 2% lignocaine on haemodynamics as well as on bleeding following surgical incision.
Materials and methods: Fifty two ASA I-II patients, aged 15-70 years, undergoing elective trans-sphenoidal surgery for sellar masses were included in the study. A standard anaesthesia protocol was followed in all patients. The patients were randomized to Group A (n=27) receiving 2% lignocaine with 1:2,00,000 adrenaline and Group B (n=25) receiving 2% lignocaine with 1:4,00,000 adrenaline for intramucosal infiltration. The following parameters were recorded at baseline and at 1 minute interval after infiltration till 10 minutes: electrocardiogram, non invasive blood pressure, invasive blood pressure, SpO2, EtCO2, BIS value and train of four counts. Bleeding at incision site was evaluated as "minimal", "mild", "moderate" or "severe" by the neurosurgeon. If there was rise in systolic blood pressure by>50% of the baseline value, 10 mg of propofol was administered as the rescue drug. Primary outcome was number of patients requiring rescue treatment.
Results: 4 patients were excluded from the study. Hence, a total of 48 patients (24 patients in each group) were analyzed. The demographic and baseline data of two groups were comparable. Significantly lesser patients [12.5% (3/24)] in Group B had rise of>50% systolic blood pressure after nasal mucosa infiltration from baseline values as compared to [37.5% (9/24)].

References

1 Nemergut EC, Dumont AS, Barry UT, Laws ER. Perioperative management of patients undergoing transsphenoidal pituitary surgery. *Anesth Analg* 2005; **101**: 1170–1181.
2 Chadha R, Padmanabhan V, Rout A, Waikar HD, Mohandas K. Prevention of hypertension during trans-sphenoidal surgery–the effect of bilateral maxillary nerve block with local anaesthetics. *Acta Anaesthesiol Scand* 1997; **41**: 35–40.
3 Abou-Madi MN, Trop D, Barnes J. Aetiology and control of cardiovascular reactions during trans-sphenoidal resection of pituitary microadenomas. *Can Anaesth Soc J* 1980; **27**: 491–495.
4 Lee TJ, Huang CC, Chang PH, Chang CJ, Chen YW. Hemostasis during functional endoscopic sinus surgery: the effect of local infiltration with adrenaline. *Otolaryngol Head Neck Surg* 2009; **140**: 209–214.
5 Li X, Li T, Han D, Song X, Zhang L. Does topical application of adrenaline on nasal mucosa induce significant haemodynamic changes under general anaesthesia? *Eur J Anaesthesiol* 2009; **26**: 613–615.
6 Yang JJ, Shen JC, Xu JG. Cardiac asystole after nasal infiltration of lidocaine with epinephrine in a transsphenoidal hypophysectomy patient with hypertrophic cardiomyopathy. *J Neurosurg Anesthesiol* 2010; **22**: 81–82.
7 Yang JJ, Yu HM, Peng YG. Epinephrine infiltration of scalp or nasal mucosa induces what kind of changes in blood pressure under general anesthesia: hypertension or hypotension? *J Neurosurg Anesthesiol* 2010; **22**: 79–80.

Paper No: 1009.0

Anesthesia practice in north Afghanistan

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Introduction: Islamic Republic of Afghanistan is a land locked country in South East Asia bounded by Turkmenistan, Uzbekistan, Tajikistan, China, India, Pakistan & Iran. After more than two decades of War, conflicts & political instability (1978-2001) the situation in relation to Anesthesia practice & training is extremely critical in Afghanistan. [1] Indian Medical Mission (IMM) is a humanitarian Aid project of Government of India created for enhancing & strengthening health care facility in Afghanistan. After the US invasion of Afghanistan the IMM from Farkhor Shifted to Mazar-E-Sharif of Balkh Province of north Afghanistan [2].
Objecives: Indian Medical Mission Mazar-E-Sharif (IMM-M) is located in Balkh provincial hospital of MAZAR-E-SHARIF, fourth largest city of North Afghanistan. The aim of this presentation is to determine the impact of IMM (M) in improving safe Anesthesia Practice as per WHO guide lines in north Afghanistan. Afghanistan (population of 32 Million) there are only 9 physician Anesthetist [3]. Till now IMM (M) has completed More than 20,000 Anesthesia procedures & trained more than 50 Anesthesia technicians at Balkh Provincial hospital. In 2006 Anesthesia training programme was Started by WHO with IMM at Faryab & Mazar for the first time officially as per WHO IMEESC guidelines .[4]

Methods: Data collected from all Anesthesia provided by IMM(M) along with Anesthesia technicians of North Afghanistan from 2001 to present situation till date2011, retrospectively & Prospectively. They are tabulated as per Name, Age, sex, Diagnosis, Type of Surgery, Elective or emergency, PA check up done or not, and Type of anesthesia provided.
Results: (Essential) Over a period of 10 years more than 20,000 anesthesias' was provided by IMM (M) Team. Regional Anesthesia like SA, EA. CSEA Brachial plexus blocks were not popular among Anesthesia technicians largely due to lack of experience & non Availability of spinal Epidural needles & Sensorcaine.
Discussion: Role of Indian Medical mission was to augment & enhance the existing Anesthesia practice at Balkh hospital as per WHO guide lines. Over a decade of work more Anesthesia technicians are trained now to administer safe & effective Anesthesia in north Afghanistan.
Conclusions: Afghanistan is slowly recovering from decades of War & conflict. This must be alarming for WFSA that Anesthesia is hardly considered as a specialty in Afghanistan. I take this opportunity to urge the WFSA & International community to come forward for training & provision of equipments & drugs for this Young Republic.

References

1 WHO, meeting on GIEES (global initiative for emergency & essential surgical care) 24-25 Sep 2007 DAR-Es-SALAAM, TANZANIA
2 Wikipedia
3 Meena cherian et al. Bulletin of the WHO Article DOI:10.2471/BLT.09.072371 4. Joint WHO and min of Public health Evaluation mission on Integrated Management for emergency & essential surgical care (IMEESC) 31 Aug-05 Sep 2006
4 5. 3. Report of National workshop on Medical education in Afghanistan who Kabul Jun 200

Paper No: 1010.0

The risk of co in patients undergoing general anaesthesia inhalation

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Introduction: CO is generated inadvertently within anaesthesia machine due to halogenated anaesthetics and soda lime interaction not only with low flow techniques but with 2-3 l/min supplies too. Detection and control of the COHb levels are not yet routine procedures, thus intra-anaesthetic toxicity risk is possible. Actually it is impossible to know how many times post-operative symptoms of CO poisoning have occurred unnoticed just because it hadn't been thought.
Objectives: Our objective is to demonstrate that CO may appear in anesthesia circuits, occupying as is well known the O2 place in the Hb molecule and moving it out according to CO concentration level, even with a low-risk considered agent as Sevoflurane traditionally was. Thus may be proved that levels of CO in the circuit or most specifically the formation of COHb must be monitored when inhalation anaesthetics are supplied.
Methods: A 40 adult patient series (18 males and 22 females) going under general anaesthesia with Sevoflurane (n=20) and Isoflurane (n=20) was studied, investigating the presence of COHb. In all the cases a FiO2=1.0 was deliberately supplied. Measurements were made with a Masimo RAD-57 COoximeter device.
Results: In those patients undergoing Isoflurane anaesthesia the minimum COHb average concentration was 3.8% and the maximum average concentration was 5%; while for Sevoflurane the lowest average concentration was 2.55% and the maximum average concentration 6.3%. This implies a 31.5% average increase for Isoflurane and 147% for Sevoflurane. High value in the latter is mostly due to 3 of the cases where COHb increase was 433,33%, 325% and 300% respectively, influencing the average for this agent. The concentration dropped in 4 cases with Isoflurane and 1 with Sevoflurane. Discussion On the contrary to what might be expected according to the information provided by other authors, we have found most significant elevations of the COHb with Sevoflurane than with Isoflurane. Even in those cases in which COHb declined, this occurred in more occasions with Isoflurane than with Sevoflurane. However concentrations of COHb have not been correlated with CO circuit concentrations. Conclusion Despite of the presence of high O2 inhaled concentrations the most of procedures with any of both agents produce significant CO increases. Sevoflurane had proved to be at least as capable as Isoflurane to produce meaningful COHb levels. Therefore, it is well demonstrated the need to detect CO presence in anaesthesia circuits to avoid from reaching unnoticed toxic levels.

References

1 ANMAT Disp. 4182 sobre Exped. 1-47-12953-10-1
2 Baxter PJ, Garton K, Kharasch ED. Mechanistic aspects of carbon monoxide formation from volatile anesthetics. *Anesthesiology* **89**: 929–941, 1998.
3 Crego EV Toxicidad de los anestésicos inhalatorios. U.B.A. http://www.fmed.uba.ar/depto/toxico1/tox_anestesicos_inhalatorios.pdf, 2009.
4 "Ellenhorn's Medical Toxicology". 2nd Edition, Williams & Wilkins Edit., pág. 1465-1474.
5 Fang ZX, Eger EI. Source of toxic CO explained: -CHF2 anesthetic+ dry absorbent. *Anesthesia Patient Safety Foundation Newsletter* 1994, **9**: 25–36.
6 Levy RJ *et al.*.: Detection of carbon monoxide during routine anesthetics in infants and children. Anesth Analg. 2010 Mar 1; **110**(3):747–53. http://www.masimo.com/rad-57/index.htm. Accessed February 2, 2006.
7 "Miller's Anesthesia". Ronald D. Miller; 6th Edition, Elsevier Edit., pág. 297-298, 1447-1448.
8 Neil B Hampson MD, Erika D Ecker, Karen L Scott MA Use of a Noninvasive Pulse CO-Oximeter to Measure Blood Carboxyhemoglobin Levels in Bingo Players. *Respiratory Care*. July 2006 Vol 51 No 7.

9 "Toxicología Fundamental" Repetto M.; Edit. Díaz de Santos, 3a edic., pág. 124.
10 Wissing H, Kuhn I, Warnken U, Dudziak R Carbon monoxide production from desflurane, enflurane, halothane, isoflurane, and sevoflurane with dry soda lime. *Anesthesiology* 95: 1205–1212, 2001.

Paper No: 1011.0

Evaluation of the impact of stress in anesthesiologists in rio Negro, Argentina

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Introduction: Laboral stress is considered as a factor in a harmful health effects. Impaired psycho-emotional, physical illness, intellectual disorders, family and employment consequences, decreased quality of patient care and lack of commitment to medical practice. In the medical population the incidence of occupational stress is 28% in the Latinamerican anesthesiologists reaches values of 64%.
Purpose: To determine the degree of professional burnout in Anesthesiologists in Rio Negro Province, Argentine and the influence of different factors affecting this condition.
Materials and methods: This is a transverse descriptive study. The anesthesiologists were surveyed with a self-administered questionnaire using Google Docs forms. 32 anesthesiologists participated in Rio Negro Province, Argentine. The questionnaire included: a) the Maslach Burnout Inventory (MBI), that assesses Depersonalization (DP), Personal Accomplishment (PA), and Emotional Exhaustion (EE); b) social and demographic variables.
Results: The questionnaire was answered by 41% of anesthesiologists members of Rio Negro Association of Anesthesiology, of which 50% were male, the average age of the respondents was 46, and50% were female, the average age was 48,6. Of the anesthesiologists surveyed 4 working in the public system, 17 in the private system and 11 in both Of the respondents, The average score values obtained using the different scales were 23.59 ± 12.83 points for EE, 4.81 ± 5.07 points for DP and 5.30 ± 42.65 points for the PA, results that place participants in a medium degree of EE, low depersonalization DP and high personal accomplishment (PA) 25% had high levels of Emotional Exhaustion Burnout, 12, 5 % had high levels of depersonalization Burnout and 78,2 % had high levels of Personal Accomplishment Burnout. Burnout syndrome was observed in one female anesthesiologist.
Conclusion: The degree of professional burnout in Argentine Anesthesiologists of Rio Negro, Argentina is lower than that found in other countries. Burnout syndrome was present in one anesthesiologist. In the study was found Depersonalization and Emotional Exhaustion in low levels and high percentage of Personal Accomplishment, especially as far as rates of are concerned.

Keywords: Burnout; stress in anesthesiology; prevalence in anesthesiologists; anesthesiologist professional risk

References

1 Mingote, A.J.C. Perez-Corral F: El Estres del Medico. Madrid, Espana: Ed. Diaz de Santos, 1999; 41-59.
2 Diaz-Gonzalez HR. Estudio de la influencia de los factores laborales y sociodemocraticos en el desarrollo del síndrome de agotamiento profesional en el area de medicina especializada del INSALUD de Avila. Med-Clin-Barc.1994; 103(11): 408-412.
3 M.A. Sánchez-Madrid, A.D. Delgado-Martínez y D. Alcalde-Pérez (2005) Prevalencia del síndrome de burnout o desgaste profesional en los cirujanos ortopédicos de España Servicio de Cirugía Ortopédica y Traumatología. Rev Ortop Traumatol.; **49**:364-7
4 Calabrese G. . (2006): Impacto del estrés laboral en el anestesiólogo Rev. Col. Anest. vol.34 no.4

Paper No: 1029.0

Influence of Temperature and pH change on Propofol Injection Pain

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Propofol is a widely used intravenous anesthetic agent(1). However, besides its frequent usage propofol associated injection pain is not rare with an incidence of 28-90% in adults. Manufacturer denotes that it can effectively be used between 4-37°C. In this study, we aimed to investigate the influence of two storage techniques, room temperature versus fridge, on propofol injection pain. After hospital ethic committee approval and informed consent obtained, 100 ASA I-II patients undergoing gastroenterological or urological surgery were randomized to two groups. All patients were informed about "six point verbal rating scale (VRS)" before anesthesia induction. Those with allergy to propofol, cardiovascular instability, lipid metabolism disorder and mental problems were not included into the study. After routine monitorization, a 20G ÝV catheter was placed on dorsum of the hand of patients. In the first group 5 mL of propofol stored at room temperature, and in the second group 5 ml of propofol, stored in fridge was given within 10 seconds and VRS was questioned. Remaining propofol was put into a measuring cup, and temperature and pH values were measured via ADWA AD 12 Waterproof pH testers. Demographic data, hemodynamic parameters (baseline, after 5 ml injection and after induction), temperature and pH values of propofol, and VRS scores were recorded. Demographic data of the patients were similar in both groups. In both groups,

hemodynamic measurements (systolic blood pressure, diastolic blood pressure, and heart rates) were noted to decrease significantly with anesthesia induction with no significant difference between the groups. Mean ± standard deviation of propofol temperature, and pH of the first, and second groups were 23.18 ± 1.13°C, and 7.33 ± 0.08, and 17.71 ± 3.09°C, and 7.46 ± 0.05 respectively. Propofol associated pain was seen in 70% of patients in the first group whereas, it was seen in 80% of patients in the second group. VRS score was 5 in 8, and 30% of the patients in the first, and second groups respectively. None of the patients had a VRS score 6 in both groups. Median VRS was 2 in the first group, whereas, it was 3 in the second group (p=0.043). Our results demonstrated that pH levels and the incidence of propofol associated pain was higher in patients receiving propofol stored at fridge compared to propofol stored at room temperature. Although topical cold application believed to have some anesthetic effects, it did not decrease propofol associated pain when administered intravenously. Besides, as the drug got cooler, pH levels changed towards alkaline side (from 7.33 to 7.46). This might probably be responsible for increased pain. Up on preliminary results, derived from this study, we hope to find out concrete findings with larger samples.

Reference

1 Laurila T. Sorvajärvi T. Saarela J. Optical detection of the anesthetic agent propofol in the gas phase. Anal Chem. 2011 May 15;83(10):3963-7. Epub 2011 Apr 28.

Paper No: 1055.0

Role of Anaesthesiologist in decreasing Carbon Foot Prints In view Of Global Concerns over the Greenhouse Effect

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Introduction: During administration of General Anesthesia, volatile agents are used most of the times for maintenance of anesthesia, which often vented into the atmosphere have powerful Greenhouse properties to many million patients each year around the world. As an anaesthesiologist it is our duty to think about the carbon foot prints we are leaving for our coming generations. Because of their effects on the ozone layer, emission of chlorinated hydrocarbons is to be banned by international agreement from the year 2030. As fluorinated hydrocarbons, Isoflurane and Sevoflurane contribute less as compare to Desflurane to the destruction of the ozone layer but their`greenhouse gas' capacity is ten times that of carbon dioxide; regulations to reduce such emissions were established at the Kyoto Conference of 19971.

Objective: We should improve the environmental footprint by choosing anesthetics that produce less potent greenhouse gasses.

Methods: A detailed quesstionnare is sent to practicing anaesthesiologists about thereviews.

Results: Responses were like as To reduce the carbon footprints caused by anaesthetics gases we can adopt various ways like as:

(1) Use of regional anesthesia as an alternative to general anaesthesia whereever possible.
(2) Use of gases which have less impact on our environment.
(3) Use of xenon as it is an inert gas and it produces no carbon footprints.
(4) Avoid N2O as a carrier gas unless there is a clinical reason to prefer it changes to Air & Oxygen as Carrier gas.
(5) Avoid unnecessarily high FGF rates, particularly when using desflurane. In India in our institution we are prefering regional anaesthesia whereever we can avoid the general anaesthesia. As in cases of Ludwigs Angina we are using Cervical Plexus Block2, in Cases of Mastectomy we are using thoracic Epidural and regional for most of the peadtric population.

Discussion: As most of our volatile agents which we are using has longer "lifetime" in the atmosphere as the results showed that desflurane had a much longer "lifetime" in the atmosphere than the other anesthetics studied: 10 years, compared to 1.2 years for sevoflurane and 3.6 years for isoflurane3. Using desflurane as maintenance agent for one hour is equivalent to 235 to 470 miles of driving, according to the study3.

Conclusion: If every anesthesiologist uses the gas with the least impact, the emissions would equal the greenhouse gas impact of about 100 passenger cars each year and if uses the most environmentally damaging anesthetic, emissions would be roughly 12 times higher. And if we use regional anaesthesia whereever its applicable then we as anaesthesiologists can do more than expected for environment.

References

1 Marx T. Umwelt und Arbeitsplatzbelastung durch Anasthesie (Environmental and workplace pollution by anaesthesia). *Anasthesiol Intensivmed Notfallmed Schmerzther* 1997; **32**: 44–6.

2 Cervical Plexus Block: An Alternative for decompression of Ludwids Angina. British Journal of Anaesthesia 2009 http://bja.oxfordjournals.org/cgi/qa-display/short/brjana_el;5072.

3 Ryan SM, Nielsen CJ. Global warming potential of inhaled anesthetics: application to clinical use. *Anesth Analg*. 2010 Jul; **111**(1): 92–8.

Paper No: 1057.0

A Study of lnhalation Sedation of Nitrous Oxide with Adjunctive Use of a Lo — Concentration of Sevoflurane on Severely Handicapped Patients for Dental Treatment

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Introduction: The sedative effect of inhalation sedation of nitrous oxide with adjunctive use of lo – concentration of sevoflurane on severely handicapped patients for dental treatment was studied.

Objectives: The study consisted of 215 patients who received dental treatment last three years. The patients were divided into two groups. The first group was the Mask Group which involve 129 patients including those who could not be given intravenous sedation due to too difficult venipuncture, micrognathia, low respiratory function,@or ineffective intravenous sedation. The second group was the Tracheotomy Group which consisted of 86@patients and including those who received tracheotomy or tracheoesophageal diversion due to frequent aspiration pneumonia caused by cerebral palsy. The protocol was appoved by the institutional review board of the hospital. iMethodsj The technique was induced with 50% nitrous oxide, oxygen, and 0.1̀0.5% of sevoflurane using a face mask in the Mask Group, and a circuit was connected directly to the tracheotomy hole in the Tracheotomy Group. @After the appropriate level of sedation was obtained, the face mask was removed and was changed to a nasal mask in the Mask Group. The level of sedation was scored into five grades by the dental anesthesiologist and the dentist according to the performance of the procedures. Heart rate, blood pressure, SpO2, EtCO2 and respiratory rate were monitored.

Results: As a result, the level of sedation was sufficient in both groups, and the score was higher in the Tracheotomy Group than in the Mask Group. A transient decrease of Spo2 of less than 89% was observed in 13 patients in the Mask Group, and only one in the Tracheotomy Group only.

Discussion: The technique is thought to be effective and safe on severely handicapped patients. And it is thought that the technique is more effective and safe on those who have received tracheotomy or tracheoesophageal diversion. The reasons are considered that the leakage anesthetics and contamination of air of the circuit is limited, and the occurrence of aspiration of saliva or water is less.

Conclusion: The technique is thought to be effective and safe on severely handicapped patients.

References

1 Lahoud GYG et al : Anaesthesia, 56:476-480,2001.

2 Haraguchi N et al:J Oral Maxillofac Surg,53:24-26,1995.

Paper No: 1070.0

Laparoscopic cholecystectomy in a patient with eventration of left hemidiaphragm-a case report

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Introduction: Eventration of the diaphragm, a rare anomaly, is an abnormal elevation of one leaf of an intact diaphragm as a result of paralysis, aplasia or atrophy of varying degree of muscle fibres. The unbroken continuity differentiates it from diaphragmatic hernia. Eventration can be diagnosed by elevation of the affected dome of diaphragm on chest X-ray. Asymptomatic patients are managed conservatively but all patients with significant symptoms require surgery.

Case Report A 55-yr-old, 86 kg, 5'3" female, well controlled diabetic and hypertensive with multiple gallstones was scheduled for laparoscopic cholecystectomy. Her preanaesthetic evaluation was unremarkable except for absent air entry in the right middle and lower chest. Chest X-ray showed raised diaphragm on the left side, with bowel loops in the left hemithorax and the echocardiography revealed left ventricular (LV) ejection fraction 60%, reduced LV compliance, pulmonary artery systolic pressure of 40 mmHg, dextro position and no left ventricular regional wall motion abnormality. After preoxygenation for 5 minutes in 25 degree head up position, a modified rapid sequence anaesthesia induction was used employing succinylcholine. Airway was secured with a standard 7.5 cuffed orotracheal tube and the patient was mechanically ventilated with volume controlled mode to maintain an end-tidal carbon dioxide tension between 36-44 mm Hg.

Anaesthesia was maintained using oxygen and air, with propofol infusion, vecuronium boluses and supplemented with fentanyl. At start of carboperitoneum, the patient developed tachycardia, hypotension, desaturation and atrial ectopics appeared. These changes were self limiting and settled over a few minutes. Laparoscopic examination confirmed the eventration of left hemidiaphragm with bowel loops and omentum occupying the thorax. As the patient was completely asymptomatic, the surgeon decided not to do diaphragmatic repair. The intraoperative course was uneventful. At the end of the procedure, anaesthesia was discontinued and residual neuromuscular paralysis was reversed. The trachea was extubated and the postoperative course was uneventful. The ABG reports both in the intraoperative and the postoperative course were within normal limits. She was discharged the next day.

Reference

1 Thomas TV. Congenital eventration of diaphragm. *Ann Thorac Surg* 1970; **10**(2) :180-192.
2 Urschel HC, Disiere J, McQuirter WM. Current Therapy in Cardiothoracic surgery in eventration and plication. *Philadelphia Decker* 1989, 258-259.
3 Stauffer UG, Rickham PP. Acquired eventration of the diaphragm in the newborn. *J Peadiatr Surg* 1972; **7**:635-640.
4 Connors RH, Weber TR, Randolph JG. *Glenns Thoracic and Cardiovascular surgery in the diaphragm: Developmental, traumatic and neoplasticdisorders*. 5th ed); CT Prentice Hall East Norwalk; 1991 pp.531-543.

Paper No: 1114.0

"Guinness Record" for biggest ruptured abdominal aortic aneurysm, a clinical success

Pedro Freire, **Maria Pimentel**, Paula Ribeiro and Cunha Falção

Background: Most of the arterial aneurysms are located in the abdominal aorta, between the renal and the inferior mesenteric arteries. (1) Although in the last years, the overall morbidity and mortality rates have diminished for elective surgeries (mortality <5%), mortality rate in emergency repair of a ruptured aneurysm is still >50%. (2)
Case report: A 79 year-old man with known history of 2 previous strokes, cerebral aneurysm, chronic obstructive lung disease, hypertension, chronic renal failure and anemia-previous hemoglobin (Hb) 8.8g/dL, was admitted to a local peripherical hospital for 2 episodes of lipothymy and diffuse abdominal pain. He presented pale and sweaty. Arterial blood pressure (BP) was 100/60mmHg and heart rate (HR) 95 heart-beats per minute (hpm). On the physical examination a painful non-mobile hard consistency mass was palpated in the hypochondrium all the way to the epigastrium. A computerized tomography scan showed a 26cmx13cm abdominal aortic aneurysm (AAA) in rupture; Hb at the time was 7.3g/dL and the patient was transferred to our hospital after contact with Vascular Surgery. On arrival to the Emergency Room BP was 110/77mmHg, HR 103hpm and Hb 6.5g/dL. Transfusional support was initiated. After referring acute abdominal pain, the patient makes a respiratory arrest with possible aspiration. He was intubated and transported to the Operating Room. An aortic-aortic interposition with Dacron prosthesis was made under general anesthesia. An arterial line, a 3-way central catheter and bispectral index monitoring were placed. During surgery the patient was hemodynamically unstable; colloids and crystalloids were administered, transfusional support continued and infusion of dobutamine and noradrenaline started. Time of aortic clamping was 90 minutes and minimal systolic BP was registered immediately after aortic declamping (<30mmHg). Intra-operative blood loss was approximately 5 liters and urinary output was 230mL. After surgery the patient was admitted to the Intensive Care Unit and remained sedated and intubated for 2 more days. On the 6th day vasopressor amines were suspended. The patient was transferred to the Vascular Surgery infirmary on the 9th day after surgery and was discharged from the hospital 39th.
Conclusion: Ruptured AAAs are life-threatening surgical emergencies that require experienced vascular surgeons and anesthesiologists. The declamping time is the most critical moment of the surgery, possibly leading to extreme hypotension and death. It is therefore of extreme importance to anticipate and prepare for this moment. All in all, despite all odds, sometimes patients have a way to surprise us.

References

1 http://www.uptodate.com/contents/epidemiology-clinical-features-and-diagnosis-of-abdominal-aortic-aneurysm?source=search_result&search=aortic+aneury sm&selectedTitle=4~150
2 http://www.uptodate.com/contents/natural-history-and-management-of-abdominal-aortic-aneurysm?source=search_result&search=aortic+aneurysm&selected Title=3~150

Paper No: 1124.0

The role of the international anaesthetist in the professional training and ot management of the anaesthesia nurses. 12 years of experience of emergency Italian NGO in Afghanistan

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Introduction: Afghanistan won independence from British in 1919. From 1979 to 1989 Soviet touching off a long and destructive war. Following years of Civil War, Kabul fall to the Taliban in 1996. After 9/11, a US and anti-Taliban Northern Alliance military action toppled the Taliban and in 2004, KARZAI became the first democratically elected president of Afghanistan. Definitely this events cause decades of non educational and professional growing. Emergency has opened 3 hospital in Afghanistan: -1999, Surgical Centre in the Panjshir Valley (Anabah). -2001, Surgical Centre in Kabul -2003, Surgical Centre in Lashkar-gah and a Maternity Centre in Anabah. Kabul Medical University has the only baccalaureate-level nursing program in the country that provides: primary anaesthesia, low technology skills and pharmacological core issues. Certificated nurses after two years in Anaesthesia School graduate as Anaesthesia Technician.
Objective and Methods: In Afghanistan the daily hospital presence of a MD certificated in Anaesthesiology is unusual. Emercency's hospital host, all year round, an international MD Anaesthetist who is responsible for theatre and ICU activities. Although he is in charge for: -training and re-training the

national staff -organize refreshing courses and lectures -improve skills and guidelines in OT with respect to the "primary anaesthesia" issue in developing countries -sharing the latest critical care guidelines in respect of the Country resources -enhancing the work of the staff in the sub-specialised field of War Surgery -training senior anaesthesia nurses as tutor reference for future/training nurses -create new professional skills and responsibilities -test emergency scenarios (mass casualties and in-hospital emergency)

Results: Our hospital in Kabul has an agreement with the Ministry of Public Health (MoPH) to allow our anaesthesia nurses to be admitted to the graduating examination at the MoPH-HRD. The anaesthesia staff is in charge of in-hospital emergencies ad has to be trained for a specific BLS course. New skills have been introduced as the IJV infusion, selective spinal anaesthesia, management of the difficult intubation, laryngeal mask, paediatric anaesthesia, new drugs.

Discussion and Conclusion: Our aim is to qualify and make the national anaesthesia staff autonomous and, as much as possible, professionally safe. We have anaesthesia nurses who are tutors for the new generation, well skilled in managing any emergency and with an updated knowledge of available pharmacology. Moreover few of them are responsible for the BLS training. The management of the patient is all-round respected as we use to respect in our western countries.

Paper No: 1125.0

The utility of pre-operative troponin elevation in determining postoperative mortality in vascular surgical patients

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Introduction: Recent studies have suggested that pre-operative evaluation of cardiac troponin I (cTnI) levels may be appropriate for risk stratification of vascular surgical patients scheduled for peripheral vascular surgery. (1,2) However, it is unknown whether pre-operative cardiac troponin evaluation has clinical utility, in the presence of risk stratification using the Revised Cardiac Risk Index (RCRI) in vascular surgical patients.

Objectives: The aim of the study was to determine the utility of pre-operative troponin levels in determining post-operative 30 day mortality in vascular surgical patients.

Methods: This is an observational cohort study conducted between April 2008 and October 2010. Local ethics approval was obtained. All patients had the RCRI risk factors and pre-operative cTnI collected prospectively. Mortality within 30 days of surgery was recorded. Categorical data was analysed using the Fisher's Exact Test. Continuous data were compared using independent samples t-test. Binary logistic regression analysis was conducted to determine independent predictors of 30 day mortality using a backward stepwise modelling technique. The odds ratio for mortality and 95% confidence intervals are reported.

Table 1. Pre-operative characteristics of patients

	Survived	(n=520)	Died	(n=42)	P-value
Age	59	(13.5)	62	(13.7)	0.57
Male gender	332	(63.8%)	23	(54.8%)	0.25
Supra-inguinal vascular surgery	50	(9.6%)	10	(23.8%)	0.01
Diabetes mellitus	224	(43.1%)	20	(47.6%)	0.63
Congestive Cardiac Failure	28	(5.4%)	5	(11.9%)	0.09
Ischaemic Heart Disease	198	(38.1%)	18	(42.9%)	0.62
Cerebrovascular Accident	140	(26.9%)	5	(11.9%)	0.04
Creatinine >177 μmol/L	12	(2.3%)	6	(14.3%)	0.001
Elevated preoperative cTnI	43	(8.3%)	11	(26.2%)	0.001
Data expressed as mean (SD); number (%)					

Table 2. The association between the RCRI and pre-operative cTnI and 30 postoperative mortality

Odds ratio	95%confidence interval	P-value	Univariate analysis
RCRI	1.3	0.95-1.7	0.10
Preoperative cTnI	3.9	1.8-8.4	<0.001
Adjusted RCRI	1.1	0.9-1.5	0.37
Preoperative cTnI	3.6	1.6-7.9	0.001
Multivariate analysis Preoperative cTnI	3.9	1.8-8.4	<0.001

Results: Fifty four (9.6%) of the 562 patients had an elevated pre-operative cTnI (>0.1ng.ml-1). The 30 day mortality was 42 (7.5%). The preoperative characteristics of the patients are shown in Table 1.

The univariate, adjusted and multivariate analysis of the associations between the RCRI and the pre-operative cTnI, and 30 day mortality are shown in Table 2.

Conclusions: Pre-operative troponin elevation is an independent predictor of 30 mortality following vascular surgery.

References

1 Gibson SC, Marsh A, Berry C, Payne C, Byrne DS, Rogers PN, *et al.* Should pre-operative troponin be a standard requirement in patients undergoing major lower extremity amputation? *Eur J Vasc Endovasc Surg* 2006; **31**(6):637-41.

2 Sarveswaran J, Ikponmwosa A, Asthana S, Spark JI. Should cardiac troponins be used as a risk stratification tool for patients with chronic critical limb ischaemia? *Eur J Vasc Endovasc Surg* 2007; **33**(6):703-7.

Paper No: 1131.0

The influence of preoperative overnight fasting under insulin resistance in patients to undergo a videolaparoscopic cholecystectomy

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Introduction: The concept of preoperative overnight fasting was challenged and prove to have no benefits before surgery, and may involve a more prolonged time (i.e., 16-18h). That has been shown to induce insulin resistance (IR), can be defined as a situation that occurs the biologic response to insulin is reduced compared with the normal situation.
Objective: This study aims to analyze the influence of duration of preoperative fasting on insulin resistance and also relates it to the presence of nausea and vomiting after surgery.
Methods: Under general anesthesia, 26 patients were selected to undergo elective videolaparoscopic cholecystectomy at the Clinic Hospital of Universidade Federal do Triângulo Mineiro in Uberaba-MG (UFTM), divided into two groups (G): G1 with 12 patients who stayed more than 12h59min fasting and G2 with 14 patients undergoing lower time than that. Blood samples were collected in three moments (M): M1 immediately before induction of anesthesia, M2 and M3, 6 and 12 hours respectively. Insulin resistance was analyzed using the method Homeostasis Model Assessment-HOMA, and for statistical analysis Mann-Whitney and Chi-Square, p <00.5, considered statistically significant. Glucose was analyzed in three stages and the presence of nausea and vomiting in M3. Results: the average time of fasting for G1 and G2 were 15h37mim and 11h9mim respectively. The average fasting blood glucose values were higher in M3 for the two groups. Insulin resistance was also increased, reaching maximum values in M3 for both groups. The duration of preoperative fasting did not influence the levels of insulin resistance at M1, M2 or M3, and the same can be said on glycemia, nausea and vomiting.
Discussion: In this study there was no relationship between the duration of fasting and insulin resistance.
Conclusion: Similarly to the situation in the fasting state, insulin resistance develops after surgery. That has been shown to be related to the magnitude of the surgery performed and fasting. This data does not support adverse affects of prolonged fasting in videolaparoscopic cholecystectomy.

References

1 Mendelson CL. The aspiration of stomach contents into the lungs-during obstetric anesthesia. *Am J Obstet Gynecol*.1946; **52**: 191–205.
2 Soreide E, Ljungqvist O. Modern Preoperative Fasting Guidelines: a summary of the present recommendations and remaining questions. *Best Practice & Research Clinical Anaesthesiology*. 2006; **3**: 483–91.
3 Aguilar-Nascimento JE, Caporossi C. Alta precoce em colecistectomia. *Ver Col Bras Cir*. 1992; **19**: 152–5.

Paper No: 1150.0

Preoperative remifentanil test used to predict its requirement and adverse events: a prospective cohort study

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Introduction: Patient characteristics affect analgesic opioid requirements and adverse events. The purpose of this study was to show that a preoperative remifentanil test, i.e. the required dose to cause dizziness in the patient, can predict its analgesia dosage requirement and adverse events during extracorporeal shock wave lithotripsy (ESWL) procedure.
Method and Material: 165 patients were enrolled of which five were excluded (n=160). Patients were requested to report any dizziness 1 min immediately after injection with 0.25 μg/kg intravenous remifentanil. Ninety six patients were grouped as sensitive with respect to preoperative remifentanil test dose. Sixty four subjects, who did not report any dizziness, were categorized as resistant. The pain score, sedative and narcotic analgesia requirement, and the incidence of adverse events (apnea, bradypnea, desaturation, bradycardia, hypotension, nausea and vomiting) were recorded.
Results: Patients in sensitive group were older than those in the resistant group (47.3 ± 12 vs.42.7 ± 12 year; $p<0.05$), had a lower male to female ratio (37/59 vs. 44/20; $p<0.05$), and fewer opioid abusers (13/83 vs. 23/41; $p<0.05$). Sensitive patients perceived more pain (1.7 ± 0.6 vs. 1.4 ± 0.4; $p<0.05$); however, they requested smaller remifentanil dose for analgesia (57.3 ± 29.7vs. 88.8 ± 58 μg; $p<0.05$) and experienced fewer respiratory adverse event ($p<0.05$). Duration of ESWL procedure, weight, height, ASA physical status were similar between groups.

Conclusion: In conclusion, preoperative remifentanil test can be a reasonable modality to predict patients' narcotic analgesia requirement and the adverse events.

Paper No: 1152.0

Identification of systems based improvements for trauma care at the National Tertiary Hospital In Uganda

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Background: Injury is a leading cause of morbidity and mortality in low and middle income countries (LMICs)1. According to WHO data more than 90% of deaths due to injury occur LMICs. Interventions aimed at early hospital care are essential and it has also been shown that better organization and utilization of current resources, can provide a sustainable cost-effective model for improved injury care in a resource-limited environment2-3. However, there remains limited data for the existing process of trauma care, thus limiting identification of potential targets for improvement. We therefore performed a prospective observational study to characterize the injured population, triage process and initial trauma management in Uganda, with the intention of using these data to propose sustainable improvements.
Methods: Subjects were those who presented with traumatic injury, during a one month period, at Mulago National Referral Hospital emergency department (ED), Kampala Uganda. Data were collected from time of arrival until transfer/discharge from ED, including demographics, injuries, timing of assessments and medical/other interventions.
Results: We observed 397 subjects. Male to female ratio 3:1, 47% were 19-29 year olds, road traffic accidents the most common presenting mode of injury (53.2%) Study sample demographics also correlated with prior records from Mulago Hospital4-6. Mean time of arrival to first physician encounter approximately 1 hour, which did not vary significantly between day and evening nor weekday and weekend. We noted an inconsistent availability of triage staff. Very few patients ($<$11%) had a vital sign recorded, only 2.9% of patients had both blood pressure and respiratory rate measured.
Conclusion: In spite of inconsistent availability of support staff, the relatively short wait time shows the remarkable adaptability of these physicians working in resource limited environments. We observed only limited recording of objective data of severity of injury and it was evident that some patients would have significantly benefited from additional evaluation, interventions and monitoring prior to transfer to the wards. We conclude that the quality of care could be sustainably improved through locally driven interventions e.g. protocols for triage, vital signs, and evaluation. This may also allow for a more effective distribution of resources, e.g. additional monitoring of patients in a high dependency unit. We propose to use these baseline data to compare the efficacy and impact of interventions in a subsequent study of objective improvements to casualty care. We hope this will ultimately impact morbidity and mortality associated with injury in Uganda.

References

1 Hofman K, *et al.* "Addressing the growing burden of trauma and injury in low- and middle- income countries." *American Journal of Public Health* **(95)**: 13–17, 2005.
2 World Health Organization. Guidelines for essential trauma care; Eds. Mock C, *et al.* Geneva, Switzerland, 2004.
3 Mock C, Arreola-Risa C, Quansah R. "Strengthening care for injured persons in less developed countries: A case study of Ghana and Mexico." *International Journal of Injury Control and Safety Promotion* **(10)**: 45–51, 2003.
4 Injury Control Center – Uganda. "Uganda trauma registry: Hospital Based Injury Surveillance Results; Period January to June, 2010." Provisional results as
5 Hsia R, *et al.* "Epidemiology of injuries presenting to the national hospital in Kampala, Uganda: implications for research and policy." *International Journal of Emergency Medicine* **(3)**: 165–172, 2010.
6 Demyttenaere S, *et al.* "Injury in Kampala, Uganda: 6 years later." Canadian Journal of Surgery **(52)**: E146–E150, 2009.

Paper No: 1161.0

Effect of smoking on neuromuscular relaxation time with cisatracurium besylate during general anesthesia

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Introduction.
Objective: Measure and compare the duration of neuromuscular relaxation with cisatracurium besylate to demonstrate the prolonged smokers patient compared to non-smoking patients during general anesthesia.
Methods: Conducted a prospective, longitudinal, experimental, observational study, two groups included both under general intravenous anesthesia. In group 1 with smoking history and in group 2 patients without smoking history. ASA was compared, age, weight, height, temperature, BMI, arterial blood gas analysis, the TOF to 25%, 50%, 70% and 90% in both groups. Statistical analysis was performed with T Student and Chi square. Results: 105 individuals were studied, classified into two groups: 56 of the smoking group and 49 without smoking. There were no statistically significant differences in demographic data, ASA and blood gas values. It was demonstrated that neuromuscular recovery

to 25% in group 1 was 68.14 ± 21.34 minutes which was significantly higher in group 2: 59.08 ± 15.34 minutes (p=0.013), recovery of TOF to 50% in group 1 was 81.30 ± 20.17 minutes, which was higher than in group 2 which was 70.75 ± 15.33 minutes (p=0.003), the recovery of TOF to 70% in group 1 was 92.00 ± 20.42 minutes, which was greater than in group 2 to 85.00 ± 16.65 minutes (p=0.05), recovery of TOF to 90% in group 1 was 104.01 ± 20.51 minutes which was higher than in group 2, which is 94.61 ± 15.9 (p=0.01).

Conclusion: The neuromuscular relaxation time of cisatracurium besylate is prolonged in smokers compared to non-smokers during general anesthesia.

References

1 Chandra R. The effects of cigarette smoking on anesthesia. Anaesthesiology 2001; **47**:143–150.

2 Teiria H, Rautoma P, Yli-Hankala A, Effect of smoking on dose requirements for vecuronium. Br J Anaesth. 1996; **76**:154–155.

3 Latorre F, de Almeida MC, Stanek A, et al: The interaction between rocuronium and smoking. The effect of smoking on neuromuscular transmission after rocuronium. Anesthetist. 1997; 4**6**:493–495.

4 Puura AIE, Rorarius GF, Laippala P, et al: Does abstinence from smoking or a transdermal nicotine system influence atracurium induced neuromuscular block?. Anesth Analg. 1998; **87**:430–433.

5 Lee C. Train-of-4 quantitation of competitive neuromuscular block. Anesth analg 1975;**54**:649–653.

6 Hemmerling M. Thomas. Brief review: Neuromuscular monitoring: an update for the clinician: Can J Anesth 2007;**54**: 58-72.

Paper No: 1169.0

The Comparison of Volume and Pressure Controlled Ventilation in Laparoscopic Cholecystectomy

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Introduction: Objectives The laparoscopic cholecystectomy has some systemic disadvantages by caused of elevated intraabdominal pressure, position, and general anaesthesia eventhough has lot of advantages (the short lenght of hospital stay, minimally postoperative pain, rapidly recovery). In this study, the effects on hemodynamic respiratory and blood gas parameters were compared by applying Volume Controlled Ventilation (VCV) and Pressure Controlled Ventilation (PCV) in laparoscopic cholecystectomy anaesthesia. Methods This study was performed using randomization method after approved by the ethic commitee 70 volunteer ASA 1-2 physical status patients who were diagnosed cholelithiasis by surgeons and scheduled for elective laparoscopic cholecystectomy were included in this study in all patients, Cardiac rate by EKG, SpO2, OAP by brachial noninvasive blood pressure, EtCO2, BÝS, TOF monitorization were performed. The patients ages, body heights, BMI, and medical history was recorded on preoperative period. In all patients, general anaesthesia was induced with iv propofol 2-3 mg/kg, iv fentanyl 1-2 mcg/kg, iv rocuronyum 0,5-0,6 mg/kg, anaesthesia was maintained with a iv propofol infusion 4-8 mg/kg/hour and mixture of nitrous oxide (50%) and oxygen (50%) analgesia was maintained with iv fentanyl 1-2 mcg/kg . The patients were divided into two groups randomly according to the applied mechanical ventilator mode: Group 1 (35 patients) PVC, Group 2 (35 patients) VCV. Patient's hemodynamic datas and respiratory parameters, arterial blood gases were measured, the patient's allertness were evaluated and recorded by measuring eye tearing and pupil diameter. Dynamic compliance, oxygenation index, alveolar – arterial oxygen gradient, dead space tidal volume ratio were calculated.

Results: There was no difference between the groups in demographic datas (age, height, weight) and operation, and anaesthesia, pneumoperitoneum and wake up times (p >0,05). BIS and heart rate were significantly higher in Group 1 than Group 2 after removal of the gall bladder. Respiratory frequency was higher in Group 2 at 20 minutes after insufflation and at removal of the gall bladder (p<0,05). The dead space ventilation tidal volume ratio at the measurements before pneumoperitoneum and alveolar –arterial oxygen gradient at the measurements after pneumoperitoneum were significantly higher than in Group 1 (p<0,05). Dynamic complians were similar in two group.

Conclusion: It was found that tidal volume was higher and alveolar arterial oxygen gradient was lower in volume controlled ventilation applications after pneumoperitoneum. These findings indicate that volume controlled ventilation is able to provide better alveolar ventilation than pressure controlled ventilation in laparoscopic choleycystectomy surgery.

References

1 Marco AP, Yeo JC, Rock P. Anesthesia for a patient undergoing laparoscopic cholecystectomy. *Anaesthesiology* 1990; **73**: 1268–70.

Paper No: 1180.0

The incidence of heparin resistance, andtreatment strategies in patients undergoing open heart surgery: A retrospective study

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Introduction: Heparin resistance (HR) is characterized by high doses of unfractionated heparin (UFH) being required to bring activated partial thromboplastin time (aPTT) and activated coagulation time (ACT) within therapeutically

desired ranges or by the impossibility of reaching these ranges. Anticoagulation is mandatory during cardiopulmonary bypass (CPB), and heparin is the most commonly used anticoagulant agent. Themost frequent cause of HR is deficiency of antithrombin (AT), the presence of which is essentialfor UFH to exert its anticoagulatory effect.

Objective: The aim of our study is, to identify the incidence of heparin resistance in our patients and treatment strategies of our clinic retrospectively.

Methods: 1101 consecutive open heart surgery patients wereevaluated using their medical records and anesthetic charts. Patients receiving preoperative heparin, streptokinase, and oral contraceptives, and patients with coagulation disorders were not included into the study. Demographic data, activated coagulation time (ACT) levels, administration of additional heparin dose, and freshfrozen plasma, and AT-III treatments were recorded. Statistical analyses was performed with Frequency tables and median calculation in all categories.

Results: Of the 1101 patients, 409 patients (37%) received additionalheparin once (n=305) or twice (n=54). 49 patients (4.45%) within adequate ACT levels (<450 sec) after second additional heparin dose, received FFP and AT-III treatment was given to 2 patients (0.18%). Our results demonstrated that 37% of our patients needed higher doses of heparin with a 4.45, and 0.18% incidence of FFP and AT-III treatments respectively.

Conclusion: AT-dependent HR occurs in the cases of congenital AT deficiency, asparaginase therapy, disseminated intravascular coagulation (DIC) and administration of high doses of heparin during extracorporeal circulation, where it is significant, due to the need to maintain a very high ACT (> 400 s), that use of heart-lung machines is associated with an HR incidence of approximately 20%. In our patients HD problem was solved additional heparin doses, FFP transfusion and AT-III treatments in high percentages.

References

1 Maurin N. Heparin resistance and antithrombin deficiency. Med Klin (Munich). 2009 Jun 15;**104**(6): 441–9. Epub 2009 Jun 16. Review. German

2 Spiess BD. Treating heparin resistance with antithrombin and fresh frozen plasma. Ann Thorac Surg. 2008 Jun;**85**(6):2153–60. Review.

Paper No: 1184.0

Anaesthesia in a kabuki's syndrome patient: in reference to a clinical case

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Introduction: Kabuki's syndrome (SK) is a rare congenital anomaly of unknown case without specific treatment. It is characterised by a dysmorphic face, skeletal anomalies (mainly affecting spinal column and hips), dermatoglific changes, mental and post-natal growth retardation. Most medical problems can be solved surgically. Anaesthetic risk rises due to several factors: difficult airway (skull-face deformities); difficult ventilation (scoliosis, vertebral anomalies and atrophy of the muscles); cardiac (arrhythmia and structural deformities), neuromuscular (muscular dystrophy), hepatic, renal or SNC's anomalities. There are only a few case report in medical literature and therefore there isn't an specific anesthethic guideline. Clinical case: Female patient, 20 years old, submitted to total left hip arthroplasty due to a subluxation coxarthrosis. Past history of hypothyroidism and Kabuki's syndrome (since age of 4), left bundle branch block, hypoacusia, visual acuity decrease and blepharoptosis. As an infant it was bubmited to two surgical operations due to congenital bilateral hip dislocation. Medicated i ambulatory with levothyroxine (25 μg). Medical examination exposed: good mouth opening, Mallampati II, high and arched hard palate, retrognatia, macroglossia and short neck, without cervical mobility imparement. Skeletal deformities in hands and feet and toraco-lombar scoliosis were detected. Complementary diagnostic tools: normal thyroid gland function, chest x-ray and transthoracic echocardiogram without chages. Although no changes were found in the CBC, 2U of packed red cells (PCR) were requested for the perioperative period. After standard monitoring, neuromuscular blockade monitoring and BIS, general balanced anesthesia was set, with midazolam, fentanyl, propofol and atracurium. Unenventful intubation was achieve by videolaryngoscopy. Radial arterial line and two large bore peripheral veins were catheterised. Anaesthesia was maintained with oxygen and air (50:50), sevoflurano and atracurium. Estimated blood losse in the intraoperative was about 1L, with marked haemodynamic instability, requiring transfusion of 2U PRC and 2U FFP. Surgery lasted for 4 hours. At the end the patient was extubated without complications and transferred to Surgical Intensive Care Unit (SICU). The patient remained 24 hours in this SICU and then transferred to Orthopaedic Ward, from where she discharged after 10 days.

Discussion and Conclusions: The rarity of the disease and the lack of medical literature, neither grant to outline the anaesthetic risks associated to the chosen anaesthetic technique, nor predict which is the most recommended one. However, because of the known changes of this syndrome, a lot of risks can be suspected. The preanesthetic evaluation turned out to be of extraordinary importance and was the best way to anticipate and prevent potential complications.

Paper No: 1214.0

Perioperative management and results after transcatheter aortic valve implantation (TAVI). Single center experience from 2009-2011

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Introduction: Aortic stenosis is the most common valve disease in Europe. The standard treatment is aortic valve replacement by conventional surgical procedure. In patients with high perioperative risk or contraindications for open surgery TAVI has been developed. This technique reduces the surgical trauma allowing the replacement of the valve through a transfemoral or transapical approach.
Objective: The aim of this study is to assess cardiovascular and perioperative risk factors, intraoperative complications, intensive care unit length of stay (ICU-LOS) and hospital length of stay (H-LOS), early and late postoperative complications after TAVI.
Methods: Retrospective descriptive study. We included all patients who underwent TAVI performed by transfemoral and transapical approach with placement of both Edwards-Sapien® valve or Corevalve© in our center between 2009-2011. Collected data: Demographic data, preoperative risk factors, intraoperative and postoperative complications rate. The procedures were performed under general anesthesia and TEE was performed intraoperatively in all cases. The same anaesthetic protocol was used.
Results: 32 patients underwent TAVI. Mean age was 80.2+/ – 4.7 years. 37.5% of patients had an EuroSCORE> 20% and 37.5% had an Euroscore>30%. Cardiovascular risk factors: hypertension (78.1%), dyslipidemia (62.5%), dyspnea NYHA grade III (75%), ischemic heart disease (46.9%), diabetes mellitus (50%), atrial fibrillation (50%) were the most frequent cardiovascular risks factors. Edwads-Sapien ®valve was implanted in the 65% of patients. Transfemoral approach was performed in 75.8% of patients vs 24,6% for transapical. Intraoperative complications: 21.9% of patients needed external pacemaker due to AV block. Coming into cardiopulmonary bypass was required in 9.4% of patients due to valve migration and no patients died during surgery. Postoperative outcomes: Non invasive mechanical ventilation and prolonged intubation more than 24 hours was observed in 6.3% of patients, delirium in 21.9%, permanent pacemaker in 15.6% and cardiogenic shock in 12.5%. 6.1% of patients died in the following 30 days Mean ICU-LOS and H-LOS were 1.7+/ – 2.8 and 8 +/– 4.4 days.
Conclusion: TAVI procedure is a complex technique that allows intervention in patients with high surgical risk or contraindications for conventional surgery. This procedure requires management by a multidisciplinary team to select the appropriate patients and manage the potential complications that might require institute a cardiopulmonary bypass. Despite one single center experience, our preliminary results are similar to those described in the literature.

References

1 Anesthesia and Perioperative Management of Patients Undergoing Transcatheter Aortic Valve Implantation: Analysis of 90 consecutive patients with focus on perioperative complications. Journal of Cardiothoracic and vascular anesthesia, 2010
2 Trans-apical aortic valve implantation: univariate and multivariate analalyses of the early results from the SOURCE registry. European Journal Cardiothoraric Surgery(2010)

Paper No: 1230.0

The evaluation of genotoxic effects in pediatric surgery operating room personnel with micronucleus method

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Introduction: It is well known that healthcare workers in the operating room are exposed to genotoxic effects due to waste anesthetic gases in the operating room (1). The maximum levels of inhalation anesthetics are detected in ear nose throat and pediatric surgery theatres (2). In the practice of pediatric anesthesia, waste anesthetic gases occur more than the other type of anesthesia, due to the inhalational mask induction, laryngeal masks, uncuffed endotracheal tubes and opened breathing systems (3). Healthcare workers in the pediatric operating rooms encounter occupational exposure to waste anesthetic gases from these sources (4).
Objective: The aim of this study is to investigate the genotoxic effects due to occupational exposure of pediatric surgery operating room personnel by micronucleus method.
Methods: This study was performed in peadiatric hospitals in 30 operating room personnel (4 anesthesia specialist, 9 anesthesia technicians, 11 operating room nurses, 6 operating room worker) following Institutional Ethical Committee approval. In the same hospital age, gender, body mass index, alcohol and cigarette consumption matching 30 workers from other divisions of hospital were chosen as control group. All applicants were applied a survey about investigating situations increasing genotoxic effect and then buccal epithelial samples were collected. Microscopic evaluation was performed after staining for micronucleus method. Data were analysed with Student's t, Chi -Square, Mann-Whitney U, Fisher-extract, Kruskall-Wallis, Spearman's correlation analyses tests. Statistical significance was considered as $p<0.05$.

Results: In operating room group, micronucleus frequency was significantly increased compared to control group ($p<0.05$). In subjects younger than 35 years, micronucleus frequency was significantly increased compared to control group ($p=0.009$). The micronucleus frequency of anesthesia workers (doctors and technicians) were significantly higher than those of control group ($p=0.034$). In the non-smoking operating room group micronucleus incidence was higher than non-smoking control group ($p=0.007$). The incidence of micronucleus in groups were not correlated with gender, alcohol consumption, occupational exposure period and working conditions ($p>0.05$).

Conclusion: In this study, genotoxic effects were confirmed in pediatric surgery operating room personel especially in young ones and anesthesia workers. These results may be explained with waste anesthetic gases rather than patient's viral illness and the other differences between the groups. Because of this, total intravenous anesthesia, low flow anesthesia and regional anesthesia should be preferred for anesthesia practice.

References

1 Pasquini R, Scassellati-Sforzolini G, Fatigoni C, *et al.* Sister chromatid exchanges and micronuclei in lympocytes of operating room personnel occupationally exposed to enflurane and nitrous oxide. *J Environ Pathol Toxicol Oncol* 2001; **20**: 119–26.

2 Hoerauf K, Funk W, Harth M, Hobbhahn J. Occupational exposure to sevoflurane, halothane and nitrous oxide during paediatric anaesthesia. Waste gas exposure during pediatric anaesthesia. *Anaesthesia*1997; **52**: 215–9.

3 Gentili A, Accorsi A, Pigna A, Bachiocco V, Domenichini I, Baroncini S, Violante FS. Exposure of personnel to sevoflurane during paediatric anaesthesia: influence of professional role and anaesthetic procedure. *Eur J Anaesthesiol*. 2004; **21**: 638–45.

4 Chang WP, Lee S, Tu J, Hseu S. Increased micronucleus formation in nurses with occupational nitrous oxide exposure in operating theaters. *Environ Mol Mutagen*. 1996; **27**: 93–7.

Paper No: 1237.0

Use of midazolam for total intravenous anesthesia(tiva)in neurosurgery: preliminary clinical results

Introduction: Propofol is considered the ideal hypnotic drug for TIVA in neurosurgery(1) with low impact on CBF, ICP and metabolic autoregulation(2). Unfortunately Propofol is also associated with potentially cerebral harmful cardiovascular depressant effects (hypotension and bradycardia), respiratory depression and PRIS (Propofol Infusion Syndrome)(3). Midazolam, a short-acting benzodiazepine (BZD)(4) with low metabolic impact, hemodynamic stability(7,10) and recent evidences of neuroprotective effects9, is commonly used for sedation in ICU but not in neuroanesthesia, for lack of a validated pharmacokinetic model(5,6,8,11) to target its infusion and recovery time.

Objective: To evaluate the feasibility of a TIVA in TCI view midazolam/remifentanil anesthesia for resection of supratentorial cerebral tumors using a new anesthesia workstation (GE Healthcare Navigator® Application Suite) equipped with specific PK/PD model(11); moreover, we assessed the effects on heart rate (HR), blood pressure (BP) and Spectral Entropy (SE)(GE Healthcare M-Entropy module)(12) and their correlations with drugs effect site (Ce) and recovery times.

Methods: After informed consent and approval by Ethical Committee, patients, ASA I-III, aged 18-70 yr, scheduled for supratentorial expanding lesions craniotomy were enrolled in the study. All the patients, without any premedication, received Remifentanil/Midazolam Ce 7-10 ng/ml - 0.4-0.5 mcg/ml by TIVA in TCI view modality. Drug infusion, targeted to ensure a $SE<60$, was stopped after skin dressing. BP, HR, oxygen saturation (SaO2), SE and Ce of Midazolam and Remifentanil were recorded every 5 seconds (GE Healthcare Datex-Ohmeda S/5TM Data Collect) during the procedure and on specific events: induction (T0), intubation (T1), Mayfield pinning (T2), skin incision (T3), 180' from craniotomy (T4), drugs discontinuation (T5) and extubation (T6). Recovery times (from drugs discontinuation to extubation) were registered.

Results: We enrolled 11 patients (4 male, 63 ± 12 years). Average surgery time $229 \pm 102{,}25$ minutes. Recovery time was 13,83?7,61 minutes. Data registered are reported in FIGURE 1 and TABLE 1.

Conclusion: Data analysis shows T1 - T4 progressive reduction of entropy values coupled with the increase in Midazolam Ce; HR and BP didn't show meaningful variations, neither in more stressful periods (T1, T2, T3) with SE values <60. Recovery times result really outstanding, in consideration that one of the most unfavourable characteristics of Midazolam anesthesia is unpredictable recovery time. Despite the little sample, this study seems to indicate that Midazolam-Remifentanil TIVA when performed with PK/PD model(12) by Navigator® workstation coupled with Spectral Entropy ensures a good quality of anesthesia with hemodynamic stability and fast recovery.

References

1 Cottrell et al. Anesthesia for neurosurgery. Clinical anesthesia, 5th ed

2 Aalt et al. Effects of sevoflurane, propofol in regional CBF, oxygen consumption, and blood volume. Anesthesiology 2003 – 99:603

3 Cardone et al. propofol infusion syndrome. *Anaesthesia*, 2007, **62**: 690.

4 Kapp et al. midazolam and anaesthesia. Br. *J. clin. Pharmac.* (1983), **16**, p187S.

5 Shafer et al.. Population pharmacokinetics of midazolam administered by TCI for sedation following coronary artery bypass grafting. *Anesthesiology* 1998–89:1418.

6 Vletter et al. Quantification of the EEG effect of midazolam by analysis in volunteers: pharmacokinetic/pharmacodynamic modelling.

7 Miller et al. Optimizing sedation following major vascular surgery. *Can J Anaesth* 1994; **41**: 782–93
8 Greenblatt et al. Kinetics and EEG effects of midazolam during and after 1-minute, 1-hour, and 3-hour intravenous infusions. *J Clin Pharmacol* 2004; **44**: 605.
9 Kass et al. Effects of midazolam on brain injury after transient focal cerebral ischemia in rats. *J Neurosurg Anesthesiol*, 2009 Apr;**21**(2): 131.
10 Coriat et al. Infusion of propofol, sufentanil, or midazolam for sedation after aortic surgery. *Anesth Analg* 1998; **87**: 272.
11 Albrecht et al. The effect of age on the pharmacokinetic and pharmacodynamic of midazolam. *Clin Pharmacol Ther*. 1999 Jun;**65**(6): 630.
12 Martorano, Pelaia Bispectral index and entropy in neuroanesthesia. J Neurosurg Anesthesiol. 2007 Jan;**19(1)**:65.

Paper No: 1238.0

Use of midazolam for total intravenous anesthesia(tiva)in neurosurgery: preliminary clinical results

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Introduction: Propofol is considered the ideal hypnotic drug for TIVA in neurosurgery(1) with low impact on CBF, ICP and metabolic autoregulation(2). Unfortunately Propofol is also associated with potentially cerebral harmful cardiovascular depressant effects (hypotension and bradycardia), respiratory depression and PRIS (Propofol Infusion Syndrome)(3). Midazolam, a short-acting benzodiazepine (BZD)(4) with low metabolic impact, hemodynamic stability(7,10) and recent evidences of neuroprotective effects9, is commonly used for sedation in ICU but not in neuroanesthesia, for lack of a validated pharmacokinetic model(5,6,8,11) to target its infusion and recovery time.
Objective: To evaluate the feasibility of a TIVA in TCI view midazolam/remifentanil anesthesia for resection of supratentorial cerebral tumors using a new anesthesia workstation (GE Healthcare Navigator® Application Suite) equipped with specific PK/PD model(11); moreover, we assessed the effects on heart rate (HR), blood pressure (BP) and Spectral Entropy (SE)(GE Healthcare M-Entropy module)(12) and their correlations with drugs effect site (Ce) and recovery times.
Methods: After informed consent and approval by Ethical Committee, patients, ASA I-III, aged 18-70 yr, scheduled for supratentorial expanding lesions craniotomy were enrolled in the study. All the patients, without any premedication, received Remifentanil/Midazolam Ce 7-10 ng/ml - 0.4-0.5 mcg/ml by TIVA in TCI view modality. Drug infusion, targeted to ensure a SE$<$60, was stopped after skin dressing. BP, HR, oxygen saturation (SaO2), SE and Ce of Midazolam and Remifentanil were recorded every 5 seconds (GE Healthcare Datex-Ohmeda S/5TM Data Collect) during the procedure and on specific events: induction (T0), intubation (T1), Mayfield pinning (T2), skin incision (T3), 180' from craniotomy (T4), drugs discontinuation (T5) and extubation (T6). Recovery times (from drugs discontinuation to extubation) were registered.
Results: We enrolled 11 patients (4 male, 63 $\pm$ 12 years). Average surgery time 229 $\pm$ 102,25 minutes. Recovery time was 13,83?7,61 minutes. Data registered are reported in FIGURE 1 and TABLE 1.
Conclusion: Data analysis shows T1 - T4 progressive reduction of entropy values coupled with the increase in Midazolam Ce; HR and BP didn't show meaningful variations, neither in more stressful periods (T1, T2, T3) with SE values$<$60. Recovery times result really outstanding, in consideration that one of the most unfavourable characteristics of Midazolam anesthesia is unpredictable recovery time. Despite the little sample, this study seems to indicate that Midazolam-Remifentanil TIVA when performed with PK/PD model(12) by Navigator® workstation coupled with Spectral Entropy ensures a good quality of anesthesia with hemodynamic stability and fast recovery.

References

1 Cottrell et al. Anesthesia for neurosurgery. Clinical anesthesia, 5th ed
2 Aalt et al. Effects of sevoflurane, propofol in regional CBF, oxygen consumption, and blood volume. *Anesthesiology* 2003; **99**: 603
3 Cardone et al. propofol infusion syndrome. *Anaesthesia*, 2007, **62**: 690.
4 Kapp et al. midazolam and anaesthesia. *Br. J. clin. Pharmac.* (1983), **16**, p187S.
5 Shafer et al.. Population pharmacokinetics of midazolam administered by TCI for sedation following coronary artery bypass grafting. *Anesthesiology* 1998–89:1418.
6 Vletter et al. Quantification of the EEG effect of midazolam by analysis in volunteers: pharmacokinetic/pharmacodynamic modelling.
7 Miller et al. Optimizing sedation following major vascular surgery. *Can J Anaesth* 1994; **41**: 782–93
8 Greenblatt et al. Kinetics and EEG effects of midazolam during and after 1-minute, 1-hour, and 3-hour intravenous infusions. *J Clin Pharmacol* 2004; **44**: 605.
9 Kass et al. Effects of midazolam on brain injury after transient focal cerebral ischemia in rats. *J Neurosurg Anesthesiol*, 2009 Apr;**21**(2): 131.
10 Coriat et al. Infusion of propofol, sufentanil, or midazolam for sedation after aortic surgery. *Anesth Analg* 1998; **87**: 272.
11 Albrecht et al. The effect of age on the pharmacokinetic and pharmacodynamic of midazolam. *Clin Pharmacol Ther*. 1999 Jun;**65**(6): 630.
12 Martorano, Pelaia Bispectral index and entropy in neuroanesthesia. *J Neurosurg Anesthesiol*. 2007 Jan;**19**(1): 65.

Paper No: 1240.0

Preoperative testing exams before ambulatory surgery : surgeons behavior impact

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Introduction: The prescription of preoperative testing exam should be guided by patient medical history, the clinical exam and the type of surgery and anesthesia. The surgeons are the first to be in contact with the patients and they often order a battery of tests on each patient to prevent delays or cancellations 1. The costs of preoperative testing are substantial. In the United States this is estimated at more than $18 billion. 2. The elimination of unnecessary tests can reduce costs and resource utilization. The guidelines may help surgeons to avoid unnecessary testing in ambulatory surgery.3
Objective: Our aim was to study the respect of guidelines by physicians when ordering preoperative tests and the economic impact of unnecessary tests.
Methods: We have conduct a prospective descriptive study from April to June 2010 including patients aged more than 3 years, ASA I or II, scheduled for ambulatory surgery we have assessed the demographic data, type of surgery and preoperative tests and their costs. A preoperative test was defined as unnecessary when it wasn't recommended by guidelines and the patient didn't have clinical abnormalities. A simple memorandum of guidelines was distributed to surgeons. Statistical analysis: Chi-square test; student test, $p<.05$, SPSS 13.0
Results: 520 patients were screened in this study (ASA 1=65, 2%; ASA 2=34, 8%) the age average was 48 ± 12 years. In 95% of cases the preoperative tests were ordered by surgeons. The guidelines weren't respected in 32.8% of prescription. The prescription of only indicated tests could save 4280 TD per month to our hospital. Table: Assessment of unnecessary tests and their costs. percent age cost.

RX thorax	8,7%	1282 DT
ECG	5,2%	345 DT
NFS	6,2%	720 DT
TP	4,1%	248 DT
TCA	2,1%	120 DT
Ionogramme	7,2%	515 DT
Créât	10,2%	620 DT
Urée	6,8%	120 DT
GS	4,6%	70 DT
Glycémie	20,2%	240 DT

Conclusion: Respect of guidelines, collaboration between anesthesiologists and surgeons and clinical evaluation of patients improve the preoperative evaluation for ambulatory surgery and reduce costs and resource utilization.

References

1 Roizen MF. Preoperative evaluation. In: Miller RD (ed): Anesthesia,3 ed. New York: Churchill Livingstone, 1990:743-72.
2 Roizen MF. More preoperative assessment by physicians andless by laboratory tests. N Engl J Med 2000;342:204.
3 Mancuso CA. Impact of new guidelines on physicians' ordering of preoperative tests. J Gen Intern Med 1999; 14:166 ± 172.

Paper No: 1243.0

Retrograde intubation – old existing skill in certain scenarios- clinical case report

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Introduction: The case involves the surgical resolution on duty of a severe injury of the facial skeleton and points out the challenge that implies not having the ideal equipment, such as a fibrolaringoscope, for non-conventional approach of the airway; techniques such as the retrograde intubation represent a solution in the decision making.
Objective: Present, through the description of a clinical case, the technique of Retrograde Intubation to make the anesthesiologist remember how to proceed in emergency rooms, where the resources are scarce.
Method and Material: The case of a male patient of 28 years old, lucid and hemodynamically compensated is presented. He arrives at the emergency room with a stab wound, which remains inlaid right in the facial skeleton, with compromised upper jaw, considerable edema and perilesional injury; which prevents the mouth opening for direct laryngoscopy. Due to difficulties in the handling of the airway by clinic and 3D tomography, a retrograde intubation is performed and explained to the patient. We start analgosedation with 0.04 mg/kg of midazolam and 1 mcg/kg IV of fentanyl; the fauses are sprayed with lidocaine spray 100%. Previous asepsis according to technique, the cricoid cartilage is manually located, and below it, we infiltrate by levels of 60-80 ml of lidocaine 2% until reaching tracheal light, confirmed through bubbling by aspiration. In the dermal wheal, up to the cricothyroide membrane, a syringe is attached with 4ml of physiologic solution to a Tuohy needle (TN), performing the puncture with simultaneous aspiration to re-confirm the permanence inside the airway. An epidural catheter is introduced in cephalic sense rescuing it from the mouth with Magill clamp. The TN is removed and the catheter is fixed with a Kocher clamp. The endotracheal tubés light is slid through the catheter and once intubated, the catheter

is removed by the cephalic end and the introduction of the tube is concluded.
Results: Despite the unavailability of techniques for difficult intubation like fibrolaryngoscopy, we achieved a successful retrograde intubation, and surgery was performed normally.
Conclusion: The importance of this procedure is emphasized as an alternative technique in the urgency, before the impossibility of performing an endotracheal intubation with conventional methods (for anatomical, clinical, pathological complications, with patient in spontaneous ventilation), or before the lack of access to fibrolaryngoscopy. It is an easy procedure to learn; it does not require special equipment and can be applied in emergency rooms where the resources are scarce.

Paper No: 1244.0

Palatopharyngeal perforation during glidescope® intubation

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Introduction: The GlideScope® video laryngoscope is a useful tool that facilitates difficult tracheal intubations. The estimated complications is of 1% for minor soft tissue injuries, and 0,3% for major complications. 1 We report a case of palatopharyngeal wall perforation during intubation with a GlideScope®. CLINICAL CASE: 41 year old woman, proposed for bariatric surgery, ASA III (IMC: 51) with difficult airway predictors: small mouth, Mallampati 4, hypertrophy of the tonsils and short-sized neck. After the induction, the GlideScope® was used for orotracheal intubation, having had difficulties with the insertion and positioning of the blade. In view of the vocal chords, we observed a Cormack-Lehane 2-3. The insertion of the endotracheal tube (ETT), with conductor, was extremely difficult due to the small available area within the oral cavity, having had the necessity to perform several tube rotation maneuvers until it was visible on screen, however without difficulty when passing the ETT through the vocal chords. During surgery, blood was found in the oropharynx, so in the end of the surgery a direct laryngoscopy was performed, which revealed that the ETT had crossed through the right anterior tonsillar pillar. The emergency Otolaryngology was contacted and performed the corrective surgery and haemostasis. The awakening and postoperative went with no complications.
Discussion: A review based on a Medline revealed 11 other case reports describing such an injury. It should be noted that all eleven patients sustained trauma during the insertion of the ETT rather than during the GlideScope® laryngoscopy itself. There are several common reasons for this: The ETT tip had been inserted laterally into the mouth and the tube was rotated previously to bringing the tip within view, thus increasing the risk of tissue perforation; an upward lifting force on the mandible and anterior pharyngeal tissue caused for the blade to stretch the tonsillar pillars, making them taut and more susceptible to perforation; tendency for the operator to watch the monitor attentively after insertion of the blade, allowing a "blindspot" during insertion where the ETT tip is not observed, which may result in incorrect ETT advancement; the standard stylet may itself cause trauma in oral structures, especially if unnecessary force is used. 2
Conclusion: Intubation using the GlideScope® has advantages over conventional direct laryngoscopy, and its use should not be discouraged by the case reports presented. Instead, with better training and adequate patient selection, the relapse of this type of complication can and will diminish.

References

1 Anesthesiology 2011, 114: 34-41
2 Anaesth Intensive Care 2008; 36: 870-874

Paper No: 1251.0

Intra-operative effect of exogenous heparin and endogenous heparin-like substances in liver transplant patients : A Reality or Myth?

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Introduction: Altered coagulation is extremely common in liver transplant patients; particularly in the post reperfusion phase. Exogenously administered heparin to the donor liver 1 and endogenously produced heparin-like substances which are released from the damaged vascular endothelium of the ischaemic liver graft 2 have been thought to contribute to this. There have been studies that showed such patients requiring protamine sulphate to reverse this effect in order to control oozing and improve the thromboelastograph profile 3.
Objective: We performed this study in order to ascertain the difference in coagulation profiles using thromboelastography (TEG) caused by heparin and heparin-like substances in the reperfusion phase for patients undergoing liver transplant.
Methods: All patients undergoing liver transplantation except for patients in fulminant liver failure were included. Initial data collected included demographic data, indication for liver transplant, Child Pugh score and MELD score. Baseline traces were taken using a normal kaolin TEG sample and a heparinase TEG sample. Following reperfusion the same process was repeated again with kaolin TEG and heparinise TEG at 10(r+10) and 60 minutes post reperfusion(r+60). Along with the TEG traces performed the INR and platelet count was measured too. A total of 30

patients were included in the data so far. The transfusion of blood and blood products was noted at all stages pre and post transfusion. It was decided to give protamine 1mg/kg in case of heparin effect demonstrated on TEG at r+60 accompanied by non surgical bleeding. Following the protamine injection a repeat TEG was performed at a fifteen minute interval and the surgeon was asked for their opinion regarding the non surgical bleeding.

Results: The TEG traces at baseline, r+10 and r+60 were analysed and it was observed that the r+10 trace was better in 28 of the 30 traces for the heparinase group. 7 of the 30 normal TEG traces were flatlines indicating no clot formation at the ten minute stage post reperfusion. However at the 60 minute mark post reperfusion it was observed that the normal TEG traces improved significantly. The average values for the parameters are tabulated. Normal TEG Heparinase TEG Reaction time(r) 12.63 14.17 Coagulation time(r+k) 5.44 3.92 Maximum amplitude (MA) 48.83 53.77 Clot formation rate (á) 40.82 50.75 There was no statistically significant difference between the normal and the heparinase TEG groups and just one of the 30 cases required protamine injection for reversal of non surgical bleeding effect.

Conclusion: We conclude that although there is a demonstrable heparin and heparin like substance effect immediately post reperfusion it is short lived and is auto corrected by 60 minutes without any pharmacological reversal.

References

1 Hickman R, Bracher J, Pienaar B *et al.* Heparin as the cause of coagulopathy which may complicate grafting of the liver. *Surgery, Gynaecology and Obstetrics* 1991; **172**: 197–206.

2 Bakker CM, Stibbe J, Gomes MJ *et al.* The appearance of donor heparin in the recipient after reperfusion of a liver graft. *Transplantation* 1993; **56**: 327–329.

3 Harding SA, Mallett SV, Peachey TD *et al.* Use of heparinise modified thromboelastography in liver transplantation. *British Journal of Anaesthesia* 1997; **78**: 175–179.

Paper No: 1255.0

Assessment of risk for burnout syndrome in residents of a private hospital in São Paulo

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Introduction: Burnout is a kind of occupational stress, during which the person consumes each other physically and emotionally, resulting in exhaustion and aggressive and irritable behavior. To diagnose the syndrome an extensive questionnaire was developed by Maslach in the 90s, with 20 questions on the psychophysical characteristics of the job divided in three aspects: emotional exhaustion, depersonalization and low professional accomplishment. Responses were scored gradually from 1 to 5 according to the frequency of symptoms. Sum up the points and the proposed ranks are: 0 to 20: no clue, 21-40: opportunity to develop, 41 to 60: the initial phase, 61 to 80: installed 91 to 100: state of alert.

Methodology: After release of the ethics committee, we applied a questionnaire to characterize demographically the respondents, followed by a self-completed 20 questions questionnaire. The questionnaire was applied to residents of a private tertiary hospital. The residency programs in this hospital are: anesthesiology, cardiology, endoscopy, mastology, intensive medicine, radiology and radiotherapy. All residents share the work environment, workload and social characteristics of the hospital.

Results: Forty two residents answered the questionnaire, half female and half male. Nine percent of the residents achieved a high score (61 to 80 points), 69% achieved 41 to 60 points, 21% achieved 21 to 40 points and none had less than 20 points. There was no statistical difference between age, marital status, presence of children, performing night and weekend shifts, only with different distribution of the duty hours, respecting 60 weekly hours.

Discussion: Although not statistically significant, a trend to higher risk of burnout can be noticed in some medical specialties. There is no validated questionnaire to evaluate burnout in medical residents. In order to promote better conditions of learning and working in residency, its necessary to identify the risks of this special population. As the residents very often complain about stress and hard work we tried to detect through an preliminary questionnaire. This is a preliminary study and despite the absence of statistical differences in burnout incidence between different specialties, anesthesia has a major concern because many risk factors and the potential to drug abuse.

References

1 Shanafelt T. Burnout in Anesthesiology: *A Call to Action Anesthesiology*. **114**(1): 1–2, 2011.

2 Gil-Monte PR. Validação fatorial de Maslach Burnout Inventory (MBI-HSS) para profissionais espanhóis Rev. *Saúde Pública* 2005; **39**(1): 1–8.

Paper No: 1265.0

Who do they think we are? patient perception of anaesthetists and how we introduce ourselves

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Objectives: To determine if the way we introduce ourselves at pre-operative assessment affects patient perception of anaesthetists.

Methods: A questionnaire was conducted of 48 surgical inpatients who had recently had surgery across all surgical subspecialties and 22 anaesthetists of differing seniority.

Results: 29% (14/48) patients did not understand the role of the "anaesthetist" and found the term foreign or ambiguous. 71% (34/48) of patients understood the role of the anaesthetist but 62% of these patients did not know that anaesthetists are qualified doctors. They believed anaesthetists were either nurses, technicians or surgical assistants. Of the 14 who did not know what an anaesthetist was, 6 patients understood the role of an "anaesthesiologist" and believed them to be highly specialised qualified doctors. Only 1 out of the 14 patients was aged 55yrs old, the remaining 13 patients were aged between 18 and 22 yrs old. Of the patients who did not know anaesthetists are fully qualified doctors 48% were 20 to 28yrs old, 29% were 32 to 49yrs old and 23% were 50 to 55yrs old. All the patients aged 75 to 90yrs old believed anaesthetists to be fully qualified doctors. All the consultants questioned introduced themselves by their title, surname and as an anaesthetist. The majority of junior doctors introduced themselves by their first name and either as the anaesthetic doctor, anaesthetic registrar or the anaesthetist. 47/48 patients believed anaesthetists should introduce themselves as anaesthetic doctors although they did feel more comfortable being on first name basis with their anaesthetists. Of the 14 patients who did not understand the role of the anaesthetist, 10 believed they would understand this better if their anaesthetist introduced themselves as anaesthetic doctors rather than anaesthetists.
Discussion: Although the majority of the patients who had recently had an anaesthetic understood the role of their anaesthetist there is a large proportion who did not appreciate the role of the anaesthetist in their care. The majority of patients did not know that anaesthetists are qualified doctors. The way anaesthetist introduces themselves to a patient influences their opinion of the role of an anaesthetist and creates less ambiguity. Further education of younger patients may address the lack of knowledge amongst younger patients.

Paper No: 1269.0

In-hospital mortality prediction by american society of anesthesiology and POSSUM score in patients with cancer undergoing abdominal surgery

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Introduction: Preoperative evaluation and risk stratification is essential to perioperative planning. There are multiple risk scores applied to predict different outcomes. However, specific populations as patients with cancer may have specific risk factors, so it is needed to evaluate if global risk scores as ASA and POSSUM or P POSSUM are able to assist the surgical team.
Objective: To retrospectively assess the value of the ASA classification (American Society of Anesthesiology), POSSUM (Physiological and Operative Severity Score for the Enumeration of Mortality and Morbidity), and Porthsmouth POSSUM in prediction of hospital mortality in patients with cancer undergoing abdominal surgery.
Methods: Three hundred and thirteen patients who underwent three hundred and nineteen oncologic abdominal surgeries were evaluated using ASA, POSSUM and Porthsmouth-POSSUM in relation to hospital mortality. The variables observed were: age, gender, ASA classification, pulmonary diseases, cardiovascular diseases, preoperative systolic arterial pressure and cardiac rate, Glasgow scale, urea, potassium, sodium, hemoglobin, white cell count, number of simultaneous surgical procedures, observed blood losses, peritoneal contamination, oncological disease and dissemination, elective, emergent or urgent surgery, intensive care support and hospital mortality.
Results: The overall hospital mortality rate was 5.59%. These results showed that POSSUM over predicted in-hospital deaths when compared to American Society of Anesthesiologists classification (relative risk, 0.55; P=.07) and Porthsmouth POSSUM (relative risk, 0,43; P=.0007) didńt equally correspond to ASA predicted perioperative mortality. All evaluated scores didńt equally predict observed mortality as the standardized mortality rate was 2.25 for ASA classification, 0.4 for POSSUM and 0.8 for P-POSSUM.
Conclusion: The ASA classification, POSSUM and P POSSUM scores were not useful in predicting perioperative mortality for patients with cancer submitted to abdominal surgeries. It is needed to evaluate specific populations to adjust the existing perioperative prediction scores to serve as objective methods to assist the surgical team in classifying patients into risk groups with different probabilities of perioperative complications. ASA classification is based mainly on subjective clinical judgments and probably POSUUM and P-POSSUM need to have the equations balanced to specific populations.

References

1 Saklad M. Grading of patients for surgical procedures. *Anesthesiology*. 1941; **2**: 281–285.
2 Copeland GP, Jones D, Walters M. POSSUM: a scoring system for surgical audit. *Br J Surg*. 1991; **78**: 355–360.

Paper No: 1275.0

Thoracic paravertebral block (PVB) and thoracic epidural (TE): analysis of pos operatory pain after thoracotomy

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Introduction: Thoracotomy is associated with severe post operatory pain (1). Regional analgesia has a relevant role and TE is commonly refered as the "gold standard" (2), recent works point PVB as safer and as efficient as TE (3).
Objective: Analyse the analgesic profile of PVB versus ET after thoracotomy in the 48 hours after surgery in our institution.
Methods: Data were collected from the acute pain service data base, of the anesthesia Departement of Instituto Português de Oncologia, Porto, Portugal. 264 patients submitted to posterolatteral thoracotomy due to neoplastic aetiology and submitted to PVB or TE between 2005 and 2010 were enrolled in this study. 14 patients were excluded: high pain score implied suspention of the study protocol and new/ diferent analgesic therapy, accidental exteriorization, motor blockade, Neurologic, haemodynamic instability. A total of 250 patients were enroled in this study Statistical analysis was performed using SPSS Protocol: Pain evaluation was performed using a qualitative scale: 0 no pain, 1light, 3 moderate, 4severe, 5 unbearable pain. Analgesic technique Prior to incision:Paracoxibe 40 mg PVB (level:T4-T7, correct positioning of the PVB catheter was performed intraoperatory by the surgeon) TE (level:T4-T6) Before the end of the surgery Paracetamol 1g Nerve blockade PVB: Ropivacain 0,5%+ sufentanil TE:Ropivacaína 0,2%+sufentanil In the surgical ward: Paracoxibe 40 mg 12/12h, Paracetamol 1g 6/6h PVB: Ropivacain 0,2% or 0,3%+Sufentanil debit 5-12 ml/h TE: Ropivacain 0,1%+Sufentanil debit 5-12 ml/h Rescue analgesia: If pain ?2: 8ml ropivacaína 0,2%, lidocaín, morfin, petidin, ketamin.
Results: There were no statatistical differences between groups regarding age. Continuous PVB had an overall inferior quality of analgesia. There was statistical significant difference between grups at 0min, 45 min,1h and 2 h (Chi-square test $p<0.05$). After the secound postoperative hour there were no significant differences.
Discussion: Data analysis presents TE as the most effective analgesic method in the first 2 hours post surgery. PVB presents as an alternative method for analgesia when TE is infeasible for patient-related techniques.
Conclusion: Prospective studies need to be addressed with a larger number of subjects and homogeneity design to compare the efficacy of the analgesic techniques and determine risks and benefits.

References

1 European journal of cardio-thoracic Surgery 37(2010) 467-472
2 Anesthesia&Analgesia, vol107, No.3, September2008
3 Scandinavian Journal of Pain 1 (2010) 12-23

Paper No: 1279.0

Does the time of anesthesia can cause alteration of the serum cortisol level in cardiac surgery?

Introduction: The existence of a circadian rhythmicity of cortisol serum level and secretion by surgical trauma and stress is well known. Due to the constructions of our cardiovascular surgery operating rooms between October to December 2010, our staffs worked shift system and elective operations performed at different times of the day.
Objective: In this study we aimed to compare patterns of intra- and postoperative cortisol responses in patients undergoing surgery at different times of the day.
Methods: Fifty four consecutive open heart surgery patients were prospectively enrolled to the study after approval was obtained from the Ethics Board of our hospital. The patients were divided in to three groups according to hours of the anesthesia. Group 1 (n:18) was constituted of morning patients (08:00-09:00), group 2 (n:13) was noon patients (11:00-13:00) and group 3 (n:17) was evening patients (16:00-19:00). Blood sample were obtained just before anesthesia induction, end of the surgery and postoperative 24th hour for serum cortisol levels measurement. Cortisol levels were measured by ELISA technique. Postoperative extubation time, core body temperature, urine output, and the length of ICU and hospital stay were recorded.
Results: The demographic data, CPB and cross clamping times were similar in the groups. There was no statistically significant differences of the postoperative body core temperature, extubation times, the length of ICU and hospital stay between the groups. In all groups, cortisol levels increased significantly compared to baseline values at the end of surgery and was started to decline at the postoperative 24th hour. There was no significant difference in cortisol levels at any measurement times between the groups. The urine output amount was significantly lower in Group 3 compare to the other groups (p:0.000).
Conclusion: Our findings show that anesthesia starting time has no effects of on cortisol secretion.

Reference

1 Gögenur ?, Ocak U, Altunp?nar, et al. Disturbances in melatonin, cortisol and core body temperature rhythms after major surgery. *World J Surg* 2007; **31**: 290–8.

Paper No: 1282.0

Effects of intravenous lidocaine on postoperative pain control and opioid consumption

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Introduction: Recently intavenous infusion of lidocaine was introduced as part of a perioperative pain management technique (1,2). Lidocaine has been described as having analgesic, anti-hyperalgesic and anti-inflammatory properties (1-3). However its clinical benefit remains unclear (2).
Objective: Evaluate how peri-operative intravenous lidocaine influence post-operative pain and morphine consumption after surgical injury and study possible side effects, such as sedation, nausea or vomiting, acute urine retention or local anesthetic toxicity.
Methods: A prospective, randomized and double-blind study of twenty three female patients scheduled for transabdominal hysterectomy was undertaken. Patients were randomly divided in two groups: The first group (n=13) received lidocaine 2% bolus injection (1.5mg/kg) followed by a continuous i/v infusion at 1.5 mg/kg/h. The infusion was stopped once skin closure was finished. The control group (n=10) received matched saline infusion. Both groups received the same general anesthesia protocol avoiding the use dexamethasone and no more than 1 mcg/kg of fentanyl per hour. 30 minutes before the end of surgery 0,1 mg/kg of morphine and Ketoprofeno 1-2 mg/kg was administrated. Pain was evaluated using Verbal Numerical Scale every 15 minutes until PCA pump was started (VNS<4) and 24hs postsurgery, Sedation Ramsey scale was assessed every 15 minutes and secondary effects were evaluated .
Results: No patients were excluded during the study. Both group were comparable with regard to age, weight and length of surgery Patients in the lidocaine group experienced less postoperative pain at the time of been admitted at the postanesthesia care unit (VNE $4,6 \pm 4,1$ versus $8,5 \pm 2,0$), in the first 30 minutes ($4,5 \pm 2,3$ versus $6,5 \pm 1,1$) and 24hs after surgery ($2,8 \pm 1,7$ versus $4,8 \pm 2,1$). Patients who received lidocaine evidenced less morphine consumption previous PCA pump was started ($5,1 \pm 3,6$ versus $9,6 \pm 2,5$mg). The amount of Morphine administered by de PCA during the first 24hs was smaller in the lidocaine group ($15,9 \pm 9,9$ versus $20 \pm 9,5$mg), as well as the total morphine consumption in the first 24hs ($21,8 \pm 12,2$ versus $30,6 \pm 9,3$). The time that took to have the conditions to start PCA pump was less in the lidocaine group ($62,3 \pm 25$ versus $105 \pm 53,7$ minutes). Nausea or Vomiting incidence was similar in both groups. No other side effects were noted.
Conclusion: We found that patients who received i/v lidocaine experienced better pain relief and reduced postoperatory morphine consumption. This findings were more relevant clinical in the early post-operatory period.

References

1 Yardeni I, Beilin B, Mayburd E, Levinson Y, Bessler H. The Effect of Perioperative Intravenous Lidocaine on Postoperative Pain and Immune Function. Anesth Analg. 2009 Nov: **109(5)**:1464–1469
2 Vigneault L, Turgeon AF, Côté D, Lauzier F, Zarychanski R, Moore L et al. Perioperative intravenous lidocaine infusion for postoperative pain control: a meta-analysis of randomized controlled trials. Can J Anaesth. 2011 Jan; **58(1)**:22–37
3 Koppert W, Weigand M, Neumann F, Sittl R, Schuettler J, Schmeltz M, et al. Perioperative Intravenous Lidocaine Has Preventive Effects on Postoperative Pain and Marphine Consumption After Major Abdominal Surgery. Anesth Analg 2004; **98**: 1050–1055

Paper No: 1291.0

Physiological influence of basic perturbations assessed by non-invasive optical techniques in humans Authors

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Background: New non-invasive techniques enabling frequent or continuous assess-ments of various pathophysiological conditions might be used to improve in-hospital outcome by enabling earlier and more reliable bedside detection of medical deterioration in general hospital ward patients.
Methods: In thispreclinical study, three modern non-invasive optical techniques - laser Doppler imaging (LDI), near-infrared spectroscopy (NIRS), and tissue viability imaging (TVI) - were all evaluated with respect to the influence of basic physiological perturbations (including local changes in arm positioning, skin temperature and regional blood flow conditions) on quasi-simultaneously obtained values of skin perfusion, muscle tissue oxygenation (StO2) and skin blood volume in eighteen healthy volunteers.
Results: Skin perfusion measured by LDI was found to respond prominently to changes in positioning of the arm, whereas muscle StO2 measured by NIRS did not change significantly. Total haemoglobin count (HbT) measured by NIRS and blood volume estimated by TVI both increased significantly on lowering of the limb. On local cooling the perfusion and blood volume were both found to increase considerably, while StO2 and HbT did not change. Local heating induced a more than ten-fold increase in skin perfusion and a small increase in blood volume. On progressive veno-arterial occlusion the perfusion, StO2, HbT, and blood volume values decreased - after transient increases in HbT and blood volume before full arterial occlusion had been attained - all values approached the baseline level on release of the occlusion with a slight overshoot of the StO2.

Conclusion: The results obtained may have potential bearing on future clinical use of these non-invasive techniques for management of severely injured or critically ill patients.

Paper No: 1294.0

Opium Tincture for facilitating postoperative analgesia after coronary artery bypass graft in opium addicted patients

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Objective: In this prospective, randomized, double -blind study, we examined the efficacy of optinic tincture for pain management in opium -addicted patients after coronary artery bypass grafting (CABG) surgery.
Materials and methods: Sevety five opium addicted patients scheduled for elective coronary artery bypass grafting (CABG) surgery with EF>40% and less than 75 years old were recruited. Anesthesia management, cardiopulmonary bypass management,operative plans,and the dose and type of narcotic used were the same in the 3 groups. After anesthesia and operation and during the crtical care period any need to analgesic was provided by a 10 mg bolus of morphine along with nasogastrically injection of one of the three solutions: placebo,usual opium or opium tincture all dissolved in tea to a total 10 ml volume to the placebo,opium or tincture groups respectively. Total need of analgesic and the NG solutions were considerd. Visual analogue scale (VAS) and NRS(numeric rating scale) were used to asses the level of pain and the total satisfaction with the pain management protocol.
Results: Demographic data showed no significant difference in age, body mass index (BMI), preoperative hemoglobin, ejection fraction (EF) and number of grafts between the two groups and the prevalence of cardiovascular risk factors. Systolic pressure before extubation was 142.17 ± 14.13, 124.25 ± 9.55 and 118.72 ± 9.15 in the placebo,opium and tincture groups respectively(p value<0.05), although other hemodynamic variables were comparable between the three groups. Morphine and solution consumption differed significantly between three groups (p value<0.01), more in the placebo in comparison to the other two groups. The pain control management were significantly more satisfactory in the Tincture group(p value$=0.01$) with NRS value 4.96 ± 1.23in the placebo group, 8.50 ± 0.88 in the opium group and 9.52 ± 0.65 in the yincture group. During the study, analgesia was tolerated and no analgesia-related complications were experienced.
Conclusion: We conclude that both usual opium and optinic tincture provide effective analgesia after CABG operation in opium addicts. Morphine alone is a less effective analgesic in these patients. Tincture provided better satisfaction regarding the analgesic plan

Paper No: 1295.0

Opium addiction and the perioperative needs to inotropic agent in CABG patients

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Objective: To compare the opium dependent and nondependent patients regarding the need to inotropic agents during periods of weaning from cardiopulmonary bypass and the first postoperative day, after coronary artery bypass grafting (CABG) surgery.
Methods and material: Using (DSM-IV-TR) criteria, 237 patiets candidate of elective on pump CABG were screened and 62 male patients 25-75 yrs of age, with an ejection fraction>40% were enrolled. Cardiovascular risk factors were noted. Anesthesia management, cardiopulmonary bypass management, operative plans, the dose and type of narcotic used and the criteria for initiation and continuation of inotropes were the same in all patients. During anesthesia and 24 hours after the end of the operation, blood pressure (BP), heart rate (HR), enteral venous pressure (CVP), cardiac output (CO), systemic vascular resistance (SVR), and the need and duration of need to inotropes needed, were monitored and recorded. Paired sample t-test, Independent sample t-test and Chi-Square test were used to compare variables between the groups.
Results: Demographic data showed no significant difference in age, body mass index (BMI), preoperative hemoglobin, ejection fraction (EF) and number of grafts between the two groups and the prevalence of cardiovascular risk factors. Hemodynamic variables were comparable between the two groups. The findings indicated that there was no significant difference between the two groups regarding the incidence of need to inotropic agents. Duration of inotrope use was 26.8 ± 9.9 hours in the opium dependent patients and 36.1 ± 17.45 hours in the non opium dependent patients which was significantly lower in the opium addicted patients($p=0.042$).
Conclusion: Opium dependency has no effect on the need to inotropic agents during separation from cardiopulmonary bypass and the first day after CABG. But among those who need inotrope in these circumstances,the duration of need to inotropic support is shorter in the opium dependent patients.

Keywords: Opium dependent; Non opium dependent; CABG; Inotrope

1 Yardeni I, Beilin B, Mayburd E, Levinson Y, Bessler H. The Effect of Perioperative Intravenous Lidocaine on Postoperative Pain and Immune Function. *Anesth Analg*. 2009 Nov: **109**(5): 1464–1469
2 Vigneault L, Turgeon AF, Côté D, Lauzier F, Zarychanski R, Moore L *et al.* Perioperative intravenous lidocaine infusion for postoperative pain control: a meta-analysis of randomized controlled trials. *Can J Anaesth*. 2011 Jan; **58***(1)*:22–37
3 Koppert W, Weigand M, Neumann F, Sittl R, Schuettler J, Schmeltz M, *et al.* Perioperative Intravenous Lidocaine Has Preventive Effects on Postoperative Pain and Marphine Consumption After Major Abdominal Surgery. *Anesth Analg* 2004; **98**: 1050–1055

Paper No: 1304.0

Repeat-triage in disaster relief: experiences and lessons of the haitian earthquake

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Introduction: During a mass casualty disaster, the acute imbalance between need for treatment and capacity to supply care poses the challenge of how to prioritize care when the greater collective needs of the community compete with the best interest of the individual. Although the traditional ethical focus has been on whom to treat first, triage decisions that occur after care is initiated pose additional moral dilemmas.
Objective: To determine when triage points occur during care, and whether the ethics of the triage points once care was initiated (repeat triage) differ from the primary decisions of whom to treat first (initial triage).
Methods: A group of medical responders pooled accounts of ethical challenges they faced during the 2010 Haitian earthquake. Problems related to triage decisions were selected from these accounts. Instances of repeat triage were classified according to when the triage decision was made. Ethical differences between initial and repeat triage were considered.
Results: Triage points occurred when care had to be limited, when care had to be withdrawn, and when care was completed. Ethical differences between initial and repeat triage points include: 1. A fiduciary relationship has been formed between care-giver and patient, which increases the moral obligation towards the existing patient in comparison to potential patients
1. Limitation, withdrawal, and termination of care constitute active harm, by comparison to passive harm due to withholding of care in initial triage
2. Alteration of existing care without patient consent violates patient autonomy 4. Existing patients might command priority on basis of fairness of allocation by "first come first served" principle, assuming needs are equal 5. Greater uncertainty may exist in harm/benefit to potential patients versus existing patients 6. Health providers might feel the need to prioritize existing patients because these patients are indentifiable individuals. While this may not be morally defensible on pure utilitarian grounds, health providers have the right not to behave in ways that profoundly violate their personal and professional integrity.
Conclusion: Triage decisions made once care has been initiated have different ethical implications to initial triage decisions. Disaster responders should be aware of these implications, so as to guide their treatment during mass casualty situations.

References

1 McKie J, Richardson J The Rule of Rescue. *Social Science and Medicine* 2003, **56**: 2407–2419.
2 Zack N. Ethics for Disaster. In. Lanham Md Rowman & Littlefield; 2009.
3 Truog RD Triage in the ICU. *Hastings Cent Rep* 1992, **22**(3): 13–17.
4 Merin O, Ash N, Levy G, Schwaber MJ, Kreiss Y The Israeli field hospital in Haiti - Ethical dilemmas in early disaster response. *New England Journal of Medicine* 2010, **362**(11):e38.
5 Fink S India: Rationing in Disasters. In: Rationing health-Who lives? Who dies? Edited by Fink DWaS: PRI The World; 2010.

Paper No: 1305.0

Controlled Analgesia by Epidural Morphine with Minimal Doses

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Introduction: As a consequence of surgery, the onset of pain, apply adequate analgesia, is a fundamental mission of the anesthesiologist. In 1976T Yaksh and Rudy showed that application of morphine in the spinal level produced analgesia by blocking the conduction of nociceptive pathways, and established the basis for the application of spinal opioids. Morphine is an hydrophilic opioid, with a PK close enough to the blood pH. This allows the placement of catheters in epidural space to relieve pain. A method safety to assess the intensity of pain is the visual analogue scale.
Objective: To evaluate the quality of analgesia provided by the administration of epidural morphine 0.5 mg every 12 hours in post operative of hip replacement surgery, as assessed by Visual Analogue Scale.
Methods: Prospective clinical trial after obtaining informed consent to patients and approval by the Committee on Bioethics. We studied 76 patients undergoing hip arthroplasty F40/M36, age 71.7 ± 10.5 years, ASA I, II and III. Patients were placed epidural catheter before surgery and administering morphine 0.5 mg in 3 ml of physiological NaCl solution every 12 hours from the end of the intervention Analgesia

was assessed by visual analogue scale (VAS). Recording the first immediately after surgery, then every 12 hours until the end of intervention.
Results: Visual Analogue Scale (VAS) : first day, 75% mild pain VAS 1-2, 25% severe pain VAS 7-8, second day, 50% mild pain VAS 1-2, 50% moderate pain VAS 4-5; third day, 75% mild pain VAS 1-2, 25 % moderate pain VAS 4-5; fourth day 60% mild pain VAS 1, 40% moderate pain VAS 3. 15 patients (19%) presented had one or more side effects: Vomiting 9, nausea 13 and urinary retention 10.
Conclusion: Minimum dose of morphine by epidural catheter provides good postoperative analgesia in patients with hip replacement surgery, with minimal side effects. The injection of morphine doses of 0.5 mg in 3 ml of NaCl solution would ensure adequate dispersal of morphine in the epidural space

Paper No: 1309.0

Audit of Incidence of Medication Errors by Anaesthetists in North Western Nigeria

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Background: Patient management and safety issues are an important aspect of Anaesthesia practice. The relevance of medication and drug administration errors in our everyday practice cannot be over emphasized.
Objective: We set out to study the incidence of medication errors among Anaesthesia practitioners in Kaduna State, North Western Nigeria and to suggest ways to minimize such errors.
Materials and Methods: A questionnaire based study was conducted among Physician Anaesthetists and Nurse Anaesthetists working in the major secondary and tertiary hospitals in Kaduna State. The data obtained was analyzed using SPSS Version 17.0 and the data presented in relevant charts and tables.
Results: A total of 43 persons responded to the questionnaire with 30 males and 13 females, giving a male female ratio of 2.3:1. Most of the respondents (88%) work in tertiary government hospitals. Majority of the anaesthetists (56%) admitted to ever having a medication error. 79% of the anaesthetists attributed the medication error to problems with drug labeling. Of the patients in whom there was medication error, 44% suffered untoward sequelae ranging from cardiac arrest to delayed recovery from anaesthesia. Majority of the respondents recommend, vigilance, double checking of drug labels and colour coding of syringes as a ways to minimize medication errors.
Conclusion: Reduction of medication errors is an important aspect of patient safety. Vigilance remains the watchword in the safe conduct of anaesthesia.

Paper No: 1310.0

Subclavian vein access: to aim at the suprasternal notch or first thoracic vertebra?

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Introduction: Central venous access (CVP) is essential in patients needing intensive care, however its placement is challenging, often associated with failure to insert and life threatening complications. Pneumothorax, neck hematoma and brachial plexus injury is often encountered in upper body central venous access. Many techniques are in place on how to accurately place CVP. In aiming at suprasternal notch or first thoracic vertebra, the accuracy of subclavian central venous catheter insertion by infraclavicular technique is assessed.
Methods: Patients requiring venous access for hemdialysis were divided to Groups A and B each with fifteen patients. CVP placement was done by the authors, on the right side with patients in semi-Trendelenburg position. Number of punctures at mid-claviclar area were successful placement recorded. Group A had subclavian vein targeted by directing the needle to imaginary line towards the suprasternal notch or parallel to the floor. The subclavian vein in Group B was targeted by directing the needle to imaginary line towards the first thoracic vertebra or subtending 30 degrees to the floor
Results: Thirty patients 20 male, 10 female requiring renal replacement therapy had subclavian vein catheter inserted. Dialysis indications were renal disease secondary to: hypertension 12 patients, 8 diabetes mellitus and 10 patients were diabetic and hypertensive. Group A had 12 males and 3 females while Group B had 7 female and 8 males. Group A had 12 (80%) successful first punctures compared to (10 66.7%) in Group B. Second attempt was noted in three patients in all groups while in Group B three patients had third attempt Post insertion chest x-ray did not show catheter mal-position or complications.
Conclusion: Infraclavicular approach of subclavian CVP placement is safely achieved with no complication by aiming at suprasternal notch or first thoracic vertebra, however high accuracy is noted in the former than the latter.

References

1 Christopher J, Lillemoe, Keith D. in Manual of Common Bedside Surgical Procedures, 2nd Edition Lippincott Williams & Wilkins
2 Jean G, Chazot C, Vanel T, Charra B, Terrat JC, Calemard EG and. *Laurent C entral venous catheters for Nephrol Dial Transplant* (1997) **12**: 1689–1691

Paper No: 1314.0

Consequences of spinal cord puncture while attempting epidural anesthesia, effectiveness of treatment

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Introduction: The need to use large bore needles, in order to thread an 18 or 19G catheter into the peridural space, presents the feasibility of puncturing the spinal cord with a large bore, dull epidural needle, in the cervical, thoracic or upper lumbar regions.
Methods: Seven patients (6 females, 1 male) who had incidental spinal cord puncture while attempting to insert a catheter in the epidural space, were examined, diagnosed and followed. The punctures occurred at L1-L2 (2), T12-L1 (2), T6-T7 (1) and C6-C7 (2). The patients experienced severe paresthesia (referred to by the patients as "an electric shock like sensation in the brain or head") during attempts to find the peridural space. Weakness on both lower extremities was noted after recovery from the anesthetic in 4 patients. Three other patients had cauda equina (CE) like syndrome. Either 16 or 17G needles were used. Confirmation of the lesions was defined with MRI with contrast and neurological examination.
Results: Neurological deficits were diagnosed as CE (4) cervical plexus deficit (2) and paraparesis (1) which were clinically confirmed by MRI. All 7 patients had prolonged duration of the local anesthetic effect varying from 26 hrs to 4 days. Prolonged, clinically evident, neurological deficit lasted >2 days (2 pts), 3 to 6 days (1 pt.); up to 2 years (2 pts) and permanent neurological deficit (2 pts).
Conclusion: Injury to the spinal cord by epidural needles (EN) is a serious complication that may ensue in long lasting or permanent neuro deficit. Three of the early treated patients with the Aldrete Intravenous Infusion Protocol, administered in five consecutive days improved significantly and remained 90% near normal. In two other patients who had neurodeficit untreated for two years, the treatment was only 40% effective in reversing the neuro injury. Two patients treated after five years, from injury, had minimal improvement (20 to30%). Delayed treatment of neurodeficit from spinal cord punctures reduces possible cure.

References

1 Aldrete JA, Ferrari H Myelopathy with syringomyelia following thoracic epidural anaesthesia. *Anaesth Intens Care* 2004:**32**: 100–3.
2 Aldrete JA, Ferrari H Paraplegia from thoracic epidural anesthesia in a patient with sickle cell disease and normal Sa02. *Rev Mex Anest* 2004:**27**: 107–9.
3 Ramirez-Bermejo A, Aldrete JA, Godinez CN *et al.* Deficit neurologico y aracnoiditis secundario a anesthesia neuroaxial, rol de parestesias, punciones durales, anestesicos locales y genero. Protocolo para tratamiento. *Rev Soc Esp Dolor* 2009:**16**: 330–43.

Paper No: 1316.0

Progressive dural sac dilatation from repeat lumbar spine operations

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Introduction: Among the many deleterious effects from patients being subjected to repeated lumbar spine operations scarring, spread of fibrous tissue, skeletal and ligament loss, paravertebral muscle atrophy and spinal deformities are not unusual findings. Some of the above changes may also affect other crucial functions of the spine and dural sac contents. Specifically the normal rotation of the cerebrospinal fluid is affected by scarring and deformities of the dural sac.
Methods: The changes noted in the dural sac diameter in the lumbar region of a 36 year old construction worker, were followed in either sagittal or axial views of MRI images taken precisely at the levels where such diameter was the widest. The days of surgical intervention and when the MRIs with contrast were done was recorded.
Results: A progressive trend to widen the diameter of the dural sac was noted with each of the interventions performed in the lumbar spine. The changes that occurred after each of the surgical interventions were correlated to the changes that took place in the lumbar spine. Table 1.

MRI Date Surgery	Date Surgery	Dural	Sac	Image
08/08/1995	Pre-Surgery Dx: HNP	L4-L5 & L5-S1	1.2 cm	Figure 1
06/16/1997	10/21/1996	Discectomy x2	1.7 cm	Figure 2
06/16/1998	12/02/1997	Exploration & Laminotomy x2	1.9 cm	Figure 3
10/03/2000	06/08/1999	Removal of Hardware	2.1 cm	Figure 4
07/18/2001	02/21/2001	Implantation of cages L5-S1	2.9 cm	Figure 5a, 5b
05/04/2004	03/04/2003	Implantation of Pedicular Screws	3.2 cm	Figure 6

Discussion: Gradual postoperative dilatation of the distal dural sac not only produces moderate to severe sacral and

low lumbar painful pressure, but also by delaying the usually normal rotation of the Cerebrospinal Fluid it allows the CSF to stagnate in the distal tip of the sac eventually dilating it. By this mechanism the normal function of proprioception is altered, resulting in dizziness, frequent falls, stumbling and further injuries as well as significant changes in vision, hearing and balance of patients that underwent repeated distal lumbar spine surgery and resulted in stagnation of CSF.

References

1 Aldrete JA, Ghaly RF Cystic formations in and around the dural sac. In Arachnoiditis: the evidence revealed. Aldrete JA (ed) Mexico, Editorial Alfil; 2010: pp. 89–100.
2 Aldrete JA The Failed Back Surgery Syndrome. Aldrete JA (ed), Rosario, Corpus 2006: pp.15–36.

Paper No: 1317.0

High dose versus lower dose magnesium sulfate infusion in tetanus: a goal directed approach

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Introduction: Tetanus is resurging globally due to rise in acquired immunodeficiency syndrome and widespread use of immunosuppressive drugs and migration of the unimmunized population.1
Objectives: We aimed to compare two doses of its infusion used in our ICU.
Methods: All tetanus patients admitted in the ICU were identified and their data retrieved from the hospital record section. We could retrieve complete data of 14 patients. Amongst them, 12 adult male patients received magnesium infusion aimed to control tetanic spasms. We retrospectively divided them into two groups based on doses of magnesium used. In group 1 (n=7) a smaller dose (<1 gm/hr) was given than in group 2 (n=5) (1 to 2 gm/hr). We compared patient characteristics, injury types, Ablett grade, need for ionotropic support, diazepam requirement for spasm control, control of spasms, duration of ventilation, ICU stay and recovery pattern between the two groups.
Results: The duration of symptoms before arrival to hospital was significantly longer in group 1 (2.7 ± 2days) than group 2 (2 ± 0.7days). The Ablett severity was lower (grade 2) in three patients in group 1 although this difference was not statistically significant. Spasms were controlled adequately in all patients in group 2 while only in patients with lower Ablett severity grade in group 1. In group 1, we could not increase the dose of magnesium in 4 patients having Ablett grade 3 despite inadequate spasm control because of hypotension. Use of magnesium gradually reduced the dose of diazepam required to control spasms.
Conclusion: Magnesium infusion should be titrated to control tetanic spams as an adjunct to diazepam. Larger dose of magnesium may be appropriate but in selected group of patients of the tetanus because of limitations of its use in conditions like renal failure or hypotension coexisting or developing during the course of illness. Smaller dose may be adequate to control spasms in patients with lesser Ablett severity grade.

Reference

1 Gibson K, Kiviri W. Tetanus in developing countries: a case series and review. *Can J Anesth*. 2009; **56**: 307–15.

Paper No: 1318.0

Effects of Intra-articular Dexmedetomidine vs Bupivacaine on Postoperative Analgesia in Patients Undergoing Arthroscopic Knee Surgery

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Background: Dexmedetomidine is an alpha-2 agonist with sedative and analgesic properties. This study compared the postoperative analgesic effects of intra-articular dexmedetomidine with those of bupivacaine and saline.
Methods: After Ethics committee approval, 51 patients scheduled for arthroscopic meniscal surgery were randomized in a double blind fashion to receive either dexmedetomidine 1 μg kg-1 (group D), bupivacaine 0.25% (group B), or saline (group S) intraarticularly (total volume 20 ml). All patients received a standardized general anesthetic with propofol, fentanyl, and sevflurane. Postoperatively, acetaminophen 500mg/codeine 30mg oral tablet was given every four hours, and tramadol 1 mg kg -1 IV was administered every 6 hours, as needed, for rescue analgesia. Visual analogue scale (VAS) scores (0-10), time to first analgesic request, and the total dose of postoperative analgesics were recorded. Repeated measures ANOVA were used to analyse VAS scores, whereas ANOVA was used to assess the other variables. Data presented as mean ± SD and significance was defined as $p<0.05$.
Results: VAS scores were lower in groups D and B compared with group S (Figure, $P<0.01$). Times to first analgesic were 343 ± 27 vs.440 ± 3 vs. 43 ± 5 min for groups D, B, and S, respectively ($P<0.01$). Total dose of rescue tramadol were 180 ± 56 vs. 160 ± 51 vs. 413 ± 52 mg, respectively ($P<0.01$).

Conclusions: Intraarticular dexmedetomidine provided comparable analgesia to bupivacaine 0.25% in patients undergoing arthroscopic knee surgery.

1 *Anesthesia and Analgesia*,1999,**89**: 652–8
2 *Journal of Pain and Symptom Management*, 1998,**15**: 102–9.
3 State Trait Anxiety Index, http://www.mindgarden.com/products/staisad.htm

Paper No: 1319.0

Preferences of High and Low Anxiety Patients in Avoiding Common Anesthetic Outcomes and Their Immediate, 24, and 48 Hour Postoperative Recovery

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Anesthesia side effects can be a source of concern to patients undergoing surgical procedures. Patient preferences in avoiding common anesthesia side effects were previously reported from 101 patients at a community hospital (1). Anxiety may interfere with medical treatments and outcomes, including recovery from anesthesia and surgery (2). The prior study was extended to to compare how anxiety might affect negative clinical anesthesia outcomes as well as what effect it may have on patient complaints, their perception of prior anesthetic experiences and pain at 0, 24 and 48 hours postoperatively.
Methods: Patients awaiting elective surgery provided IRB approved informed consent. Ten clinical anesthetic outcomes were ranked from 1="Most want to avoid" through 10 "Least want to avoid." On POD 2, patients completed an online survey which asked them to re-rank their negative clinical outcomes, rank their pain at 0, 24 and 48 hours postoperatively and to list any complaints they may have from this current anesthesia experience.
Results: Groups did not differ in preferring to avoid common anesthetic outcomes. Compared to the pre-anesthesia rankings, the POD2 rankings did not change overall for HIGH or LOW anxiety quartiles. Anxiety did not mediate current anesthetic complaints ($p=0.0807$), and it did not mediate pain perception at 0, 24, and 48 hours ($p=0.3239$). 28% of patients reported prior negative outcomes, with high anxiety patients being more likely to report these ($p=0.0024$). High anxiety patients also reported higher absolute pain scores at all intervals ($p=0.02$, <0.0001, 0.0122, respectively).
Discussion: The results suggest that anxiety does not mediate how patients rank negative clinical anesthesia outcomes as both groups want to avoid gagging on the ETT, pain and nausea more than any other outcome. The study uncovers that high anxiety patients do have more complaints regarding their prior anesthetic experience which leaves the question of whether anxiety or prior anesthetic experiences are the end-product. In addition, high anxiety patients report more absolute pain suggesting that these patients may require additional intervention preoperativly.

Paper No: 1320.0

Fibrinogen concentrate causes a short-lived increase in plasma fibrinogen and fibrin-based clot quality when used as first-line haemostatic therapy during aortic replacement surgery: a randomised trial

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Background: Fibrinogen is the first coagulation factor to reach critically low levels in major surgical bleeding. Following cardiopulmonary bypass (CPB), declining plasma fibrinogen levels reduce fibrin-based clot quality and increase postoperative blood loss. Haemostatic intervention may therefore include fibrinogen replacement, although it is not clear how CPB and haemostatic therapies impact upon fibrinogen levels, or how long-lived the effects are.
Methods: A prospective, randomised, placebo-controlled trial ($N=61$) was performed to investigate fibrinogen concentrate as a first-line haemostatic therapy in adults undergoing elective aortic replacement surgery. Following removal from CPB, bleeding patients received fibrinogen concentrate (FC group; $n=14$), allogeneic blood products (allogeneics group; $n=32$), or fibrinogen concentrate followed by allogeneic blood products (FC+allogeneics; $n=15$). Fibrinogen concentrate infusion reduced perioperative blood loss and transfusion requirements (data presented elsewhere). Here we focus on plasma fibrinogen levels (Clauss assay) and fibrin-based clot quality (ROTEM®-based FIBTEM assay), which were recorded during surgery and up to 10 days after.
Results: Plasma fibrinogen and FIBTEM maximum clot firmness (MCF) decreased by around 50% by CPB removal. For patients receiving fibrinogen concentrate, both parameters recovered to near-preoperative levels by the time of last suture. Fibrinogen and FIBTEM MCF did not differ between the FC and FC+allogeneics groups. In contrast, fibrinogen and FIBTEM MCF recovered only marginally by last suture in the allogeneics group, remaining lower than in either the FC or FC+allogeneics groups ($p<0.001$). This difference was short-lived, and all groups displayed comparable measurements by 24 hours post-surgery. Plasma fibrinogen and FIBTEM MCF increased acutely thereafter, reaching 150-200% of preoperative levels by postoperative day 10 for all groups.
Conclusions: Intraoperative fibrinogen concentrate infusion significantly increases plasma fibrinogen and fibrin-based

clotting. These increases are small and short-lived relative to the acute postoperative fibrinogen elevation observed for all patients undergoing CPB.

Paper No: 1321.0

Effect of pregabalin on preoperative anxiety and postoperative pain after total abdominal hysterectomy -a dose ranging study

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Introduction: Pregabalin is an attractive option as an adjunct for postoperative analgesia as it has analgesic properties and prevents opioid tolerance. In addition it is known to relieve anxiety as well

Objective: To evaluate the role of pregabalin in the reduction of pre operative anxiety, post operative pain and opioid analgesic usage in different doses in patients undergoing elective abdominal hysterectomy.

Methods: After obtaining Institutional ethics committee approval, a prospective, randomized, double blind, placebo controlled trial was conducted in 60 ASA I and II consenting patients aged 18 to 60 years. The patients were divided into three groups based on computer generated random number table. The patients in Group P1 received 150 mg of pregabalin, Group P2 received 300 mg of pregabalin and Group C received placebo. The drugs were administered orally two hours prior to induction. Primary outcome (anxiolysis, postoperative analgesia, opioid sparing effect) and secondary outcome (reduction in opioid related side effects such as - respiratory depression, nausea and vomiting and pruritis) were studied.

Results: The mean VAS scores for anxiety were significantly lower in the pregabalin groups when compared to placebo [Group P1 ($p=0.02$) and Group P2 ($p=0.01$)]. Total postoperative morphine consumption was higher in Group C (49.0 ± 14.0) as compared to Group P1 (39.18 ± 5.5) and Group P2 (39.7 ± 15.1). However, it was statistically insignificant ($p=0.053$). The mean VAS scores for pain at rest and movement in first 8 hrs after surgery was significantly less in the pregabalin groups as compared to placebo, whereas they were comparable after 8 hr. The number of patients who had PONV were significantly higher in placebo group (14, 70%) as compared to Group P1 ($p=0.013$) and Group P2 ($p=0.042$). The patients who had pruritis in Group P1 were 6(32%), in Group P2 were 4(20%) and in Group C were 16(80%) which was statistically significant.

Conclusion: Preoperative administration of pregabalin two hours prior to surgery decreased preoperative anxiety as compared to placebo. Use of pregabalin in doses of 150 mg and 300 mg decreased postoperative VAS scores for pain at rest and on movement in the initial 8 hrs after surgery. Although, pregabalin did not demonstrate significant opioid sparing effect, it was effective in decreasing the opioid related side effects such as PONV and pruritis.

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PAEDIATRIC ANAESTHESIA

(The names of the authors presenting each paper are shown in bold type)

Paper No: 7.00

6mg/kg Oral Ketamine Premedication in Children Results in Oversedation

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Introduction and Objectives: We undertook this study to compare the effectiveness of placebo vs 3mg/kg vs 6mg/kg oral ketamine as a premedicant in children(ASA 1 and 2 aged 1-10yrs) presenting for elective surgery at Port Moresby General Hospital, Papua New Guinea. This agent is freely available throughout the world and has been recommended as a safe and reliable sedative for premedication and as a sole agent for sedation for procedures such as radiology where it is required that a child be still.

Methods: After Institutional Ethics Committee approval and obtaining Informed Consent from the accompanying parent, patients received doses of study solution that was administered with 0.2ml/kg cola. The level of sedation was assessed after 30mins by a blinded trained observer who scored on a four point scale from unrouseable to awake and agitated. All patients were monitored and directly observed in the Theatre Suite after administration of the study solution.

Results: The placebo group resulted in 20 patients assessed as unsedated with five sedated. The 3mg/kg Ketamine group resulted in nine patients assessed as being distressed and sixteen sedated. The 6mg/kg group resulted in no patients being assessed as being distressed with 21 relaxed or asleep but four were deeply asleep. The use of oral ketamine resulted in a statistically significant increased level of sedation compared to placebo. These results were present in both ketamine 3mg per kg ($p = 0.002$) and 6mg per kg ($p < 0.001$). However 4 out of 25 patients who received 6mg/kg of Ketamine were deeply asleep compared with the 3mg/kg Ketamine group where none were so affected $p = 0.037$

Discussion and Conclusion: We found that 16% of children who received 6mg/kg oral ketamine were oversedated and difficult to rouse whereas none of those receiving 3mg/kg ketamine or placebo were assessed thus. Similar studies have not usually investigated oversedation as an outcome. One other study reported 13% oversedation with the 6mg/kg dose. We believe that oversedation to a level of difficult to rouse should be seen as an adverse outcome.

References

1 Turhanoglu S, Kurarmaz A, Ozyilmaz MA, Kaya S, Tok D. "Effects of different doses of oral ketamine for premedication of children". *European Journal of Anaesthesiology*. 2003 Jan; **20**(1): 56–60

2 Darlong V, Shende D, Subramanyam MS, Sunder R, Naik A. Oral ketamine or midazolam or low dose combination for premedication in children. *Anaesth Intensive Care*. 2004 Apr; **32**(2): 246–9

3 Sekerci C, Donmez A, Ates Y, Okten F. "Oral ketamine premedication in children (placebo controlled double-blind study)". *European Journal of Anaesthesiology*. 1996 Nov; **13**(6): 606–11

4 Gustein HB, Kirsten LJ, Heard HB. Oral ketamine preanaesthetic medication in children. *Anaesthesiology* 1992; **76**:28–33.

5 Kulkarni JA. Oral ketamine for premedication in Children. *Bombay Hospital Journal* 2003, July; **45**(3) 6.

Paper No: 22.00

Administration of ropivacaine with low dose ketamine reduces cytokine expression after major abdominal operation in chidren

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Background: Inflammation and nociceptive sensitization are hallmarks of tissue surrounding surgical incisions. Our studies were directed towards determining if administration ropivacaine with low dose ketamine alter

cytokine production after major abdominal operation in children.
Methods: A 44 children after major abdominal operation was used to measure the effects of infiltrative administration ropivacaine 0.2% with low dose ketamine (0,1 -0,3 mg/kg i.v.) administration on cytokine production in blood 45 minutes, 4 hours after operation. We examination 44 patient, undergoing major abdominal operation in children, first group receive combination ropivacaine with low dose ketamine, second group receive morphine (0,1 ml per year). For statistical analysis 2 tests were used.
Results: Operative incised abdominal wall displayed profound allodynia which was reduced by ropivacaine with low dose ketamine combination in the 4 hours following incision. Blood samples these patients showed enhanced levels of 3 cytokines: IL-1β, IL-6, tumor necrosis factor alpha (TNFα). Ropivacaine with low dose ketamine administration reduced levels. First group lower cytokines levels over second group (mean +/- SD, IL-1β - 8.1 +/- 1.1 vs. 18.1 +/1.3 pg/mg protein; IL-6- 244.3 +/- 108.4 vs. 611.1 +/- 102.2 pg/mg protein; TNFα - 22.2 +/- 4.1 vs. 64.4 +/- 8.4 pg/mg) ($p < 0.001$).
Conclusion: Ropivacaine with low dose ketamine administration reduces cytokine expression. These studies suggest that Ropivacaine with low dose ketamine combination may alter the inflammatory reaction.

References

1 Achar S, Kundu S. Principles of office anesthesia: part I. Infiltrative anesthesia. *Am Fam Physician*. 2002; **66**(1):91–4.
2 Heavner JE Local anesthetics. *Curr Opin Anaesthesiol*. 2007; **20**(4): 336–42.

Paper No: 23.00

Neonatal pain syndrome after thoracic surgery correlates with raised level of cortisol, interleukin 6 (IL6), IL8 (IL8) and C-reactive protein (CRP)

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Background: One of the most difficult challenges still facing researchers and clinicians is assessing pain in the newborn. The mechanisms contributing to neonatal pain syndrome (NPS) in infants are multifactorial. Recent evidence suggests a potential pathogenetic role for inflammation.
Objective: To examine the relationship between serum concentrations of inflammatory mediators, cortisol (hydrocortisone) and SNPS after thoracic surgical procedure.
Methods: Prospective observational study involving term neonates with NPS after thoracic surgery and normal controls. All patients after operation received adequate analgesic therapy (continuous infusion opioid analgesics). Blood samples were taken at birth from peripheral venous blood, at 8 h, 24 and 42 h for cytokines, cortisol and CRP after surgical procedure. For statistical analysis 2 tests were used.
Results: 26 neonates (4,1 +/- 0,2 days) with SNPS and 20 controls (4,2 +/- 0,1 days) were enrolled. 14/26 (53,8%) neonates with SNPS required mechanical ventilation, 9/26 (34,6%) required high-frequency ventilation and 1/26 (3,8%) required ECMO; 2/26 (7,7%) died. Neonates with NPS had more than threefold higher serum levels of interleukin 8 (IL8) than the controls ($p < 0.05$). At 8 h, 24 h and 42 h, serum IL6 and CRP were 2.90- fold higher in neonates than the controls group ($p < 0.003$). All patients with NPS had significantly ($p < 0.001$) higher plasma cortisol levels over control group (mean +/- SD, 454.52 +/- 48.80 vs. 221.21 +/- 40.39 micromol/l on 8 h; 750.12 +/- 101.4 vs. 348.22 +/- 104.0 micromol/l on 24 h; 588.02 +/- 60.3 vs. 303.3 +/- 61.2 micromol/l in 42 h).
Conclusion: This study demonstrated that severe neonatal pain syndrome is associated with raised blood levels of proinflammatory mediators and cortisol, suggesting that inflammation contributes to the neonatal pain syndrome.

References

1 Ramsay D, Lewis M. Reactivity and regulation in cortisol and behavioral responses to stress. *Child Dev*. 2003; **74** :456–464
2 Gibbins S, Stevens B. Mechanisms of sucrose and non-nutritive sucking in procedural pain management in infants. *Pain Res Manag*. 2001; **6**: 21–28.

Paper No: 88.00

Anesthesia in surgical separation of omphalopagus conjoined twins

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Introduction: Conjoined twins were first reported BC. The first successful surgery dates back from 1689. Incidence is 1/50000 pregnancies and approximately 1/250000 live births.
Objectives: Description of this surgery in a non-pediatric, general-public hospital setting, overcoming its related limitations and assuring a successful outcome.
Methods: Omphalopagus twin pregnancy was ultrasound-confirmed in the 5th month of pregnancy. C-section was scheduled. Twins weighed 5.095 kg in all. Apgar score for both: 9/10. Abdominal scan showed that liver was shared on the front anterior side. Magnetic resonance angiography did not show cross circulation. No other abnormality was detected. Multidisciplinary meetings were organized to discuss the feasibility of a successful surgery. Our team was composed by 2 anesthesiologists assisting each twin, and a team leader to coordinate the whole activity. We were also

in charge of monitoring, fluids and electrolytes control, and postoperative pain management. Surgery was scheduled to be performed when the patients turned 3 months old. Total weight: 10.720 kg. No previous medication was administered to reduce any potential adverse effect. Anesthetic induction was performed simultaneously in the twins with Sevoflurane. Endotracheal intubation was particularly difficult due to the small anatomical room available to perform it. To do this, one twin was placed supine and the other was supported in such a manner that the space above the face of the other one was unobstructed. Induction was followed by Remifentanil 0.4 mcg/kg/min and the relaxation was performed with Atracurium 0.5 mg/kg. Monitoring was performed with central venous catheter, pulse oximetry, temperature control, ECG and urine output. No blood transfusion was required. The total duration of surgery was 120 min. Morphine 0.05 mg/kg was administered subsequently for pain.

Results: After 22 days, they were successfully discharged from hospital without showing any sign of complication. Twins are alive, without showing any sequel.

Discussion: The logistic and the technique to be performed had to be thoroughly planned due to the lack of antecedent of similar cases in a general hospital. Surgical room was conditioned to meet the requirements so its limitations could be overcome.

Conclusion: The satisfactory intrasurgical and postoperative outcome showed that the choice of both, the moment of surgery as well as the technique used, was appropriate. Successful outcome proved that having an adequate team makes this kind of surgery possible even in a general hospital setting.

Keywords: Omphalopagus; Pediatric anesthesia; Surgical separation of conjoined twins

References

1 Mchugh K, Kiely EM, Spitz L. Imaging of conjoined twins (Review). *Pediatr. Radiol.* 2006; **36**: 899–910.

2 Van Der Weiden RM. The first successful separation of conjoined twins (1689). *Twins Res* 2004; **7**: 125–127.

3 Ebensperger A., et al. Gemelos onfalópagos con síndrome de transfusión Gemelo-gemelar. Rev. Chilena de Cirugía. Vol 62- N° 2, Abril 2010; pág. 188-196.

Paper No: 100.00

Perioperative pain management for below the knee amputation in a failing fontan patient with severe immunosupression from macrophage activation syndrome

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Introduction: We describe a child with chronic pain and complex medical history who presented with several perioperative management challenges. Case Description A ten year-old boy with a history of chronic pain, double-inlet left ventricle with transposition of the great arteries and palliated Fontan physiology was scheduled for bilateral below the knee amputations for lower limb necrosis. On admission for acute onset multi-system organ failure as a result of macrophage activation syndrome, he was emergently placed on ECMO. He had a protracted post- ECMO course. His pain regimen consisted of gabapentin, methadone, lorazepam, and clonidine patch for preoperative pain control and sedation. An aggressive intraoperative and postoperative plan was devised to decrease the development of phantom limb pain. Intraoperatively, bilateral infragluteal sciatic nerve catheters were placed and dosed with Ropivicaine until POD 5.. Ketamine infusion was also stared intraoperatively and continued until POD 3. Gabapentin and methadone doses were increased to ensure adequate pain control. He also remained on lorazepam and a clonidine patch until POD 6 when these medications were tapered. The patient exhibited no signs of phantom limb pain, and his chronic pain diminished to a level managed with lorazepam, methadone, and clonidine.

Discussion: Phantom limb pain has been reported to occur in 48% of children with cancer-related amputations and 12% of children with trauma-associated amputations. (1-2) A multimodal approach and a combination of therapies can enhance analgesia with fewer untoward side effects in the child with chronic pain. (3) Regional anesthesia and other adjunct therapies such as intraoperative ketamine infusion are described (4) and becoming more prevalent with pediatric anesthesiologists.

References

1 Krane EJ, Heller LB. The prevalence of phantom sensation and pain in pediatric amputees. *J Pain Symptom Manage*. 1995 Jan; **10**(1): 21–9.

2 Smith J, Thompson JM. Phantom limb pain and chemotherapy in pediatric amputees. *Mayo Clin Proc.* 1995 Apr; **70**(4):357–64.

3 Kost-Byerly S. New concepts in acute and extended postoperative pain management in children. *Anesthesiol Clin North America*. 2002 Mar; **20**(1):115–35.

4 Vas L. Continuous sciatic block for leg and foot surgery in 160 children. *Paediatr Anaesth*. 2005 Nov; **15**(11): 971–8.

Paper No: 136.00

Quality evaluation of Rocuronium bromide during tracheal intubation in pediatric patients with heart diseases less than 6 months

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Introduction: Muscle relaxants show some differences in pediatric patients. These differences are more pronounced in neonates and infants, precisely because these age groups are the particular physiological characteristics.
Objetives: To evaluate intubation conditions using Rocuronium bromide at 60 seconds after administration.
Methods: We performed a descriptive, prospective, transversal study, included 48 cardiac patients younger than 6 months for correction of congenital heart disease. Preoperative medication was used with Midazolam 0.1 mg / kg IM, Racemic ketamine 5mg/kg IM and Atropine 0.02mg/kg IM. The induction of anesthesia was done using total intravenous anesthesia with midazolam 0.1mg/kg, Fentanyl 5mcg/kg and Rocuronium bromide 0.6mg/kg. The air way was approached one minute after the relaxing run. The intubation conditions were observed according to the modified scale Domaoal 60 seconds after administration of the muscle relaxant. This scale include, relaxation grade of the masseter muscle, quality of laryngoscopy, vocal cord movility and rejection of the endotracheal tube. We appointed 1 to 4 points depending of the patient́s response. Higher score mean greater difficulty of intubation which was defined in excellent, good, fair or poor. We evaluated heart rate, rhythm, SpO2 and any cutaneuos anaphylactic reaction during and after anesthesia induction. The relationship between cyanotic and non cyanotic congenital heart defects and the use of rocuronium was evaluated too.
Results: Intubation conditions were excellent in 45 patients and good in 3, there were not modification of heart rate, rhythm, SpO2 . We did not find cutaneuos anaphylactic reaction and there was not relationship between cyanotic and non cyanotic congenital heart disease.
Conclusions: Rocuronium bromide is an effective relaxant for rapid control of the airway in patients with heart disease younger than 6 months.

References

1 Lee SK, Hong JH, Kim AR. Is the rapid sequence induction possible with 0.6 mg/kg rocuronium in pediatric patient?; *Korean J Anesthesiol*. 2010 Jan; **58**(1):20–4.
2 Bock M, Haselmann l, Bottiger BW, Motsch J. Priming with rocuronium accelerates neuromuscular block in children: A prospective randomized study. *Can J. Anaesth* 2007; 54:538–43
3 Chatrath V, Singh I, Chatrath R, Arora N. Comparison of intubating conditions of rocuronium bromide and vecuronium bromide with succinylcholine using “timing principle”; *Anaesthesiol Clin Pharmacol*. 2010 Oct; **26**(4):493–7.
4 Liou J, Hsu J, Liu F, Ching-Wah Sum D, Lui P. Pretreatment with small-dose ketamine reduces withdrawal movements associated with injection of rocuronium in pediatric patients. Anesthesia And Analgesia [serial on the Internet]. (2003, Nov), [cited June 29, 2010]; 97 (5):1294–1297. Available from: MEDLINE with Full Text.

Paper No: 137.00

Internal jugular venous canalization by anterior right access for the anesthetic management of pediatric patients with heart diseases

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Introduction: To prove the utility of the internal jugular venous canalization by anterior right access for the management of pediatric patients with heart diseases.
Objetives: To determinate the usefulness of the internal jugular venous canalization by anterior right in cardiac pediatric patients.
Methods: We performed a prospective, analytical, descriptive and observational study which included 200 patients younger than 1 year, were placed supine, head in central position, 15 degrees trendelemburg and interscapular shim, arterial pulse was located at cartilage cricoids level and lateral to this we proceeded to puncture the internal jugular vein to place the catheter by the Seldinger method. We measured the distance between the skin to jugular internal lumen making a mark at skin level in intravenous cannula which was used during the puncture.
Results: We localized the internal jugular vein in the first attempt in 89% of patients, we located the internal jugular vein on average 1.2 cm from skin to the jugular lumen and it was not necessary to introduce the catheter more than 6 cm. Complications included impossibility to find the venous in four children, and arterial puncture in one of them.
Conclusions: Internal jugular venous canalization by anterior right access is a useful way and easily accessible for the management of pediatric patients with heart diseases.

References

1 Roth B, Marciniak B, Engelhardt T, Bissonnette B. Anatomic relationship between the internal jugular vein and the carotid artery in pre-school children: an ultrasonographic study. *Pediatric Anaesth* 2008 Nov; **Vol 18**(11):1045–9
2 Downie L Sschalop, Mazurek JN, Savitch G, Lelonek GJ, Olson TR. Bilateral Duplicated Internal Jugular Veins: Case Study and Literature Review. *Clinical Anatomy*. 2007; **20**:260–6.
3 Satheesha Nayak. Surgically Important Variations of the Jugular Veins. *Clinical Anatomy*. 2006; **19**:544–546.
4 Arul Ganeshan, Dinuke R, Warakaulle , Raman Uberoi. Central Venous Access. *Cardiovasc Intervent Radiol*. 2007; **30**:26–33.

Web-site information: 47%	Written information: 17%	Operation-room visit: 14%	No need for additive information: 22%

Paper No: 154.00

Calculating dose of sugammadex in obese male children undergoing minor urological procedures

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Introduction: According to International Obesity Task Force (IOTF), children with BMI above the 95th position (for sex and age) are obese. Greece has the highest percentage of overweight children in Europe. The latest statistical data showed that about 4/10 children are obese under 10 years old. Sugammadex is a new reversal neuromuscular agent.
Objectives: The purpose of this study is to determine the effective dose of this drug according to the total body weight or the ideal body weight.
Method: The study took place from February 2010 to May 2011. After written concent of parents and approval of hospital ethical committee, 22 obese children between 5-11 years old, ASA I were enrolled. Induction of anaesthesia was achieved with Atropine 0,01 mg/kg, Propofol 2 mg/kg, Remifentanyl 0,3 mcg/kg/min and Rocuronium 0,6 mg/kg based on actual body weight. For maintenance of anaesthesia we used mixture O2/air (40/60), Desflurane 7%, Remifentanyl 0,2 mcg/kg/min and repeated doses of rocuronium 0,15 mg/kg as needed. At the end of the surgical procedure they were randomized to receive either Sugammadex 2 mg/kg (n = 11, according to IBW), or Sugammadex 2mg/kg (n = 11, according to TBW) at 2/4 TOF responses using acceleromyography (AMG). At first we calculated time from administration of sugammadex to reached TOF > 0,9 (time TOF). Secondly we measured time from administration of sugammadex to tracheal extubation (time EXTUB). Data were presented as mean,plus-minus standard deviation. Student T-test was used for comparison using SPSS version 17. A p-value < 0,05 was considered statistically significant.
Results: Demographic data were statistically similar in both groups as well as dose of Sugammadex and time TOF. The only difference was a shorter extubation time observed in group TBW. Group TBW (n = 11) Group IBW (n = 11) p-value Age (years) 7,78+1,71 7,64+1,34 0,838 Weight (kg) 46,32+11 45,08+8,07 0,768 Length(m2) 1,39+0,12 1,40+0,10 0,856 Dose Sugammadex 92,64+22 85,81+15,03 0,407 time TOF(sec) 88+10 95+8 0,087 time EXTUB(sec) 138+16 155+14 0,018* *p < 0,05.
Conclusions: Calculating Sugammadex in a dose of 2 mg/kg according to TBW seems to be safe in obese children, secures the reversal of neuromuscular blockade and shortens the time for extubation. More studies with larger sample size are necessary for safer results.

Paper No: 161.00

Age-specific web-based information to prepare children and parents for anaesthesia and surgery

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Introduction: Despite the use of verbal and written information prior to anaesthesia and surgery many children and parents still arrive to the OR unprepared for the experience. The goal of this project was to create a web-based age-specific information system that may improve children and parent comfort prior to anaesthetic induction.
Background: Following a preparation period of 9 months involving a multidisciplinary team (nurses, doctors, advertising agencies and web-designers) plus extensive interviews with children and parents the information system was launched at our hospital in November 2006. The system is interactive and contains for example age-specific cartoons, web-books, videos and interviews with pre-school and school children as well as teenagers. It also contains information for parents in 25 languages. The site has an average 1500 visitors monthly, including visitors from more than 20 different countries to date.
Patients and methods: During the audit period September-December 2007, 2076 children underwent anaesthesia of which 1350 (65 %) were elective. All families whose children were planned for elective procedures associated with anaesthesia where encouraged in their scheduling letter to visit the web-site prior to their hospital visit. A questionnaire was prepared for parents and distributed to them immediately following the anaesthesia induction. The parents were asked to answer the questions during their stay in the waiting room and collected by the staff at the recovery unit.
Results: 94% of the respondent parents felt well-informed after visiting the website. 93 % of the respondent parents also felt that their child was well-informed after the visit. When asked what they would like to receive as supplemental information to future pre-anaesthetic visits to the anaesthesiologist, most preferred web-based information over written information or an operating room tour (table 1). 22 % of the respondent felt well-informed after visiting the web-site and expressed no need for additive information to the

pre-anaesthetic visit to the anaesthesiologist. Table 1 What information would you like to receive in the future as a complement to the regular pre-anaesthetic visits to the anaesthesiologist?

Limitations/Future development: Despite that parents and children were encouraged to visit the web-site at the regular preoperative meeting with the anaesthesiologist still only a minority in fact did so (30%). To generate even better results substantial efforts are needed to improve the use of this information tool.

Conclusions: Based on the results of the audit of our web-based information system we conclude that it was well received by the families and was preferred to more traditional options, e.g. written information and pre-anaesthetic operating room tours. This web-based information system provides a new, modern and effective tool to provide pre-anaesthetic information.

Paper No: 260.00

Airway management with supraglottic airway device at pierre robin sequence

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Introduction: Pierre Robin Sequence (PRS) is a congenital syndrome characterized with glossoptosis, retrognathia and micrognathia. Also a high incidence of temporomandibular joint ankylosis has been described in PRS (1). Those craniofacial anomalies often make mask ventilation and airway management difficult. Neonates and babies with PRS may be affected in different degrees of airway obstruction, feeding difficulties and chronic hypoxemia (2).

Objective: Is to describe the successful technique of awake insertion of a new supraglottic airway device (I-gel), followed by inhalated induction of anesthesia of two patients with PRS.

Methods: First case: A-28-day-old preterm neonate weighing 2,4 kg with PRS having micrognathia was admitted for gastrostomy. Difficult intubation was anticipated. After securing intravenous access and connecting to the monitors, 100% oxygen was administered for 3 minutes. His baseline heart rate was 135 /min, blood pressure was 70/45 mmHg, and oxygen saturation was 98%. After inhalation induction with oxygen and sevoflurane 8%, breathing spontaneously, direct laryngoscopy with an optic view laryngoscope was made and intubation was tried, but it was unsuccessful. Than no = 1 I-gel was administered to secure the airway. The oxygen saturation was 97-99% throughout the procedure. Second case: A-60-day-old infant weighing 3,5 kg with severe micrognathia, cleft palate, extremity anomalies was admitted for right and left achillotomy. Her respiratory sounds were rough, bilaterally. After routine standard anesthesia monitoring and pre-oxygenation, inhalation induction was done with oxygen and sevoflurane 8%, breathing spontaneously, than no = 1,5 I-gel was administered to secure the airway. The oxygen saturation was 97-98% throughout the procedure.

Conclusion: There were no descriptions of problems with ventilation before, during, or after induction, suggesting that the supraglottic airway device (I-gel) provided excellent airway control in PRS.

References

1 Denny AD, Talisman R, Hanson PR, Recinos RF. Mandibular distraction osteogenesis in very young patients to correct airway obstruction. *Plast Reconstr Surg* 2001: **108**: 302–311.

2 Schaefer RB, Stadler III JA, Gosain AK. To distract or not to distract: an algorithm for airway management in isolated Pierre Robin sequence. *Plast Reconstr Surgery* 2004: **113**: 1113–1125.

Paper No: 265.00

Neonatal anesthesia and mortality in The University Hospital of Neiva (Colombia) in 2011

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Introduction: Neonatal anesthesia is the highest level of complexity in pediatric patients. In order to ensure a better service quality in the surgery rooms, it is necessary to achieve the basis for the analysis and the measures of improvement by knowing the mortality of the neonatal anesthesia.

Objective: We retrospectively reviewed the cases of all newborns taken to any procedure under general anesthesia and their mortality up to 7 days to determine our statistics.

Methods: A retrospective and descriptive study was performed in which the admission and discharge books from the neonatal intensive care unit and surgical wards of University Hospital of Neiva were taken as a source of information. Taking a look at the period between January 1st and May 31st, 2011, 32 cases were found but only 22 out of the 32 fulfilled the records for the study. Age, main diagnoses, procedures performed until the age of 28 days, type of anesthesia administered and mortality in 7 d post surgery were taken into account.

Results: All patients received general anesthesia, 9 out of the 22 (40,9%) got inhaled¬ general anesthesia, 4 patients (18,18%) were balanced with remifentanil and 9 patients (40,9%) were balanced with caudal anesthesia. One case of endocarditis in a patient led central venous catheter insertion finally died at 6 days postoperatively, another patient who was hemodynamically unstable, anasarca, low output, oligoanuria and finally died at 72 postoperative hours. One

more patient died at 24 postoperative hours in a large deterioration of general condition, previously critical. Finally a death occurred in a patient with dysmorphism, necrosis and hemoperitoneum after 6 postoperative days. Six patients were preterm newborns (27,27%) and 2 (9,09%) out of the six died.

Conclusions: A high mortality (18,18%) was found in severely ill patients A performance of highly complex procedures for a general high complexity non pediatric hospital is observed. A poor record and file system is evident. This will generate an incentive to seek a self-registration and monitoring of patients under study to generate a database.

References

1 Benjamin F van der Griend, Nichole A Lister, Ian M McKenzie, Martin Nick, Philip G Ragg, Suzette J Sheppard, Andrew J Davidson. Postoperative Mortality in Children After 101,885. *Anesthetics at a Tertiary Pediatric Hospital Anesth Analg* 2011; **112**:1440–7.

2 Braz Gobbo Leandro, Gobbo Braz Danilo, Da Cruz Deyvid Santos, Fernandes Luciano Augusto, Pinheiro Módolo Norma Sueli, Braz Cerqueira José Reinaldo. Mortality In Anesthesia: A Systematic Review. *Clinics* 2009; **64**(10):999–1006.

3 Chan RPC Jr, Auler JOC Jr. Retrospective study of anesthetic deaths in the first 24 hours. Review of 82,641 anesthetics. *Rev Bras Anestesiol* 2002; **52**:719–27.

4 Jiménez Méndez E, Vidal Pineda Díaz M, González Guzmán M P. Indice De Mortalidad Pediátrica Asociada Con Anestesia Y Cirugía. Revisión De 56,358 Casos En El Hospital General Del Centro Médico La Raza. *Fed Mex Col Anest Rev* 1997 Oct; **9**(5).

5 Cohen MM, Cameron CB, Duncan PG. Pediatric anesthesia morbidity and mortality in the perioperative period. *Anesth Analg* 1990; **70**:160–7.

Paper No: 269.00

Pre-operative airway assessment in pediatric patients

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Introduction: Several clinical criteria are being routinely used in adults, in order to identify patients with a difficult airway. This is essential in planning anesthetic management and endotracheal intubation. Several anatomical airway differences exist between adults and children. There is very scant literature available which relates to pre-operative airway assessment in pediatrics and its relationship to difficult intubation.

Objective:

- To assess the following variables i.e., age, gender, body mass index (BMI) and body weight, Mallampati classification and thyromental distance in two groups of pediatric patients (pre-school; less than 5years and school going; more than 5years) pre-operatively and correlate these to the different grades of Cormack and Lehane classification observed at the time of laryngoscopy.
- Evaluate the relationship between distance from nares to tragus with the different grades of Cortmack and Lehane classification.

Material and Method: This quasi experimental study was performed at Aga Khan University Hospital, Karachi, after approval from the ethical committee. One hundred and ninety six pediatric patients, age range between infant to eight years and ASA I and II grade undergoing elective surgery under general anaesthesia with planned endotracheal intubation were included. Demographic and clinical measurements like age, sex, weight (kg), Body Mass Index (BMI), distance between tragus to nares (cm), Mallampati grades and thyromental distance (cm) were noted. Relationship of these variables with Cormack and Lehane grading at the time of laryngoscopy was recorded. All tracheal intubations were done by one author.

Results: Cormack and Lehane grades 2 and 3 was observed in 22% of children $<$ 5years as compared 02% of children $>$ 5 years ($p < 0.001$). In children $<$ 5 years increasing grade (2&3) of Cormack and Lehane classification was seen with decreasing tragus to nares distance ($p < 0.002$) but this trend was not observed in older children. A similar trend was observed with thyromental distance in children $<$ 5 years (p 0.025) and $>$ 5 years (p 0.02). There was no significant relationship seen for Cormack and Lehane classification with respect to gender, body mass index (BMI) and distance between tragus to nares for children 5 years and above.

Conclusion: We conclude that thyromental distance (Tm), distance between tragus to nares (Tn) can be helpful in assessment of difficult airway in pediatric patients younger than 5years of age. Further studies are required on larger sample size.

References

1 Kopp VJ, Bailey A, Valley RD, *et al.* Utility of the Mallampati classification for predicting intubation in pediatric patients. *Anesthesiology* 1995; **83**:A1147.

2 Samsoon GLT, Young JRB: Difficult tracheal intubation: A retrospective study. *Anaesthesia* 1987;**42**:487–490.

Paper No: 290.00

Previous exposure to anesthesia and autism spectrum disorder (ASD): a puerto rican population-based cohort study

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Introduction: Autism Spectrum Disorder (ASD) is characterized by impaired social interaction and communication, and by restricted and repetitive behavior, that begins before a child is three years old.(1) Researchers have shown that prevalence rates in the U.S. may be as high as 91 in 10,000. As many as 1.5 million people in U.S. may have some form of autism.(2) A number of studies have examined the effects of early exposure to anesthesia on brain development and subsequent impairment in neurocognitive function; yet, little is known about the possible effects of anesthetic agents on social-behavioral functioning.
Objectives: To identify if children who had previous exposure to anesthesia either during their developing brain years or later are at risk of developing autism and its severe form of the disease.
Methods: Data was obtained from structured interviews administered to a sample of 514 parents/guardians distributed in two groups: ASD = 262 children diagnosed with this condition and Non-ASD: 253 children (siblings of ASD group) without diagnosis (95% confidence interval) that freely decided to participate and agreed to a consent form. Variables studied include: demographics, diagnosis and severity of ASD, exposure to anesthesia, and age of exposure. Children less than 2 years of age are considered to have developing brain. Data was analyzed using Chi-square or Fisher exact test.
Results: In contrast to non-ASD group, most of the children within ASD group were male, 74% ($n = 193$, $p = 0.0001$). Of the 262 ASD patients, 99 had exposure to anesthetics before their diagnosis while in Non-ASD population, 110 had exposure to anesthesia, demonstrating no statistically significant association between both groups ($p = 0.2091$). Out of 99 ASD patients exposed to anesthesia prior to their diagnosis, 72 were exposed before age 2. When compared to the 110 Non-ASD patients exposed to anesthesia, 86 had exposure during this developing brain period, which indicates no statistically significant association ($p = 0.4207$). In addition, most of the ASD children exposed to anesthesia before diagnosis were diagnosed with mild degree of the disease when compared to ASD children without any previous exposure to anesthesia ($p = 0.9700$). When the exposure occurred before age 2, ASD children developed mild form of the disease as compared with ASD children without any previous exposure to anesthesia ($p = 0.1699$).
Conclusions: Early exposure to anesthesia in children, including during the brain development period, does not increase the probability to develop neither ASD nor severe form of the disease.

References

1 O'Brien G, Pearson J. Autism and learning disability. *Autism* 2004; **8**:125–40.
2 Shattuck PT, Durkin M, Maenner M, *et al.* Timing of identification among children with an autism spectrum disorder: findings from a population-based surveillance study. *J Am Acad Child Adolesc Psychiatry* 2009; **48**:474–83.

Paper No: 291.00

Assessment of postoperative vomiting in retinoblastoma patients and their siblings undergoing eye exams under anesthesia

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Introduction: Post operative vomiting (POV) in children is one of the leading causes of delayed discharge and readmission to the hospital. Most pediatric patients cannot voice a feeling of nausea and risk factors have been associated with POV (1).
Objectives: The purpose of this study was to evaluate the incidence of emesis in the PACU in pediatric patients undergoing eye exams of minimal stimulation under anesthesia.
Methods: We analyzed data from ophthalmologic procedures that did not involve a surgical incision, laser, and cryotherapy from our Automated Anesthesia Information System. Between January 2006 and July 2010 we found 76 patients with a diagnosis of or need for screening for retinoblastoma. Our endpoint was administration of an antiemetic or the documentation of emesis in the PACU. Descriptive statistics were used in data analysis.
Results: Sixty-three percent of patients received prophylactic anti-emetics: 40/76 (53%) received ondansetron alone, 6/76 (8 %) received both ondansetron and dexamethasone, and 2/76 (2.6%) patients received dexamethasone alone. The overall incidence of emesis in this study group was 1.3% (1/76 patients). The incidence of emesis in the group of patients receiving anti-emetics and those not receiving anti-emetics was 0% and 3% respectively
Conclusion: In our study where identified risk factors were present but with essentially no surgical stimulation the incidence of POV in the PACU was lower than the baseline of 9% with no risk factors2. However, the discomfort associated with POV may justify prophylactic anti-emetic administration.

References

1 Gan TJ, *et al.* Society for Ambulatory Anesthesia Guidelines for the Management of Postoperative Nausea and Vomiting. *Anesthesia & Analgesia* 2007;**105**(6), 1615–1628.

Paper No: 295.00

The Comparison of Intravenous Magnesium Sulfate and Lidocaine to Prevent Laryngospasm after Tonsillectomy and/or Adenoidectomy

Elaheh Allahyary and **Shoja-ul-hagh Taregh**

Introduction: Complications following extubation remain an important risk factor in anesthesia. Laryngospasm is the

most common cause of upper airway obstruction after tracheal extubation. It is particularly frequent in children after oropharngeal surgeries like adenotonsillectomy (1-2). Several studies focused on prevention of laryngospasm (3-7). The role of lidocaine in preventing post extubation laryngospasm and stridor has been contemplated by previous researches (3). Magnesium, the fourth most common cation in the body, has been the recent focus of much clinical and scholarly interest.

Objectives: In this study we sought to assess the hypothesis that magnesium sulfate will reduce the incidence of post extubation laryngospasm and to compare it with intravenous lidocaine.

Methods: 185 children with ASA physical status I and II, aged 3-16 years, scheduled to undergo elective tonsillectomy and/or adenoidectomy under standard general anesthesia were enrolled in this double blinded study. All patients randomly entered to three groups to receive equal volumes of medication or placebo at two distinct times, first 2 minutes after intubation and second, just before extubation. The patients received normal saline and lidocaine 1 mg.kg-1 in lidocaine group, magnesium sulfate 15mg.kg-1 and normal saline in magnesium group and normal saline in both mentioned times in control group. Deep extubation was carried out in all the patients at the end of operation and the incidence of laryngospasm were observed and recorded until the time of discharge from the post anesthesia care unit.

Results: Both magnesium and lidocaine groups revealed less laryngospasm than the control group (PV = 0.008 and 0.001 respectively), and no difference was found between magnesium and lidocaine groups regarding laryngospasm (PV = 0.493). The plasma magnesium concentrations were significantly higher in magnesium group than two another groups (PV = 0.0001), but were not more than 2.5 mmol.l-1.

Conclusions: Magnesium sulfate can reduce the incidence of post operative laryngospasm as well as intravenous lidocaine in pediatric patients undergoing adenotonsillectomy surgery.

References

1 Asai T, Koga K, Vaughan RS. Respiratory complications associated with tracheal intubation and extubation. *Br J Anesth* 1998; **80**: 767–775.

2 Haghberg C, Georgi R, Krier C. Complications of managing the airway. *Best Practice & Research Clinical Anesthesiology* 2005; **19**(4): 641–659.

3 Staffel JG, Weissler MC, Tyler EP, *et al.* The prevention of postoperative stridor and laryngospasm with topical lidocaine. *Arch Otolaryngol Head Neck Surg* 1991; **117**: 1123–1128.

4 Kumar Batra Y, Ivanova M, Shujat Ali S, *et al.* The efficacy of a subhypnotic dose of propofol in preventing laryngospasm following tonsillectomy and adenoidectomy in children. *Pediatric Anesthesia* 2005; **15**: 1094–1098.

5 Schulz-Stubner S, Wettmann G, Reyle-Hahn SM, *et al.* Magnesium as part of balanced general anesthesia with propofol, remifentanil and mivacorium: a double-blind, randomized prospective study in 50 patients. *Eur J Anaesthesiol* 2001; **18**(11): 723–729.

6 Okayama H, Aikawa T, Okayama M, *et al.* Bronchodilating effect of intravenous magnesium sulfate in bronchial asthma. *Ann Emerg Med* 2000; **36**(3): 181–190.

7 Rowe BH, Bretzlaff JA, Bourdon C, *et al.* Intravenous magnesium sulfate treatment for acute asthma in the emergency department: A systemic review of the literature. *Ann Emerg Med* 2001; **37**(5): 552–553.

Paper No: 312.00

Risk of laryngospasm and bronchospasm with the Laryngeal mask airway compared to endotracheal intubation in neonates less than six months of age: A retrospective study of 4,173 patients

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Intoduction: Though the laryngeal mask airway (LMA) has been validated as an effective means of providing ventilation during neonatal resuscitation (1), the routine use of LMAs for elective surgery in infants remains controversial.

Objective: To date, there have been no studies comparing the frequency of airway complications with LMA versus endotracheal intubation (ETT) in neonates undergoing elective surgery.

Methods: We performed a retrospective analysis to determine the incidence of laryngospasm and bronchospasm with LMA and ETT in infants less than 6 months of age. All the anesthetic records from June 2003 to June 2010 at Childrens Hospital Los Angeles were screened. After inclusion and exclusion criteria were applied, a total of 4,173 cases remained for analysis. Data extracted included demographic information, case information, written comments, and the use of medications common in the treatment of laryngospasm and bronchospasm. Vecuronium 0.1 mg/ Kg was administred for endotracheal intubation for the ETT group. Three independent investigators reviewed records which had yielded positive results. Comparison of categorical data between ETT and LMA groups was made using the chi-square test or Fishers exact test if data contained sample sizes less than six. Analysis of continuous data between the two groups was made with the Wilcoxon rank-sum test.

Results: Of 4,173 total cases, 3,418 anesthetics were administered using an ETT, while 755 cases utilized a LMA.The LMA group was found to be older, heavier, and healthier than the ETT group. The incidence of laryngospasm was 1.7% in the LMA group and 0.7% in the ETT group ($p < 0.05$), and the incidence of bronchospasm was 0.4% in the LMA group and 0.5% in the ETT group ($p < 0.05$) which is not statstically significant. Our study is the first to compare the incidence of airway complications with LMA versus ETT in the neonatal population. The increased risk of laryngospasm when using LMAs in neonates may be secondary to difficulty with proper positioning of smaller sized LMAs (2).

Conclusios: Though overall complication rates are low, the results from this study suggest that the anesthesiologist should have a heightened awareness to possible intraoperative problems when LMAs are used in small infants.

References

1 Grein AJ, Weiner GM. Laryngeal mask airway versus bag-mask ventilation or endotracheal intubation for neonatal resuscitation. *Cochrane Database Syst Rev*. 2005 Apr **18**;(2):CD003314.

2 Von Ungern-Sternberg BS, Wallace CJ, Sticks S, Erb TO, Chambers NA. Fibreoptic assessment of paediatric sized laryngeal mask airways. *Anaesth Intensive Care*. 2010 Jan; **38**(1):50–4.

Paper No: 338.00

A Comparative Study of Fentanyl and Alfentanyl in maintaining hemodynamic cardiovascular stability among Chinese Pediatric Patients undergoing general anaesthesia

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Introduction: Fentanyl,an opioid anesthetic with strong agonist action at μ-opioid receptors is widely used among children for various surgical procedures. Tracheal intubation in children is usually linked with a temporary hemodynamic cardiovascular response. Fentanyl group of opioids usually attenuate the cardiovascular intubation response,when used in small doses. Alfentanyl,an analogue of fentanyl with around 1/10 potency tends to cause less cardiovascular complications than other similar drugs such as fentanyl and remifentanyl.
Objectives: Aim of this study was to evaluate the efficacy of fentanyl and alfentanyl in relation to hemodynamic stability of Chinese pediatric patients during routine general anesthesia and mutually compare while assessing the cardiovascular intubation response.
Methods: A prospective clinical trial was conducted at Anesthesia department of Tongji Medical College allied hospitals, Wuhan, China from June2010 till December2010.48 children,aged 8.5 ± 1.7years, ASA?-??,undergoing general anesthesia were recruited. They were randomly divided in two groups. Group A (24n) received fentanyl 1.5 μg/kg while group B (24n) received alfentanyl 1.5 μg/kg bolus injections. Induction was done by 2mg/kg propofol slowly.100% pure oxygen was provided initially and rocuronium was given for tracheal intubation with laryngoscope. Lungs were mechanically ventilated with a mixture of 60%(NO)nitrous oxide and(O2)oxygen along with 1%isoflurane at a flow of 3 L/min. Hemodynamic parameters in terms of blood pressure and pulse were recorded before and after intubation. Participants with known allergy,respiratory infections,airway complaints and gastric reflux were excluded from the study. All the statistical analyses were performed by using SPSS version15 and a P-value of less than 0.05 was considered significant.
Results: There were no statistical differences among the gender,age and BMI of the participants between the two groups. Time to reach maximum systolic BP (49 ± 18sec vs. 74 ± 30sec, 95%CI 1.542-2.781, P 0.02) and pulse (52 ± 34sec vs. 108 ± 48, 95%CI 3.176-4.965, P 0.01) among group A was statistically significant and smaller than groupB participants. In addition, time for systolic BP (122 ± 47sec vs.76 ± 44, 95%CI 2.987-4.743, P 0.01) and pulse (128 ± 32sec vs. 57 ± 22, 95%CI 3.126-5.102, P 0.01)to reach normal were also statistically significant among the two groups with being the higher values in group A.Pre-intubation, post-intubation, average (intra-operative)and maximal (peak value) of pulse, systolic and diastolic BP were all statistically significant ($P < 0.05$) among the participants of the two groups reflecting that alfentanyl keeps the undergoing subjects more hemodynamically stable.
Conclusion: Alfentanyl group participants showed decreased values of pulse and blood pressures changes even with their peak values in comparison to the participants in Fentanyl group,despite same doses were given. There were minimal alterations in hemodynamic readings in the alfentanyl group,if compared with fentanyl received patients. An alfentanyl 1.5-2 μg/kg bolus injection dose alongwith propofol in children provides a safe circulatory and hemodynamic balance with minimal cardiovascular response and a stable anesthetic state.

Paper No: 351.00

The induction of anesthesia with sevoflurane in pediatric neurosurgical patients with intracranial hypertension

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Introduction and objectives: The choice of anesthetic is important to provide stable intracranial pressure and auto regulation of brain circulation during changing of system homodynamic and PaCO2 and prevent seizures.
Methods: We have analyzed the induction of anesthesia in 34 neurosurgical patients with intracranial hypertension (14 patients aged 1-12 months with hydrocephaly, 20 patients from 1 to15 years with brain tumors of different localization including posterior cranial fosse and also with hydrocephaly). The induction of anesthesia started with sevoflurane (8%)

before the venous catheterization. MAC of sevofluran was reached in 30-40 sec. Then all the patients received fentanyl (5 mcg/kg), clophelin (1,4mcg/kg), and Rocuronium bromide (0,6mg/kg) which was followed by orotracheal intubation.
Results: No patients developed coughing and psychomotor excitement. We observed no cases of increasing blood pressure during intubation. Total anesthesia was provided by fentanyl (2, 5 mcg/kg), clophelin (0,5mcg/kg), sevofluran 2, 5 vol. %. The condition of the brain was stable and comfortable for surgeons.
Conclusions: The method of bolus induction of anesthesia with sevoflurane (8%) together with fentanyl (5 mcg/kg) and clophelin (1,4mcg/kg) and non-depolarizing myorelaxant could prevent undesirable effects(coughing and psychomotor excitement) which lead to increasing of intracranial pressure and could provide level of neurovegetative stabilization deep enough to escape the increasing of blood pressure during intubation. The decreasing of arterial blood pressure after the induction of anesthesia (about 25% from preoperative level) do not cause harmful effects on the intraoperational condition of the brain.

Paper No: 383.00

Subclavian vein cannulation in neonates and children:analysis of 272 patients

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Introduction and Objectives: The cannulation of a central vein allows administration of large volumes of fluids in short times and at high osmolarities for rehydration, volume replacement, chemotherapy and parenteral nutrition. Percutaneous central venous line insertion has replaced peripheral venous cutdown as the primary mode of short term venous access in children.
Methods: 272 subclavian vein cannulations in neonates and children up to 8 years old were analyzed regarding successful first attempt for catheterization and early complication rates after the procedure retrospectively.
Results: We had 84 newborn patients (first 28 days of life) in our study population. In this group, 54 cannulations (64.2%) were successful in first attempt, 1 patient (1.2%) were complicated with pneumothorax, in 24 cases (28.5%) guide wires became ruined and only in 4 cases (4.8%) attempts to cannulation were failed. Appropriate size venous cannulas were not accessible, so arterial lines were applied in all neonates. In the remaining 188 patients, 1 month to 8 years old, only 1 attempt to cannulation of subclavian vein (0.5%) was failed and in 172 cases (91.4%) cannulation performed successfully at first attempt.
Discussion and Conclusion: Cannulation of central vein in neonates and children in a skilled hand, would be performed with great success rate and low early complications.

Paper No: 385.00

Spanish Video in Anesthesia as an Uncertainty and Anxiety Reducer Tool in Spanish Speaking Parents

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Introduction: Parents experience anxiety when their children undergo anesthesia. Lack of risk information prior to surgery create parental stress and anxiety. 1 Parental uncertainty is associated with anxiety. 2 Prior anesthesia knowledge should reduce parental anxiety. Our study shows that Hispanic parents who viewed a Pre-Anesthesia Spanish video have decreased anxiety.
Objective: We hypothesize that showing parents a Spanish video on the risks and benefits of anesthesia within two weeks prior to surgery will reduce parental anxiety.
Methods: Subjects were randomized into two study groups: 1) viewing the Pre-Anesthesia Spanish video or 2) not viewing the video. Both groups completed, before and again after viewing the videos, a Parent Perception of Uncertainty in Illness Scale (PPUS), a State Trait Anxiety Inventory Test (STAIT Y1, Y2) and the Amsterdam Preoperative Anxiety and Information Scale (APAIS). Parents repeated the same three tests before the operation on the day of the surgery. Parents also completed a satisfaction questionnaire after surgery.
Results: APAIS scores generally decreased in the parents exposed to the video. A significant statistical interaction indicates that the PPUS scores of those who watched the video changed in a different direction after intervention than did the scores in the control group. Separate within-group analyses do not yet show significant change over time, however, the divergence of responses is interesting. STAIT scores may be increasing more for the standard care group.
Conclusions: Hispanic parents who viewed a Pre-Anesthesia Spanish video had lower APAIS scores and lower anesthesia anxiety scores.

References

1 Zeev N, Kain MD, Shu Ming Wang, Lisa A, Caramico MD, Maura Hofstadter, Linda C, Mayes MD Parental Desire for Perioperative Information and Informed Consent: A Two-Phase Study. *Anesthesia & Analgesia* 1997; **84**:299–306.

2 Hoff AL, Mullins LL, Gillaspy SR, PageE MC, Van Pelt JC, Chaney JM An Intervention to Decrease Uncertainty and Distress Among

Parents of Children Newly Diagnosed With Diabetes. *Families, Systems, & Health* 2005; **23**:329–342.
3 Cassady JF, Wysocki TT, Miller KM, Cancel DD, Izenberg N Use of a Preanesthetic Video for Facilitation of Parental Education and Anxiolysis Before Pediatric Ambulatory Surgery. *Anesthesia & Analgesia* 1999; **88**:246–250.

Paper No: 417.00

Effect of 1.5% solution of succinic acid - "reamberin" on the antioxidant activity of plasma in post-anesthesia period in children

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Introduction: Hypoxia is not a rare complication of intra-and postoperative periods. It is an im-portant component of the free radical oxidation activation. For the prevention and reduction of oxidative stress study and application of topical agents with antioxidant properties include a salt of succinic acid (succinate). One of the preparations containing succinate, a 1.5% solution for infusion Â«ReamberinÂ», produced by OOO "NTFF" POLYSAN " Russia, consisting of active substances - sodium salt of N-metilglyukaminovaya succinic acid and trace elements.
Objectives: The drug was originally registered "Reamberin" in Russia in 1999, then - registered and successfully applied in Ukraine, Belarus, Kazakhstan, Georgia, Uzbekistan, Laos, Vietnam, Kombodzhe, Burma. More than 30 million patients were treated with this drug for 12 years. The study of the antioxidant activity of 1.5% solution for infusion Â«ReamberinÂ» in serum in children in post-anesthesia period using the method of chemiluminescence. This is 3b phase of clinical trial of the drug has received approval of the local ethics committee.
Methods: Eleven children aged 6-14 years operated under general intravenous anesthesia (fentanyl+propofol+ rocuronium bromid) were included into the study. Reamberin was administered for 2 min at the dose of 4 ml / kg 10 min before applying the last stitch on the skin. Antioxidant activity of serum was determined before the Reamberin, 2-3 min and 10 min after its introduction by the chemiluminescence method (HL).
Results: Application of 0.5 ml of â€œReamberinâ€, 1.0 ml and 1.5 ml in vitro was accompanied by dose-dependent increase of the antioxidant activity of the drug. For 2-3 minutes after the "Reamberin" introduction duration of the latent period (T/T0) HL declining in all the patients, that characterized the ability of the intercept free radicals and eliminate them from the system. The intensity of the slow luminescence (I/I0) (amplitude HL) remained practically unchanged. This indicated not highly active interception of free radicals in the system. At 10 minutes after drug administration T/T0 HL in 9 patients returned to their original performance or increased. In 1 patient T/T0 HL continued to decline. Taking the values of estimated parameters before the â€œReamberinâ€ 100%, after its introduction, to get T/T0 - 85,46 Â± 15,3 ($p < 0.05$) and 103,94 Â± 19,5 ($p < 0.05$), and for I/I0 - 100,8 Â± 12,9 and 99,42 Â± 12,2, respectively, 2-3 and 10 minutes. These results suggest that the main effect of "Reamberin" on the parameters of HL, accompanying the peroxidation of membrane lipids of liposomes is presented by the change of T/T0, which is influenced by the concentration of Fe2+[6].
Conclusions: Solution "Reamberin" has dose-dependent short antioxidant effect due to oxidation of the catalytically active ferrous ions and inhibiting the initiation stage of free radical reactions of lipid peroxidation in serum in children in post-anesthesia period.

Paper No: 420.00

Incidence of convulsive movements during inhalation induction with sevoflurane

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Introduction: Mask induction with sevoflurane has been associated with epileptiform changes of the EEG and sometimes localized and generalized tonic-clonic movements (1,2,3). Haga (4) reported a 6% incidence of convulsions during induction with sevoflurane in children.
Objectives: To determine the incidence rate of convulsive movements during the induction of anesthesia with sevoflurane and its associated factors.
Methods: From march 1st to july 31st 2011, we asked to the anesthesiologists of our institution to watch the occurrence of tonic-clonic movements during sevoflurane induction, after the loss of eyelash reflex and before the injection of intravenous drugs. The sample size was calculated in 400 patients to obtain a 95% confidence interval with an error lesser than 2.5%.
Results: We obtain data from 404 patients with a median age of 4 years old (range 2 days to 16 years old), predominantly males (62%) and ASA physical status I (80%). The maximal vaporizer concentrations of sevoflurane reached were 8% (median). The incidence rate of convulsions was 3.5%, they occurred at normoxemia and hypercapnia, were mostly localized (13 de 14 cases) and more frequent in females (Odds ratio = 3.1;95% CI = 1.01-9.39, $p = 0.047$). The incidence rate of convulsive movements during induction with sevoflurane was 3.5%; 95% CI: 1.9 - 5.8%.

Conclusions: The incidence rate of convulsions during mask induction with sevoflurane was 3.5% and associated to female sex.

References

1 Yli-Hankala A, *et al.* Epileptiform electroencephalogram during mask induction of anesthesia with Sevoflurane. *Anesthesiology* 1999, **91**: 1596–1603.

2 Vakkuri A, *et al.* Sevoflurane mask induction of anesthesia is associated with epileptiforme EEG in children. *Acta Anaesthesiol Scand* 2001; **45**:805–11.

3 Vakkuri A, *et al.* Epileptiform EEG during Sevoflurane mask induction: effect of delaying the Honest of hyperventilation. *Acta anaesth Scand* 2000, **44**:713–9.

4 Haga S, *et al.* Anesthetic induction of children with high concentrations of Sevoflurane. *Masui* 1992, **41**: 1951–5. (Article in japanese, only english abstract).

Paper No: 437.00

Application sugammadex in children

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Introduction: Used to date anticholinesterase drugs does not possess a yield sufficient effectiveness in postoperative residual curarization (PORC). The appearance of selectively-binding relaxant drug, sugammadex, should be able to solve this problem. Experience of using this drug in children is not sufficient.
Objective: Evaluate the selective relaxant first-binding drug, sugammadex clinical efficacy in children.
Methods: We examined 30 children aged 3 to 15 years (weight 14-45 kg, height 97-166 cm) with oncology in ASA II-III. Induction of anesthesia was performed i.v. bolus - propofol 2.5mg/kg, fentanyl 5mcg/kg, rocuronium 0.6mg/kg, maintaining a constant anesthetic i.v. infusion - propofol 6mg/kg/h, fentanyl 3,0mg/kg/h, rocuronium 0.6mg/kg/h. Duration of anesthesia 120-165 min. Fentanyl was discontinued for 20-30 minutes until the introduction of anesthesia sugammadex 4mg/kg administered on the basis of TOF in 10 patients, PTS 1-2, and 2mg/kg, T2, in 20 patients with the simultaneous termination of administration of propofol and rocuronium. Evaluated arterial BP, HR, SatO2, etCO2, NMB (TOF-Watch SX), the sedation depth (A-2000XP(Aspect Medical)).
Results: After the introduction of sugammadex 4mg/kg in 2 cases the value of TOF has increased to 100% after 45 seconds, in 4 cases - up to 99% after 75 seconds and in 4 children was greater than 90% after 1,5 minutes. In this group the mean of restoration of neuromuscular conduction to the level of TOF 90% or more occurred in 75 seconds. The recovery of neuromuscular conductivity to a level more than 90% showed an average of 115 seconds after sugammadex 2mg/kg introduction. The dynamics of BIS-index indicated the change rate of 26.5% in its increase direction in the 1st minute of the level before the introduction of sugammadex further to 46% on the 3d and 67.7% in the 5th minute. By this time, all the patients recovered consciousness, and the BIS-index was higher 80. Hemodynamic data did not undergo significant changes after the introduction of sugammadex. EtCO2 values and SatO2 testified about the adequacy of spontaneous ventilation is 120 seconds from the moment of sugammadex introduction in all patients. There were no adverse effects when using this drug. In neither case violations were fixed within 2 hours after sugammadex administration, which could be due to PORC.
Conclusion: Sugammadex 2mg/kg and 4mg/kg in children provides an effective and rapid elimination of neuromuscular block in the values of TOF T2 and PTS 1-2 respectively.

Paper No: 443.00

Tramadol versus Bupivacaine in the penile nerve block for circumcision

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Introduction: Penile nerve block is a common procedure and can provide effective analgesia during circumcision.
Objectives: to compare the quality of analgesia provided by Tramadol versus Bupivacaine administered in penile nerve block.
Material and Methods: After approval of the ethic committee and parental consent, we conducted a prospective randomized double-blind study in ASA1 children proposed for circumcision under general anesthesia with sevoflurane associated with a penile block. 2 Groups: a penile block with Bupivacaine 0.5% at 1mg/kg (Group 1) or penile block with Tramadol 2mg/kg (Group 2). The injected solutions were prepared for a total dose of 0.2ml/kg. The quality of analgesia in per procedure was assessed by the kinetics of heart rate. The duration of analgesia and use of additional analgesic (Paracetamol) was noted until the 12th postoperative hours. Postoperative pain was evaluated by the OPS score (1) on wake up, 30 minutes, 60 minutes and 12 hours in postoperative. The study of adverse events was focused on the occurrence of postoperative nausea vomiting, the allergic incidents, the incidence of hematoma at the puncture, sedation and respiratory depression.
Results: We have included 80 patients (40 patients in each group). The two groups were comparable: age (3 ± 1 in the 2 groups) and duration of circumcision (13.6 ± 4.6 minutes vs 13.8 ± 4.2, Group 1 vs group 2, respectively). There is no significant difference in the hemodynamic response to

incision but analgesia was higher in group 1 with a significant difference in heart rate at 5 and 10 min. We found no significant difference in the OPS score on awakening ($p = 0.22$) at 30 min ($p = 1$) and one hour ($p = 1$). The addition of complement analgesia with Paracetamol before the 12th hour was similar in the 2 groups (20% in the 2 groups, $p > 0.05$). Three patients in the tramadol group had nausea,vomiting with not significant differences. ($P = 0.24$). No cases of respiratory depression, sedation or allergic reactions were noted on 80 patients. One hematoma was noted in the tramdol group

Discussion: Postoperative analgesia provided by Tramadol in the penile nerve block for circumcision is comparable to that of Bupivacaine. The superiority of Bupivacaine regarding intraoperative analgesia can be explained by more delayed effects of Tramadol which joins the study that used tramadol only by a caudal block for inguinal hernia repair at the same dose (2mg/Kg)(2). The results of our study are in favor of an effect of Tramadol in the penile block avoiding adverse cardiovascular effects of Bupivacaine.

References

1 Anesthesiology. 1988; **69**: A770.
2 Paediatr. Anaesth. 2010, **20**: 524-529.

Paper No: 453.00

Secondary spread of caudal blockade as assessed by ultrasonography

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Introduction: Redistribution and secondary spread following the initial injection of local anaesthetics (LA) are important factors that contribute to the final spread of caudal blockade in children. However, to date these phenomena has yet not been studied in detail.

Objectives: The aim of this observational study was to define patterns of secondary spread and redistribution of a caudal block by means of real-time ultrasonography scanning and cutaneous testing.

Methods: Ultrasound assessment of LA spread within the caudal-epidural space as well as epidural pressure was followed during 15 minutes after initial injection (1.5 ml kg-1, ropivacaine 0.2 %) in 16 infants having elective inguinal hernia repair. At 15 minutes post-injection cutaneous testing was also performed to assess the cranial dermatomal level of the block (at end-tidal sevoflurane 2.5 %).

Results: Ultrasound-assessed cranial spread was Th10 and Th8 at 0 and 15 minutes, respectively, and sensory level at 15 minutes was Th4. The caudal injection was initially found to compress the terminal part of the dural sac, later followed by a partial reexpansion as epidural pressure was returning towards pre-injection values. An intrasegmental redistribution from the dorsal to the ventral compartment of the epidural space was also observed.

Discussion and Conclusion: Two separate patterns of secondary spread of caudal blockade could be observed; horizontal intrasegmental redistribution and longitudinal cranial spread. The bi-directional movement of cerebrospinal fluid observed (coined "the CSF rebound mechanism") does explain a major part of the difference between the initial ultrasound assessed cranial level and the final level determined by cutaneous testing.

References

1 Lundblad M, Lönnqvist P-A, Eksborg S, Marhofer P. Segmental distribution of high-volume caudal anesthesia in neonates, infants, and toddlers as assessed by ultrasonography. *Pediatr Anesth* 2011; **21**:121–17.
2 Brenner L, Marhofer P, Kettner SC, Willschke H, Machata A-M, Al-Zoraigi U, Lundblad M, Lönnqvist P-A . Ultrasound assessment of cranial spread during caudal blockade in children: the effect of different volumes of local anaesthetics. *Br J Anaesth* 2011; **107**(2): 229–35.
3 Thomas ML, Roebuck D, Yule C, Howard RF: The effect of volume of local anesthetic on the anatomic spread of caudal block in children aged 1-7 years. Pediatr Anesth 2010; **20**: 1017–21.
4 Stienstra R, Dahan A, Alhadi BZ, van Kleef JW, Burm AG: Mechanisms of action of an epidural topup in combined spinal epidural anesthesia. *Anesth Analg* 1996; **83**:382–6.

Paper No: 460.00

Comparison of two different methods of anaesthesia in children undergoing MRI

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Introduction: MRI in children has to be performed either under deep sedation or under general anaesthesia. Although many different methods of anaesthesia have been described comparative studies are scarce.

Objective: The goal of our study was to compare anaesthesia with Sevoflurane (group S) and anaesthesia with Remifentanil plus Propofol (group PR).

Method: 120 children aged 1 – 10 years, ASA physical status 1-2, were randomized to one of the 2 groups. The child's behavior before and after the anaesthesia, vital parameters, parents' satisfaction (with the induction and the immediate recovery period), the length of the stay in the recovery room and in the children's ward were registered. The children in the S group received Sevoflurane (1.3 MAC), had a

laryngeal mask placed and were breathing spontaneously. MAC, end-tidal Sevoflurane, end-tidal CO2 and respiratory rate were monitored. The PR group received an infusion of Propofol 50 mcg/kg/min and Remifentanil 0.06 mcg/kg/min and were breathing spontaneously too. A bi-nasal catheter was placed for administration of oxygen and monitoring end-tidal CO2 and respiratory rate.

Results: No patients were excluded. The children in the S group were more agitated at arrival to the MR room and more children in the PR group had more than one attempt of iv cannulation. Apart from this the 2 groups were comparable. In the PR group 15 children received one or more boluses of Propofol (and the infusion rate was increased) due to movements and in 8 others the infusion rate was increased due to insufficient anaesthesia. In the S group the Sevoflurane concentration was increased due to insufficient anaesthesia (changes in vital parameters) in 12 children. In the first 30 min in the recovery room more children were awake in the PR group than in the S group and in the first 45 min the children in the PR group had a better behavioral score than children in the S group. At 90 min more children in the S group than in the PR group were still in the recovery room and the children in the PR group were discharged earlier from hospital. Regarding parent satisfaction there was no difference between the two groups. No serious complications were experienced.

Conclusion: The Sevoflurane anaesthesia was the most reliable regime during the MRI. However, the Propofol/Remifentanil anaesthesia gave a significantly shorter hospital stay and a higher (better) behavioral score after the anaesthesia.

Paper No: 537.00

Usage of α1-adrenoreceptor antagonist urapidil for hemodynamic management during cardiopulmonary bypass in neonates

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Introduction: It is well known that the main problem hemodynamic management neonates during CPB is high level of SVR due to imperfection their vasoregulatory mechanisms. That is why there is a necessity to additional cooling for decreasing flow of CPB. Different kinds of vasodilators are employed to prevent high arterial pressure during CPB. The potent vasodilator Sodium Nitroprusside has same limitation due to its possibility to increase intracranial pressure. Many others medicines have mainly venodilatatory properties that results to the retention of water (that's why they can not be used in neonates for these purpose). Moreover intavenous anesthetics do not completely attenuate the stress response of surgery and CPB [1].

Objectives: The aim of this study was to assess the effectiveness α1-adrenoreceptor antagonist Urapidil [2] to hemodynamic management during CPB.

Methods: We compared two groups of neonates undergoing cardiac surgery with hypothermic CPB. Mean age was 5.8 ± 2.1 days, BSA 0.21 ± 0.02m2, t¤C during CPB – 27.2 ± 1.5¤C, time of ischemia was 65.8 ± 4.5min, time CPB – 84 ± 4 min; MUF had performed in 15% cases. In both groups anesthesia was induced with Sevorane® 1.7-2.1 MAC, rocuronium bromid 0.5-0.7mg kg-1; maintenance of anesthesia was 1.5-2.1 MAC Sevorane®; maintenance of anesthesia during CPB (200 ml/kg/min Terumo® Advanced Perfusion System 1) was 1.0-1.3 MAC Sevorane® and continuous infusion of Fenthanyl 3-10 μg kg-1h-1; Volatile anesthetic was delivered into oxygenator in composition of gas mixture. We used antegrade cardioplegia Custodiol® 40 ml/kg. In Urapidil group (n = 20) we used single bolus of α1-adrenoreceptor antagonist in dosage 1mg/kg at the beginning of CPB to maintain perfusion pressure within 35 mmHg. In control group (n = 25) it had achieved by continuos infusion of Sodium Nitroprusside and by additional boluses of Fenthanyl. We assessed the necessity and duration of inotrope therapy in postperfusion period, necessity in additional boluses of Fenthanyl or increases of it's dosage, determined the intraoperative BIS, hemodynamic profile, oxygen delivery and consumption, biochemical tests such as intra- and postoperative levels of glucose, lactate; extent of capillary leakage, time respiratory support, length of stay in the ICU.

Results: In Urapidil group the lactate level was 4.2 ± 2.3mmol/l vs. 6.15 ± 2.2 mmol/l ($p > 0.05$); glucose level was higher in control group 9.3 ± 2.4 mmol/l vs. 5.6 ± 1.5 mmol/l ($p < 0.05$). Time of respiratory support and length of stay in the ICU were lower in Urapidil group. Myocardial insufficiency was observed in both groups; delayed osteosynthesis was performed in 15% in each group.

Conclusion: Our results indicate that use of Urapidil during cardiopulmonary bypass permits easily achieve and montain the target level of perfusion pressure and, to avoid increasing dosage of Fenthanyl, reduce of time of respiratory support, length of stay in ICU. Usage Urapidil permits to avoid additional cooling during CPB and to perform same surgical repair in normothermia. Usage of Urapidil can be useful for heamodynacal management during CPB in neonates.

References

1 Gruber EM, Laussen PC, Casta A Stress response in infants undergoing cardiac surgery: A randomized study of fentanyl bolus, fentanyl infusion and, fentanyl-midazolam infusion. Anesth Analg. 2001;**92**:882-890.

2 Damage A.G. The mechanism of the sympathoinhibitory action of urapidil: role of 5-HT1A receptors. *Br. J. Pharmacol.* 1991; **102**(4): 998–1002.

Paper No: 555.00

Trapezius squeeze test as an indicator for depth of anaesthesia for lma insertion in children

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Introduction: Clinical tests like loss of verbal contact, eyelash reflex, corneal reflex, jaw relaxation etc are usually practised to assess the depth of anaesthesia. "Trapezius squeeze test"(TST) is another such clinical test. It is a simple test to perform in which one to two inches of trapezius muscle is held and squeezed in full thickness and response is evaluated in the form of toe / body movement.
Objectives: To assess the efficacy of trapezius squeeze test to indicate adequate depth of anaesthesia for LMA insertion in anaesthetised spontaneously breathing children.
Material & Methods: One hundred paediatric patients between 3-5 years of age, scheduled to undergo elective surgery were included in this study. We evaluated negative trapezius squeeze test as an indicator for optimal anaesthesia depth for LMA insertion in anaesthetised spontaneously breathing children. Anaesthesia was induced using 4% sevoflurane in oxygen. As the child lost the verbal contact or loss of body movement, TST was performed. Test was repeated every 15 seconds till it became negative. When child lost response to trapezius squeeze, a well lubricated, appropriate size LMA was inserted.
Results: Mean time for Trapezius Squeeze test to become negative in our study was 271.80 ± 55.8 seconds and ease of insertion was excellent in 91 and acceptable in 9 patients. LMA was successfully inserted in first attempt in 96% patients. No marked hemodynamic changes occurred in any child.
Conclusions: Negative trapezius squeeze test is a reliable end point which when used for placement of LMA in spontaneously breathing children provides excellent conditions for LMA placement in majority of the patients without any untoward effects.

References

1 Chang CH, Chang DJ, Kwon HH, Na SH, Shin YS. Optimal condition for LMA insertion can be determined by Trapezius squeezing test in children. *J Clin Anesth*. 2008 Mar; **20**(2):99–102.

2 Zbinden AM, Maggiorini M, Felix SP, Lauber R, Thompson DA, Minder CE. Anaesthetic depth defined using multiple noxious stimuli during isoflurane/ oxygen anesthesia. *Anesthesiology* 1994; **80**(2): 253–60.

3 Becker KE. Plasma levels of thiopental necessary for anesthesia: Anesthesiology 1978; **49**: 192–6.

Paper No: 610.00

Assessment of acute postoperative pain in the pediatric population of a high complexity general hospital. Hospital Universitario Hernando Mocaleano Perdomo de Neiva – Colombia

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Introduction: Post surgery pain can be severe and its physical and psychological consequences can lengthen and worsen the basic illness. In our hospital there are no studies concerning the intensity and management of postoperative pain in children. Improvement programs can be implemented once the situation is identified.
Objectives: Describe postoperative pain intensity, medication and analgesic techniques used in post surgery children, so as to set the bases for the "Clinical Pediatric pain" program.
Method: Observation study of a suitable cohort of children under 13 years of age, carried out between October 2010 and February 2011. Observations in three instances: entering the Post anesthesia Care Unit (UCPA), leaving the UCPA and at 24 postoperative hours. Pain intensity was recorded by means of the Analog Visual Scale (EVA);numeric scale in patients over 7 years old and EVA of the face in younger children, recording the medication and analgesia techniques employed. The analysis was done using the Epi-info 3.5.1.
Results: Of the 175 children undergoing interventions, from 1 month to 12 years of age, average 6 years, a 23.7% recorded moderate to severe pain on entering the UCPA, 19% on leaving the UCPA, and an 11.2% after 24 hours. AINES (69.2%) were the analgesics most commonly used, the most frequent were Dipirone (98.3%), followed by opiates (23.1%), Tramal was the most frequent (41%), followed by morphine (33.3%). All the patients were under basic general anesthesia. As transitional anesthesia in surgery rooms, an 8.1% received multimodal anesthesia, 24.4% local infiltration, 2.0% plexus blocking and 1.2% peridural blocking. No records of pain intensity were found in the clinical history of any patient. The highest pain frequency was found in children below 2 years of age, with 35.7%, 50.3% and 28.6% of pain perception on the three instances assessed. The specialties showing most interventions were Pediatric Surgery (44.6%), Orthopedics (24.6%) and Plastic Surgery (21.7%), for 91% of procedures.
Discussion and Conclusions: The management of postoperative pain in children is not adequate, as shown by the high occurrence of moderate to severe pain, under consumption of opiates (Morphine), and low transitional anesthesia

percentage, especially multimode anesthesia. It is necessary to implement a Clinic for the Management of Postoperative Pain in Children; this should include the use of pain assessment instruments, relevant for children under 2 years of age, whose pain intensity is perceived as being higher. It is necessary to record pain evolution in clinical histories.

Keywords: Postoperative pain; Pain in Children; Analgesia

References

1 Berde C, Sethna N. Analgesics for the treatment of pain in children. *The New England Journal of Medicine*, 2002; **347**: 1094–1103.
2 Brislin RP, Rose JB. Pediatric Acute Pain Management. *Anesthesiology Clinics of North America*, 2005; **23**:789–814.
3 Verghese ST, Hannallah RS. Postoperative Pain Management in Children. *Anesthesiology Clinics of North America*, 2005; **23**:163–184.
4 Reyes Duque Gustavo. Anesthesiology Pediatric: Management of postoperative pain in pediatric surgery. Colombian Society of Pediatric Surgery. 2003.

Paper No: 611.00

Pleuropulmonar pediatric surgery mortality at the high complexity general hospitalcenter of Neiva – Colombia –2010

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Introduction: At present thorax pathological surgery in children covers a wide spectrum; it includes infectious diseases, congenital conditions, trauma and cancer. This is possible thanks to scientific progress (risk stratification, surgical techniques, anesthesiology techniques, pain management and ICU management) and technological advances video thoracoscopy, bronchial blocking and mechanical ventilation. The Hospital Universitario Hernando Moncaleano Perdomo de Neiva is an institution that takes care of all kinds of pathologies and patients (General Hospital) with limited economic resources. As pleuropulmonary surgery is carried out in children it is therefore important to know our mortality statistics. The 2010 databases were revised to gather basic epidemiology data of the pediatric patients who had undergone thoracic surgery on lung and pleura, as a basis to improve care and carry out further research.
Objectives: Determine mortality on day 28 and basic epidemiological aspects of patients of less than 12 years of age undergoing thorax surgery at the HOSPITAL UNIVERSITARION DE NEIVA HERNANDO MONCALEANO PERDOMO, of Neiva-Colombia, during the period from January 1st to December 31st, 2010.
Method: Retrospective observation study taking into account as secondary data sources the operating theater records, the statistics service and the hospital mortality records. The analysis was done using Epi-info 3.2. Lung and pleura procedures were considered. Surgery on esophagus, trachea or persistent arterial ducts was not considered, due to deficiencies in the records.
Results: There were 24 pleuropulmonary pediatric surgery interventions during 2010: 92% of them (22 patients) were programmed and 8% (2 patients) were emergencies. The male/female ratio was 3:1. One patient (4.16%) died. Three procedures (12.5%) were endoscopic and 21 (87.5%) open (Thoracotomy). Five patients were taken to the Standard Post-Anesthesia Care Unit (20.8%) and 19 (79.2%) were taken to the Pediatric Intensive Care Unit. The most frequent procedure was lobectomy by thoracotomy (50%); most interventions were done in children 1 to 5 years old (54.16%).
Conclusions: Lung and pleura pediatric surgery shows high mortality (4.2%) and falls within that reported in the literature, it is much lower than that reported for the adult population (between 15% and 23%). Most of these procedures are carried out on patients having lung infection sequelae. Deficiencies were found in the hospital databases with under recording of activities, limiting the studies and epidemiological decision making.

References

1 Systematic classification of morbidity and mortality after thoracic surgery. Seely AJ, Ivanovic J, Threader J, Al-Hussaini A, Al-Shehab D, Ramsay T, Gilbert S, Maziak DE, Shamji FM, Sundaresan RS. Ann Thorac Surg. 2010 Sep;**90**(3):936-42; discussion 942.Department of Surgery, Division of Thoracic Surgery, University of Ottawa, the Ottawa Hospital, Ottawa, Ontario, Canada.
2 Valoración del riesgo quirúrgico en cirugía de tórax. Parámetros del riesgo quirúrgico. (Assessment of surgical risk in thoracic surgery. Surgical Risk Parameters.) Y.W. Pun. Servicio de Cirugía Torácica. Hospital Universitario de la Princesa. Madrid. España. Arch Bronconeumol 2004;**40** (Supl 5):33–7
3 An update on anesthesia for thoracoscopic surgery. Gregor y W. Fischer and Edmond CohenCurrent Opinion in Anaesth esiology 2010, **23**:7–1 1.

Paper No: 624.00

Resuscitation with Lipid or with Epinephrine in Levobupivacaine-Induced Cardiac Toxicity in Piglets

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Introduction: Lipid emulsion infusions are increasingly used in the treatment of local anesthetics cardiac toxicity. A newborn piglet model was developed to evaluate the effect

of lipid and epinephrine during cardiac arrest following levobupivacaine cardiac toxicity.
Methods: Thirty-three anesthetized, instrumented newborn pigs received lévobupivacaïne (2.5mg/ml) at the rate of 200 ml/h until collapse appeared. Collapse was defined by a decrease of the baseline MAP by 50% persisting for 15 consecutive seconds. The piglets underwent external cardiac massage and ventilation in oxygen in addition to study drugs.
Control group (CG): no additional drug, Lipid Group (LIP): lipid alone with an initial bolus of 4 ml/kg over 1 min followed by a continuous perfusion at the rate of 0.25 ml.kg-1.min-1.
Epinephrine Group (EPI): bolus of epinephrine 10 μg/kg every 3 min, Group EPI-LIP (combination of EPI+LIP). The resuscitation went on during 30 min or until the recovery of an efficient and stable cardiac activity defined by MAP upper than initial MAP, and normal sinus rhythm for 30 min.
Results: Survival rates were 1/7 in CG, 7/9 in LIP, 6/7 in EPI and 10/10 in EPI-LIP, respectively. The mortality was statistically different between CG and other groups but not significant between CG, LIP and EPI-LIP group. In the group EPI, the mean dose of epinephrine was 45.7 μg/kg and 12.7 μg/kg in the group EPI-LIP ($P < 0.001$). For survivors, the number of ECG abnormalities was 0 in LIP group, 14 in EPI group and 17 in EPI-LIP group ($P < 0.05$).
Conclusions: Lipid emulsions and epinephrine have a comparable efficacy on survival rate in this model of levobupivacaine-induced cardiac toxicity. However, epinephrine alone or its combination with lipid was associated with rhythmic or conduction cardiac disturbances.

References

1 Ludot H, Tharin JY, Belouadah M, Mazoit JX, Malinovsky JM. Successful resuscitation after ropivacaine and lidocaine-induced ventricular arrhythmia following posterior lumbar plexus block in a child. Anesth Analg. 2008;**106**(5):1572–4
2 Hiller DB, Gregorio GD, Ripper R, Kelly K, Massad M, Edelman L, Edelman G, Feinstein DL, Weinberg GL. Epinephrine impairs lipid resuscitation from bupivacaine overdose: a threshold effect. Anesthesiology. 2009 Sep;**111**(3):498–505.

Paper No: 663.00

Sodium Nitroprusside Is Not Associated with Metabolic Acidosis During Intraoperative Infusion in Children

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Introduction: Sodium nitroprusside (SNP) is a potent vasodilator with a rapid onset and offset. Due to its relative ease of titration, SNP may be a useful adjunct for the induction and maintenance of deliberate hypotension during major surgery. The metabolism of SNP results in the liberation of cyanide ions (CN-). Cyanide toxicity includes metabolic acidosis caused by interference with cellular energy metabolism. Data are limited confirming the relationship between SNP and metabolic acidosis during anesthesia. Nevertheless, the concern of toxicity has limited the use of SNP.
Objective: We performed a retrospective case-control study to determine whether the intraoperative use of SNP is associated with an increase in the incidence of metabolic acidosis in children.
Methods: Data from 179 children undergoing craniofacial and spinal fusion surgery between 2005 and 2010 at Lucile Packard Children's Hospital at Stanford were reviewed. Records from 60 patients who received SNP (Treatment Group) as part of a multicenter study (NO1-HD-4-3386) were compared with records from 119 patients who did not receive SNP (Control Group). Metabolic acidosis was defined as serum bicarbonate (HCO3) < 18.5 mEq/L and/or administration of HCO3 during anesthesia. The sample size in the Control Group was selected to achieve 80% power when testing noninferiority in the proportion of SNP patients with metabolic acidosis.
Results: Demographics, estimated blood loss, and total fluids administered in the two groups were similar. 19 (SE 32%) and 35 (SE 37%) children in the treatment and control groups, respectively, experienced metabolic acidosis. The 95% confidence interval for the difference between these proportions is (-21%, 11%).
Conclusion: The use of SNP has been limited because of the assumed association with metabolic acidosis. We found that administration of SNP for deliberate hypotension during major surgery is not associated with an increase in the incidence of metabolic acidosis.

Paper No: 670.00

Gastroschisis: surgery in life zero minute: anesthesiologists new challenges

Raul Daniel Trotta, **Virginia Funes**, and **Melina Yedro**

Introduction: the technique used for the perinatal treatment of gastroschisis, consists of the primary closure and without general anesthesia of the abdominal wall defect, with the support of fetal placental circulation in life zero minute. Two conditions are crucial: prenatal diagnosis before the 32 weeks, and no fetal associated malformations. The procedure is based on the fact that gastroschisis behaves like a big obstructed hernia which starts to strangulate in the last weeks of gestation. An elective caesarean section between weeks 34 to 36 and the use of this technique would encourage visceral return before

handles are modified by dilatating and becoming more rigid.
Objective: management of analgesic-sedation in four newborns carriers of gastroschisis . The four babies born by caesarean underwent the simil-exit technique for introduction of viscera to abdomen. Material and methods: caesarean is practised in all cases with subarachnoid anesthesia+ oxigen at 50% with mask. Neonatal analgesic sedation was performed through the mother using Remifentanil administered by TCI – there is no pharmacokinetics developed in pregnants. Loaded the data to the Base Primea (weight, age and height), infusion was started once the spinal analgesia was assured (Bupivacaine 8 mg+Fentanyl 20 micrograms). The starting dose was 0,05 mcgr/Kg/minute to get to 0,1 mcgr/Kg/minute, when patients said to feel quiet and sedated. The total length of infusion was between 15 and 17 minutes. Administration of the drug was suspended when the obstetrician found the beating of the cord had stopped. Results: At anesthesiologist level, the determination to use an intravenous opioid like Remifentanil in sedative doses on the mother was based on previous jobs by Kan and col, taking advantage of the drug pharmacokinetics because of its rapid metabolism by blood-esterases. We must add the high volumen of fetal distribution, which assures rapid distribution and plasma level fall below values that do not produce respiratory deppression after umbilical cord beating stops. TCI was also used; this allowed to administer the desired concentrations in the mother and to get the desired effect on the fetus, making it appear less reactive and with no evidence of pain, therefore, contributing to the facilitation of visceral return to abdomen.
Conclusions: The unnecessary endotracheal intubation during surgery plus the non-use of postoperative Mechanical Ventilation add a key prognosis element for this technique in improving the patients' evolution. The lack of complications related to the surgical technique, the very good analgesic sedation achieved in newborns, main goal of this work, and the good clinical outcome obtained add a new challenge to interdisciplinary groups proposed for the treatment of these patients in the search for new knowledge.

References

1 Anesthesiology, Volume 88 (6), June 1998, pp 1467-1474 Copyright: (C) 1998 American Society of Anesthesiologists, Inc. Intravenous Remifentanil: Placental Transfer, Maternal and Neonatal Effects)* -Claudia Gelsumino, Claudio Lalin, Miguel Angel Paladino. ¿Qué aporta de nuevo el uso del remifentanilo? 2006. República Argentina 2.

2 Comunicaciones Congresos SED 2006. -Minto CF, Schnider TW, Egan TD, Youngs E, Lemmens HJM, Gambus PL, Billard V, Hoke JF, Moore KHP, Hermann DJ, Muir KT, Mandema, J Shafer SL.

3 Influence of age and gender on the pharmacokinetics and pharmacodynamics of remifentanil. I Model development. Anesthesiology 1997a; **86**: 10-23.

Paper No: 688.00

The triangle made with the real sacral hiatus and PSISs is equilateral in children?

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Introduction: Caudal block is common regional block in pediatric anesthesia. The equilateral triangle located between sacral hiatus and posterior superior iliac spines (PSISs) is used in determining the location of the sacral hiatus as the conventional method. In this study, we assessed if the triangle made with the real site of sacral hiatus confirmed by ultrasonography and two PSIS is equilateral in children.
Objective: to confime if the triangle made with real sacral hiatus and PSISs is equilateral in children and if the shape of triangle is changed according to age.
Method: Children aged 0-72 months scheduled for undergoing inguinal herniorrhapy under general anesthesia with caudal block were enrolled. After induction of general anesthesia, the patients were placed in the left lateral decubitus position with full flexion of the hip joint for caudal block. The real site of sacral hiatus was confirmed by ultrasonography. The triangle between the real site of sacral hiatus and PSISs was drawn and then the angle of sacral hiatus in the triangle was measured.
Results: The distribution of the angle of sacral hiatus in triangle between the real site of sacral hiatus and PSISs was shown in Figure 1. The coefficients of Pearson¡s correlation among age, weight, and height with the distribution of the angle were -0.440, -0.445 and -0.434 ($p < 0.001$).
Conclusions: The triangle located between the sacral hiatus and PSISs was not an equilateral triangle in pediatric patients.

Paper No: 703.00

Anaesthetic management of scoliosis surgery in patients with Fontan circulation

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Introduction: Idiopathic scoliosis occurs in 2-3% of the general population (1). The association between congenital heart disease (CHD) and scoliosis is well studied (2,3). The Fontan procedure is the final stage to palliate a variety of complex cardiac congenital defects with functional single ventricles. The survival rates in these children have improved in the last two decades, so more patients with univentricular functional heart require scoliosis surgery.
Objectives: To present our experience with the anaesthetic management and perioperative care in patients with spinal scoliosis and a Fontan physiology.

Methods: We reviewed the medical records of seven patients with univentricular heart who had undergone surgical treatment for spinal deformity. Data were abstracted regarding cardiac history, major Cobb angle, type of spinal fusion, American Society of Anesthesiologists (ASA) score, New York Heart Association (NYHA) score, presence of cyanosis, cardiac and neurologic monitoring, anesthesia time, operative blood loss, transfusion requirements, perioperative complications, postoperative ventilation time, perioperative inotropic support, intensive care unit (ICU) stay and mortality.
Results: Mean age at surgery was 15 years 3 months, mean Cobb angle was 68°. The types of CHD were: 4 single ventricle, 2 double outlet ventricle with transposition of great vessels, and 1 pulmonary atresia. None of them had open fenestrations. Four patients were cyanotic. ASA score was III in six patients and IV in one. NYHA score ranged between I and III. All patients were instrumented with segmental instrumentation and allograft by posterior procedures. Spinal cord monitoring was used in all patients. Transoesophageal echocardiography was used in five patients. Anaesthesia time, postoperative ventilation time and ICU stay were respectively: 440 minutes (range 330 – 540); 7,1 hours (range 2 – 17); and 3,8 days (range 2 – 9). Perioperative mean blood loss was 2291ml (range 1000 – 2900). All patients were treated with antifibrinolytic drugs. Perioperative blood salvage was used in four patients. Transfusion requirements were: packed red blood cells 3,5 units (range 1-5); fresh frozen plasma 350 ml (range 0 – 800); platelet concentrates 67 ml (range 0 – 400). Perioperative complications were: 1 atrial fibrillation, 1 low cardiac output with pulmonary hypertension and 1 left pulmonary artery thrombosis. Three patients needed perioperative inotropic support. One patient died intraoperatively as a result of ventricular dysfunction that progressed to cardiac arrest.
Conclusions: Anaesthetic management and operative treatment of scoliosis in these patients may be successful. The priority is to maintain sufficient intravascular volume for adequate pulmonary blood flow and cardiac output. However, complications are frequent and significant.

References

1 Canale St, Jones L, Azar FM, *et al.* Campbelĺs Operative Orthopedics, 10th edn. St Louis, Mo: Mosby, 2003.
2 Kawakami N, Mimatsu K, Deguchi M, *et al.* Scoliosis and congenital heart disease. *Spine* 1995; **20**: 1252–1255.
3 Taggart NW, Shaughnessy WJ, Stans AA, *et al.* Outcomes of spinal fusion in children with congenital heart disease. *J Pediatr Orthop* 2010; **30**: 670–675.

Paper No: 731.00

Incidence of unplanned extubation in pediatric intensive care unit patients: a retrospective descriptive study

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Introduction and Objectives: Unplanned extubation (UE) is an infrequent but a potentially harmful complication in pediatric intensive care unit (PICU) patients. We planned this study to evaluate the incidence of UE in our PICU patients and to find out possible factors which may impact on UE.
Methods: We studied the documents of patients who were admitted in a university based PICU with 10 beds in a 1 year period from Jan 2009 to Jan 2010. Factors reviewed included: age, gender, use of cuffed or un-cuffed endotracheal tube (ETT), use of restraints and or sedation, route and duration of intubation, time of day, patient mental state, care of ETT in the last 12 hours, any movement or change of position and mode of ventilatory assist at the time of UE.
Results: 59 UE occurred in 3023 patient-days, 238 intubations and 1631 intubated patient-days. This represents UE rate of 1.95% per patient-day and 3.6% per intubated patient-day. Average age of patients in whom UE had been occurred was 28.5 ± 38.7 (1-156) months. UE were more prevalent in boys than girls (41 vs. 18). UE was more likely with un-cuffed ETT than cuffed ones (50 vs. 9). Restraints were applied in 20 patients (33.9%). Sedative drugs were administered in 41 patients (76%). All of UE were reported in orotrachealy intubated patients (100%). Time distribution was as follows: in 28 patients 8:00 pm- 8:00 am and in 31 8:00 am- 8:00 pm. At the time of UE, 7 patients were unconscious, 9 were lethargic, 28 were agitated and 10 were calm and sedated and at that time 1 had low, 40 had moderate and 15 had lots of secretions. In all cases of UE ETT suctioning was performed in intervals of more than 2 hours in 12 hours leading to UE. In 23 cases, patient movement and in 16 cases, changing his/her position by nursing staff resulted in UE. UE was less likely in patients assisted with T-piece than whom under mechanical ventilation (1 vs. 50).
Conclusions: In our study, patient age less than 2 years, male sex, use of un-cuffed ETT, agitation, irregular or low frequency ETT suctioning, patients movement and mechanical ventilation are more likely associated with UE. Use of sedative by itself is not a protective measure. Nasotracheal intubation may prevent from UE. Low amount of secretions may have protective value.

Paper No: 749.00

Anesthetic management for thimectomy in a patient with Myasthenia Gravis

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Objectives: Case report about anesthetic management for a patient with Myasthenia Gravis

Introduction: Myasthenia Gravis (MG) is an autoinmune disease with IgG antibodies against acethylcholine (Ach) postsynaptic receptors at the neuromuscular junction, attaining a prevalence of 1/20000 individuals. These patients are at risk of developing postoperative respiratory failure due to the muscle weakness and the superimposed surgical stress, posing an important challenge in both intraoperative management and postoperative analgesia.

Case Study A 13 years old female patient, ASA III, bearing a 10 months evolution MG, with a respiratory failure associated with pneumonia and sepsis was admitted to the ICU for mechanical ventilatory support during 4 days. Diagnose was confirmed at discharge with Edrophonium Test and Ach Antibody Receptor test and a treatment with pyridostigmine 180mg/day and prednisone 20mg/day was indicated. Thymectomy was considered due to the rapid progression and treatment resistance. Plasmapheresis cycles were performed 5 days previous to surgery. Forced Residual Capacity yielded normal values. Pyridostigmine was suppressed 6h prior to surgery. Steroid was not interrupted, and the inhibition of the hypothalamic-pituitary-adrenal axis was supplemented intraoperative with hydrocortisone 150mg. No premedication was administered. General anesthesia was induced with 8% sevoflurane, fentanyl 100ug and remifentanyl 0.5ug/kg/min by a continuous infusion pump. After testing palpebral reflex, ventilation with Maplesson C was established and 5 min endotracheal intubation was performed. Anesthesia was maintained with 3% sevofluorane and remifentanyl 0.5ug/kg/min. No muscle relaxants were used. Cardiovascular parameters and oxymetry were monitored. Tramadol 50mg was supplied. Postoperative extubation at 0 score (Leventhal Scale) was without complication. Postoperative analgesia was controlled due to higher sensitivity and risk of respiratory depression caused by opioids. After confirming normal ventilatory capacity (Aldrete 10/10, Chips 0 and Ramsay 2) the patient was transferred to the ICU.

Supplementary Data MG is an autoinmune disorder with decreased number of Ach receptors, thus rising the sensitivity to nondespolarizing muscle relaxants. Excessive curarization and absence of monitoring predispose the onset of ventilatory failure, and a prolonged ICU stay. Recent studies have confirmed the possibility of performing general anesthesia without using muscle relaxants, as in the case presented.

Comments and Discussion: Pharmacological advances in anesthesia permited us a successful management of a MG critical patient without using neuromuscular blocking agents and achieving extubation without complications.

Keywords: Thymectomy; Myasthenia gravis; Anesthetic management

References

1 "Anesthesia for thymectomy in children with myasthenia gravis" Review Article. White, M; Stoddart, P. Pediatric Anesthesia 2004;**14**:625–635.

Paper No: 792.00

Anesthetic management of a giant mesenchymal liver hamartoma in a 2-years old child

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Introduction: Even though Mesenchymal Hamatoma of the liver is the second most common benign liver tumor in children, it is rare. It typically presents in the first 2 years of life. Even though spontaneous remissions are possible and surgical resection is the treatment of choice. When the size of the tumor is big surgery might be very difficult and transplantation might be a useful adjunct. Treatment of these tumors should be concentrated in centers with expertise(1). Anesthetic management need to be planned carefully. Intraoperative problems are frequent and postoperative analgesia is a challenge.

Objectives: 1-Describe the multidisciplinary team work during diagnosis and treatment of a giant liver Hamartoma. 2-Discuss, intraoperative monitoring, fluid replacement, analgesia and possible complications. 3-Present a brief review of the literature.

Patient and methods: A 2-year old boy, 13 kg weigh presented with abdominal distension and respiratory symptoms. Ultrasound, Computed Tomography (CT), and magnetic resonance imaging (MRI) of the abdomen were suggestive of a mesenchymal hamartoma of segments V and VI of the liver. With the mentorship of a trained pediatric liver surgeon and the participation of pediatricians and anesthesiologists the team plan the procedure.

Results: An 8 hour surgery was performed; dissection of the retro hepatic cava vein was difficult but without mayor complications. General anesthesia was induced with Sevofluorane and maintenance was with Fentanyl and Isofluorane. Central venous pressure and arterial blood pressure was monitored invasively. During the dissection of the suprahepatic veins, central venous pressure was reduced to 4-6 mm Hg to reduce bleeding. Even though, the patient required massive transfusion with plasma, red blood cells and platelets. Intravenous morphine was used as analgesia and the patient was extubated at the end of the surgery, discharged from the hospital at the 6th postoperative

day. Clinical follow-up for twenty months were without complications.

Conclusions: Surgical treatment of giant liver tumors is feasible and safe when a trained team or working interdisciplinary with a non experienced teams mentored by experts.

Reference

1 Tannuri AC. Surgical treatment of hepatic tumors in children:lessons learned from liver transplantation. *J Pediatr-Surg*-2009; **44**: 2083–7.

Paper No: 829.00

Separation of Onphalopagus Conjoined twins: Anaesthetic management

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Objective: Report a case about anesthetic management in separation of onphalopagus conjoined twins.

Introduction: Conjoined twins are monozygotic and monochorionic individuals, namely genetically identical and of the same sex, that develop united by different anatomical regions but generally identical regarding the pair. The incidence is 1: 50,000.

Case report A pair of male onphalopagus conjoined twins were delivered by cesarean at 34 weeks of gestational age. They weighed 3.725 kg each one. The right-sided baby was identified as Twin1 and the left one Twin2. Apgar scores were 7/9 and 5/8 for Twin2 respectively. Orotracheal intubation was performed to proceed to reanimation since they presented bradycardia and respiratory distress. Magnetic resonance at 32 weeks showed no anomalies in fetus 1, fetus 2 showed ventriculomegaly, hydrocephalus, cervical lordosis, decreased lung volumes, gastric agenesis with few intestinal loops and right kidney hypoplasia. Decision to surgical separation was taken at 48h life delivery with the participation of two teams of anesthesiologists provided with their anesthesia machines and multiparametric monitors. Both twins were intubated and due to hemodynamic instability dopamine 10-20ug/kg/min was supplied by infusion pump. Anesthesia induction was performed with midazolam 0.1mg, fentanyl 4mcg, vecuronium 0.2mg. The same drugs were used for maintenance. Parenteral hydration with saline 30ml/min was administered by a volumetric pump. Arterial blood pressure (BP) and heart rate (HR) were: 65/40mmHg and 150-160 beats/min, for both twins respectively. Ligature of shared intestinal loops and liver generated serious hemodynamic impairment of Twin2 (HR 84, BP 30/15 and asystolia) leading to death despite CPR maneuvers and transfusion of 35ml Red Blood cells and dobutamine 25ug/kg/min. Twin1 was intubated, and stabilized within the following parameters: BP 74/40mmHg, HR152, remaining in ICU. Extubated after a week of surgery, was discharged five months later.

Supporting data Symmetrical conjoined twins that have a minimal area of juncture are due to surgery, such as onphalopagus twins that share liver and jejunum.

Comments and Discussion: The anesthetic management of conjoined twins is a surgical challenge due to the high complexity procedures. Successful management of conjoined twins relies on close communication and cooperation of all members of the multidisciplinary team.

Keywords: Onphalopagus conjoined twins; anaestethic management

References

1 Anesthetic management for separation of craniopagus twins. W.Q. Huang, J.Y. Fang, L.C. Xiao, X.P. Jiang, J.H. Xia, X. Feng and N. Jiang. Acta Anaesthesiol Scand 2004; **48**: 919-921.

2 Anaesthetic management of total craniopagus twins for magnetic resonance imaging and cerebral angiography. A. Parameswari, M. Vakamudi, V. Raghupathy and R. Siddhartha. British Journal of Anaesthesia 2010; **105** (3): 368–70.

Paper No: 846.00

5% lidocaine patch could reduce needle pain but not rocuronium-induced withdrawal in children

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Introduction: Intravenous catheter insertion before induction of general anesthesia is a challenge especially for children, and some drugs cause pain and discomfort during intravenous injection. Local anesthetics may reduce this kind of complications. We postulated that a pretretreatment with 5% lidocaine patch to the injection site could reduce both venipuncture pain and rocuronium-induced withdrawal.

Objectives: The purpose of this study was to examine the analgesic effect of 5% lidocaine patch compared with placebo patch during venipuncture and rocuronium injection in children.

Methods: Seventy-two pediatric patients (4–15 yr) were allocated into two groups in a randomized, double-blinded way. Group A was pretreated with 5% lidocaine patch and group B was done with placebo patch on venipuncture site. Pain during venipuncture needle insertion was measured by FLACC scores (Faces, Legs, Activity, Cry and Consolability) and withdrawal movement during injection of rocuronium was evaluated by a 4-point scale (1: no response, 2:

movement at the wrist only, 3: movement involving the arm only, and 4: movement in more than one extremity or generalized response). Grade 4 was regarded as generalized movement.
Results: The FLACC score during venipuncture was significantly lower in Group A than in group B ($p < 0.001$). The overall withdrawal movement on injection of rocuronium occurred 92.5% in group A and 84.4% in group B. The incidence of generalized movement was 45% and 53.1% respectively. The withdrawal movements did not show significant differences between groups. Conclusions: Pretreatment with a 5% lidocaine patch to the venipuncture site could be a safe, effective, and simple method to reduce needle insertion pain in children, but this method may not prevent rocuronium injection withdrawal movement during the induction of anesthesia.

Paper No: 851.00

Anesthetic management in interventional cardiac catheterization for congenital heart disease

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Introduction: Recently, pediatric cardiac catheterization is shifting toward therapeutic, trans-catheter interventions. In interventional cardiology, for prolonged procedures and complex interventions, or in critically ill status, general anesthesia is recommended and required.
Objectives: The aim of the study was to review the outcomes of general anesthesia for interventional and diagnostic cardiac catheterization in pediatric patients in our institution.
Methods: We retrospectively examined 315 cases of interventional and diagnostic cardiac catheterization for congenital heart disease performed with general anesthesia between January 2008 and July 2011.
Results: One hundred and eighty-five patients (from 0 to 25 years of age) underwent interventional procedures and 130 patients (from 0 to 25 years of age) underwent diagnostic catheterization. All patients were anesthetized with inhalation of sevoflurane, 2-10 mcg/kg of fentanyl, and muscle relaxants. Mechanical controlled ventilation with endotracheal intubation was performed using room air except the cases required oxygen therapy. Normal blood gases and acid-base status were maintained, particularly when calculating shunt fractions. Means (SD) of anesthesia duration for interventional cardiology and diagnostic catheterization were 245.4 (84.9) and 212.2 (62.0) minutes, respectively. Adverse hemodynamic collapse, which may be caused by myocardial ischemia, occurred in 2 cases during interventional procedures. In one case of two, extracorporeal circulatory assist was needed and the patient was transferred to intensive care unit. The catheter-related complication occurred in 1 case, which was the injury of subclavian artery. The patient was transferred to the operating room for surgical repair. In the patients who had pulmonary artery hypertension (PH) associated with congenital heart disease, there were no incidents of critical PH crisis during anesthetic induction, maintenance, and emergence.
Conclusions: While planning the general anesthesia for cardiac catheterization, we should understand the underlying pathophysiology, the purpose of the procedures, and anesthesia-induced changes in hemodynamic parameters. The cardiac and respiratory effects of the drugs and technique chosen should avoid distortion of hemodynamic measurements. The drug combination of sevoflurane and fentanyl may be the preferred method to achieve the stable hemodynamic condition and to prevent PH crisis during interventional cardiac catheterization. However, recent concerns about the effects of general anesthetics on the developing brain should be considered in infants. In case of rapid deterioration of the cardiovascular status, drugs for resuscitation have to be readily available and should be prepared in appropriate dose for each patient before anesthesia.

References

1 Hollinger, *et al.* Cardiac catheterization laboratory: Catheterization, interventional cardiology, and ablation techniques for children. *International Anesthesiology Clinics* 2009; **47**:63–99.

Paper No: 868.00

A Perioperative Audit of the Paediatric Cochlear Implant Program at the Singapore General Hopsital

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Introduction: Cochlear implantation in children is an established procedure for treating irreversible hearing loss. The procedure itself is time-consuming, expensive and challenging. Objectives: The aim of the study was to surface anaesthetic issues involved in the perioperative management of such patients in a predominantly adult tertiary general hospital.
Methods: We conducted a retrospective clinical audit of 184 paediatric (age < 12) cochlear implantation cases. All those cases were operated by the same surgeon in Singapore General Hospital during the period from 1997 to 2010. Both unilateral and bilateral implantation procedures for children were included in this study.
Results: 184 procedures were performed on 173 patients under general anaesthesia. The average age (mean [sd, range]) at the time of surgery was 3.7 [2.6, 0.7-11] years. Inhalational anaesthesia was the more popular choice for

induction (66.3%) as compared to intravenous agents (33.7%) with the most popular inhalational and intravenous agents being sevoflurane and propofol respectively. Patients were intubated and ventilated using inhalationals. Analgesia consised of local anaesthetic infiltration supplemented by narcotics. The mean duration of the unilateral and bilateral implantation procedures were 3.2 [1.0, 1.2-6.5] hrs and 4.7 [0.8, 4-6] hrs respectively. There were 2 induction complications (1 episode of laryngospasm and 1 case of difficult IV access) and there were 2 cases of intra-operative tachycardia. The most common post-operative complication was pain which was reported in 97.8% (180) of the procedures, followed by nausea and vomiting which was reported in 10.3% (19) of the procedures. Fifteen patients (8.1%) required additional analgesia in the post-anaesthetic care unit. In the ward, 14 patients (7.6%) required stronger analgesia in addition to paracetamol. Peak paracetamol requirement (22.9 [16.6] mg/kg) was on the first post-operative day. Nausea and vomiting was reported in 10.3% (19) of the procedures. The correlation between increasing age and post-operative nausea and vomiting was statistically significant ($p < 0.05$) as was the association between age and analgesic requirements. The average duration of hospital stay was 3.2 [1.0, 1-6] days. Mean age at time of surgery as well as duration of unilateral implantation procedures decreased over time. A trend towards same day admissions (SDA) was also noted.

Conclusion: Cochlear implantation in paediatric patients is a relatively safe procedure involving few complications.

Keywords: Paediatric Cochlear Implantation; Anaesthesic Outcomes; Clinical Audit

Paper No: 881.00

A single dose of propofol improves intubating conditions during inhalational induction with sevoflurane in children

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Introduction: Tracheal intubation without a muscle relaxant is a well established clinical concept in pediatric anesthesia.[1] However, the quality of tracheal intubation may contribute to laryngeal morbidity.[2] Objectives: This randomized, double-blind, placebo-controlled study was designed to investigate whether a small bolus dose of propofol before intubation may improve the conditions for tracheal intubation in children anesthetized with sevoflurane.

Methods: With IRB approval and parental informed written consent, 77 children aged 1-5 yr, ASA status I and II, scheduled for elective ophthalmic surgery, were allocated randomly to receive either propofol 1% 1 mg/kg [$n = 39$] or an equivalent volume of saline 0.9% [$n = 38$] during induction of anesthesia with sevoflurane. After priming of the anesthetic circuit with sevoflurane 8% in 2:1 N2O:O2 at a fresh gas flow of 8 L/min, inhalational induction was initiated via a facemask. Once the loss of the eyelash reflex occurred, concentrations were decreased to achieve and maintain an end-tidal sevoflurane concentration of 4%. When the pupils were deemed to be miotic and centred the study drug was given, and laryngoscopy and tracheal intubation were performed. The primary endpoint of the study was the proportion of patients having excellent conditions for intubation. Ease of laryngoscopy, vocal cord position, coughing, jaw relaxation and limb movement were allocated a score of 1-4, with 1 being excellent conditions.[3] Intubating conditions were considered clinically unacceptable if any category scored > 2. Statistical analyses were performed using the Student's t test, the Fisher's exact test and Mann-Whitney U test, $p < 0.05$ being regarded as significant.

Results: The two groups were comparable with respect to demographic characteristics. The number of children having excellent intubating conditions was higher in the propofol group [33/39 (84.6%)] than in the placebo group [17/38 (44.7%)] ($p < 0.01$). There were no cases of clinically unacceptable intubating conditions in the propofol group compared to 10/38 (26.3%) in the placebo group ($p < 0.01$).

Conclusions: A bolus dose of propofol 1 mg/kg significantly improves intubating conditions in children anesthetized with sevoflurane/nitrous oxide.

References

1 Morton NS. Tracheal intubation without neuromuscular blocking drugs in children. *Pediatr Anesth* 2009; **19**:199–201.

2 Mencke T, Echternach M, Kleinschmidt S, *et al.* Laryngeal morbidity and quality of tracheal intubation. *Anesthesiology* 2003; **98**: 1049–56.

3 Viby-Mogensen J, Engbaek J, Eriksson LI, *et al.* Good clinical research practice (GCRP) in pharmacodynamic studies of neuromuscular blocking agents. *Acta Anaesthesiol Scand* 1996; **40**:59–74.

Paper No: 919.00

I-GEL (Supraglottic Airway Device) in pediatric ophthalmic anesthesiology

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Use of supraglottic airway devices is the most safe method to provide patency of respiratory tract meeting the requirements of modern outpatient anesthesiology. In our clinic we use I-GEL in adults since 2007, but pediatric I-GEL devices have become commercially available only since 2010. Aim of our paper is to perform an analysis of I-GEL in pediatric outpatient anesthesiology. We have performed a prospective study of 32 anesthesia cases in children using I-GEL. Age of the children was from 4 to 14 years (mean, 7.2 ± 3.0 years). Surgery

included scleroplastic operations in 30 children, levatoroplasty in 1 patient and corneal grafting in 1 patient. In 15 children I-GEL airway devices size 2.0 and in 17 children – size 2.5 were used. In 25 children induction was performed with Sevorane and anesthesia was supported with Sevorane. In 7 children older than 7 years induction was performed with Propofol and anesthesia was supported with Sevorane. Artificial pulmonary ventilation was performed with BLEASE respirator in SIMV mode. Ventilation parameters were controlled with Capnomac Ultima Datex monitor. All the measurements were performed at MAC of 1.2-1.4. In all the children inspiratory and expiratory volumes were measured; escape volume was also calculated. After measuring in 10 consecutive respiratory cycles mean values of these volumes were calculated in all the children. Besides, in all the children escape percent was calculated as follows: escape percent = escape volume $\times$ 100% / inspiratory volume. For control the same indicators have been calculated with 1 liter bag attached to the respiratory contour and inspiratory volume preestablished at 200 ml. I-GEL were introduced in all the children without technical problems – at first attempt in 31 case and in 1 case size 2.5 airway device was exchanged for size 2.0 due to auscultatory defined escape. In all the children adequate ventilation and oxygenation were performed during anesthesia. (pCO2 – 32 to 41 mm H2O, SpO2 – 99%). Auscultatory air escape was defined in 3 cases. According to gas monitor air escape value was from 2 to 70 ml (mean, 18.9 $\pm$ 3.4) which made 2 to 20% of respiratory volume (mean escape percent 8.3 $\pm$ 3.8). In control measurements with 1 liter bag attached to the respiratory contour and preestablished respiratory volume of 200 ml air escape made from 1 to 40 ml (mean, 17.5 $\pm$ 4.8 ml) or 2 to 20% of respiratory volume (mean escape percent 7.7 $\pm$ 2.6). So, there was no statistically significant difference between data achieved during anesthesia and control measurements. In other words, use of I-GEL for artificial pulmonary ventilation in children provides insignificant loss of breathing mixture which does not significantly differ from loss during ventilation of a bag attached to the respiratory contour speaking in favor of sufficient airtightness of these airway devices. In all the children airway devices were removed at the background of adequate spontaneous breathing. No blood remnants were found on airway devices after removal. No complications during anesthesia were marked.

Conclusion: I-GEL supraglottic airway device sizes 2.0 è 2.5 are effective and safe air ducts and may be recommended, alongside with laryngeal masks, for providing respiratory tract patency and artificial pulmonary ventilation during planned outpatient operations in children.

Paper No: 934.00

Fibreoptic intubation using the retromolar space in a paediatric patient with severe trismus and bilateral nasal stenoses

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Introduction: In patients with restricted mouth opening, intubation can usually be achieved by the nasal route. Unfortunately, in some patients, nasal intubation is contraindicated because of concomitant nasal pathology or coagulopathy.

Objectives: We present a case of a paediatric patient with severe trismus and bilateral nasal stenoses who required anaesthesia for segmental mandibulectomy. To obviate the need for tracheostomy and its potential complications, 2,3 airway control was achieved using the retromolar space as an access for flexible fibreoptic orotracheal intubation.

Methods: A 21 kg, 125 cm 8-year-old boy with right mandibular rhabdomyosarcoma presented for mandibulectomy. He had previously undergone radiotherapy with tumor resection and plastics reconstruction with a scapular osteocutaneous flap. Due to overgrowth of the bone flap, he had severe mandibular asymmetry with chin deviation towards the left, worsening malocclusion and severe trismus with an interincisor distance of less than 5 mm. General anaesthesia was induced with propofol 40 mg and fentanyl 30 mcg IV. The patient was ventilated by bag and mask without difficulty. Rocuronium 10 mg IV was given. Resistance was encountered during attempts to pass a paediatric bronchoscope through both right and left nares. The fibreoptic scope was then inserted into the left retromolar space. The epiglottis and glottis were identified. A 5.0 mm ID tracheal tube was guided over the bronchoscope for successful intubation. Surgery proceeded uneventfully. The patient was extubated and transferred to the post anaesthesia care unit in good condition.

Results: An awake fibreoptic intubation was not chosen due to the patient's young age, inability to cooperate, and anticipated difficulty in airway topicalization.4 Severe trismus precluded the insertion of a rigid laryngoscope intraorally. Because of the risk of epistaxis in a patient with restricted mouth opening, nasal fibreoptic intubation attempts were quickly abandoned once difficulty in inserting the scope was encountered. Fibreoptic oral intubation through the retromolar space was performed. Located between the last molar and the ascending ramus of the mandible, the retromolar space has been used to anchor tracheal tubes after maxillofacial surgery in children.5 Based on measurements of a 3-dimensional reconstruction model created from a computed tomography scan of the patient's face obtained preoperatively, the left retromolar space was deemed large enough to accommodate a 5.0 mm ID tracheal tube.

Conclusions: Flexible fibreoptic retromolar intubation in a paediatric patient has never been reported. This technique offered an invaluable solution to manage a formidable paediatric airway challenge.

References

1 Holzapfel L. Nasal vs oral intubation. *Minerva Anestesiol* 2003; **69**: 348–52.

2 Durbin CG Jr. Early complications of tracheostomy. *Respir Care* 2005; **50**:511–5.
3 Epstein SK. Late complications of tracheostomy. *Respir Care* 2005; **50**:542–9.
4 Xue FS, Luo MP, Xu YC, and Liao X. Airway anesthesia for awake fiberoptic intubation in management of pediatric difficult airways. *Paediatr Anaesth* 2008; **18**: 1264–5.
5 Arora S, Rattan V, Bhardwaj N. An evaluation of the retromolar space for oral tracheal tube placement for maxillofacial surgery in children. *Anesth Analg* 2006; **103**: 1122–5.

Paper No: 987.00

Safety and efficacy of spinal anaesthisia for pyloromyotomy in neonates with pyloric stenosis

Raul Eduardo Fernandez, Eduardo Halac, OlviaPatricia Villarreal and Victor Nievas

Introduction: Pyloric stenosis usually affects male neonates between 17-25 days of life. Girls are sometimes affected. Supraumbilical pyloromyotomy under general anaesthesia is the usual procedure for relieving pyloric obstruction. We propose the Ramstedt right extramucosal supraumbilical pyloromotomy under spinal anaesthesia. Somri has published a series involving 25 cases. In 23 cases, excellent results were achieved.
Objectives: To compare the safety margins and analgesic efficacy of spinal anaesthesia in neonate pyloromyotomy. Methods Neonates diagnosed as having pyloric stenosis were given spinal anaesthesia. They all had a clinical pyloric obstruction diagnosis proven by ultrasound without any associated malformations. Spinal anaesthesia with appropriate pencil-shaped needles (25G x 25 mm) was carried out (with neonates in the sitting position) using isobaric bupivacaina 0.5%, 0.8mg/kg. Vital signs were monitored at baseline and from then on, every 5 minutes to complete a period of 30 minutes Results Thirty neonates with a mean age of 23 days (18-25) were studied. Baseline vital signs were similar in all patients. Sensory levels achieved ranged between T3-T5 thoracic segments within 5-7 minutes after the spinal puncture. The analgesic effect lasted 50-60 minutes, allowing enough time for the surgical procedure. Surgeons agreed that this procedure provided the proper surgical time and they found no complications during the surgical interval.
Conclusions: Ramstedt right extramucosal supraumbilical pyloromyotomy under spinal anaesthesia avoids the need for intubation and short-time mechanical ventilation; these procedures, occasionally, are fraught with either minor or major complications. Spinal anaesthesia for simple surgical procedures such as pyloromyotomy for pyloric stenosis offers effective anesthetic levels for surgeons without needing airway manipulation. The procedure was well tolerated and accepted by both the surgical and paediatric team. Spinal anaesthesia for pyloromyotomy arises as a valid option.

References

1 Somri M, Gaitini LA, Vaida SJ, Malatzkey S, Sabo E, Yudashkin M, Tome R. The effectiveness and safety of spinal anesthesia in the pyloromyotomy procedure. *Paediatr Anaesth* 2003; **13**(1): 32–7.
2 Kachko L, Simhi E, Freud E, Dlugy E, Katz J. Impact of spinal anesthesia for open pyloromyotomy on operating room time. *J Pediatr Surg*. 2009; **44**(10):1942–6.
3 Kachko L, Sanko E, Freud E, Katz J. Spinal anesthesia in a child with Brachmann-de Lange (Cornelia de Lange) syndrome. *J Anesth*. 2010; **24**(6):942–4.
4 Williams RK, Adams DC, Black IH. While we wait. *Anesth Analg* 2011; **112**:1239–1241.
5 Williams RK, Adams DC, Aladjem EC. The Safety and efficacy of Spinal Anesthesia for surgery in infants: The Vermont Infant Spinal Registry. *Anesth Analg* 2006; **102**:67–71.

Paper No: 1002.0

Ultrasound-guided axillary vein access in neonates: an alternative approach for central venous catheterization

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Introduction: Previously, has been reported the use of ultrasound (US) in catheterization of the internal jugular vein (IJV), the subclavian vein (SCV) and the brachiocephalic vein in children1-3. However, these studies are mainly developed in children older than neonates. Cannulation of central vessels in neonates is more difficult than the same procedure in older children and adults. On the other hand, neonates offer a unique advantage in terms of visualization with US techniques.
Objective: We undertook this current study to describe the technique and to evaluate the results of the US-guided approach to the axillary vein (AV) in neonates.
Methods: We scheduled 67 neonates in a period of 7 months. The scan was performed using a Sonosite M-Turbo (Bothell, WA, USA) with its linear probe (13 – 6 Mhz - HFL38x). Patients were located in a slight Trendelemburg position with a rolled towel under their shoulders. The arm of the same side was abducted in 70°-90° approximately, for improving the visualization of the AV. The scan was performed first in the neck and then the probe was moved downward following the IJV toward its junction with the SCV. At this point, we obtained the picture of the SCV interrupted by the acoustic shadow of the clavicle (Pirotte). Next, the probe was moved laterally over the surface of the pectoral muscle in the infraclavicular area following the AV. The puncture was done in plane near to the lateral border of the pectoral major

muscle reaching the AV as distal as possible always under real-time US visualization. Side of puncture, number of attempts, redirection the guidewire. Were registered. All patients were followed for 7 days after the procedure to observe any relevant condition.

Results: In all patients the procedure was successful. In 66% the AV was punctured at the first attempt (25.5% two attempts, 8.5% three attempts). In 63.8% movements to redirect the guidewire were needed. No arterial puncture, and no pneumothorax were registered. A moderate shoulder swelling was presented in 14% three days after the procedure. In those cases the CVC was withdrawn and patients were followed clinically and with US. No thrombus or other complication was detected by US in any patient. No patients evidenced signs of infection or sepsis related with CVC.

Conclusion: The US-guided approach to the AV in neonates constitutes a feasible technique and may represent an attractive alternative. This real-time technique is safe and useful, providing some advantages over more traditional approaches, such as the possibility to do the puncture in plane.

References

1 Hosokawa Koji, et al. A Randomized Trial of Ultrasound Image–based Skin Surface Marking versus Real-time Ultrasound-guided Internal Jugular Vein Catheterization in Infants. *Anesthesiology* 2007; **107**:720 – 4.

2 Pirotte T, Veyckemans F. Ultrasound-guided subclavian vein cannulation in infants and children: a novel approach. *Br J Anaesth* 2007; **98**:509-14.

3 C. Breschan, et al. Size of internal jugular vs subclavian vein in small infants: an observational, anatomical evaluation with ultrasound. British Journal of Anaesthesia Page 1 of 6 doi:10.1093/bja/aeq123.

Paper No: 1041.0

Whole lung lavage for treatment of pulmonary alveolar proteinosis in pediatric age group- report of 9 cases

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Introduction: Pulmonary alveolar proteinosis (PAP) is a very rare disease in children, characterized by the accumulation of large amounts of surfactant proteins in the alveoli,which severely reduces gas exchange and may progress to fatal respiratory insufficiency.

Objectives: Whole-lung lavage (WLL) is the preferred technique for the treatment of severe PAP. However, selective lavaging of each lung is technically difficult and most often impracticable in small children.

Materials and Methods: This report describes the results in nine pediatric cases of advanced PAPtreated by WLL under general anesthesia during a 9 year periodfrom 2000 to 2009in MasihDaneshvari university teaching Hospital, Tehran, Iran. PAP had been diagnosed in all patients by open-lung biopsy. Results; The first older child was successfully treated with a series of unilateral pulmonary lavages without CPB using a method similar to adult patients. The other eight cases were treated by simultaneous lavage of both lungs using partial cardiopulmonary bypass (PCPB).Ofthem,2 cases suffered fromepisodes of severe hypoxemia during lavage and another patient died from uncontrolled pulmonary bleeding in the immediate postoperative period. Overall, 7 patients tolerated the procedures relatively well and were successfully separated from bypass, their trachea was extubated within the day after procedure and had good post lavage conditions. Furthermore, one of them safely underwent two more bilateral sequential WLL without employing PCPB in the same session when she grew older. Anotherpatient died from pulmonary infection 13 months after the procedure.

Conclusion: Our experience suggests that partial CPB permits acceptable oxygenation support during WLL in small children suffering from severe PAP when lung separation and selective lavaging of each lung isimpracticable. However, a regular outpatient follow up for on time diagnosis of recurrence of the disease and early treatment of pulmonary infections play an essential role in the patient's long term outcomes after WLL.

Reference

1 Radpay B, whole lung lavage for treating a pediatric case of Pap, *Mazandaran Med. J* 1997;, **3**;233–237.

Paper No: 1060.0

Is infusion of glucose necessary in the operatory?

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Introduction: Exists much discussion about liquids in the operatory time and especially glucose to avoid hypoglycemia, secondary to the fast and pathology, This study was realized to determine if we really need of glucose in the operatory.

Methods: We realizes a prospective study in patients from 0 to 13 years, ASA I at III, All patients were measured glycemia, before, during and after the surgical procedure and they were with SFA or DSA 5%, FIG 4 to 6 mcg/kg/min, to determine if they present hypoglycemia (less to 45 mg/dL (2,5 mmol/L) or hyperglycemia (more to 180 mg/dL (10 mmol/L).

Results: We realized samples in 61 patients, time of fast average was 10:44 hours, age average 4.9 years, time of

procedure average 50 min.; glycemia before the procedure was of 105 mg/dL (64-205 mg/dL), during 119 mg/dL (57-210 mg/dL) and after 135mg/dL (54-304 mg/dL), when these results were divided in two groups those that had received DSA 5% and SFA solution, we found in the group of SFA (45 patients) only one patient made hyperglycemia and nobody hypoglycemia. In the group of DSA 5% (16 patients) we found hyperglycemia in 58.3% of the patients.
Conclusions: With this study we demonstrate that it is not necessary the use of glucose in the operatory of the pediatric patient, although in this study we don't find hypoglycemia in both groups the only patient that made hyperglycemia in the group of physiologic solution it was a boy with skull traumatism with fracture and in the group of glucose it presents bigger incidence of hyperglycemia, a complication that should be analyzed.

Paper No: 1086.0

Comparison of topical lignocaine gel 2% and proparacaine drops 0.5% for perioperative analgesia and prevention of oculocardiac reflex in elective pediatric strabismus surgery

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Introduction: Pediatric strabismus surgery is moderately painful and associated with oculocardiac reflex (OCR). Topical local anaesthetic drops are routinely used to decrease the incidence of OCR. Intraoperative opioid administration may lead to increase in post operative nausea and vomiting (PONV).
Objectives: Primary- To evaluate effectiveness of single application of the lignocaine gel 2% vs multiple drops of proparacaine 0.5% as perioperative analgesic in strabismus surgery. Secondary: To evaluate its efficacy in the prevention of OCR and PONV.
Methods: One hundred & thirty children (1-14 years) scheduled for elective strabismus surgery were included. After induction of anesthesia, children were randomized to Group G [application of 2% lignocaine gel in the operative eye] and Group P [0.5% proparacaine eye drops instillation in the operative eye]. Intraoperative analgesia was supplemented with 0.5mcgkg-1 fentanyl. Intraoperative OCR was managed by instilling one drop of proparacaine (Group P) or one drop of saline (Group G) and if needed with atropine 5-10 mcgkg-1. In the postoperative period, rescue analgesia was provided with fentanyl and ibuprofen. Postoperative nausea & vomiting (PONV) was treated with metoclopramide.
Results: Demographic data and number of muscles operated was comparable in both the groups. Intraoperative rescue fentanyl requirement was significantly less in group G (1/58) as compared to group P (12/65) ($p = 0.002$). Postoperative ibuprofen requirement was also significantly less in group G (16/58) as compared to group P (38/65) ($p = 0.001$). Incidence of OCR was less in group G 33/58 (56.9%) as compared to group P 41/65 (63.1%) ($p = 0.09$). Severity of OCR (requiring atropine) was also comparable. Incidence of PONV in first 24 hours was significantly less in group G (6/58) as compared to group P (16/65) ($p = 0.04$)
Conclusions: Single application of lignocaine gel provides better Intraoperative and postoperative analgesia and reduces PONV in comparison to proparacaine drops. Single application of lignocaine gel is as effective as multiple drops of proparacaine drops for prevention of OCR intraoperatively and gel also obviates longer interruption of surgery for supplementation of topical anesthetic drops.

References

1 Howard G. Mendel, Kathleen M. Guarnieri, Linda M. Sundt, Marc C. Torjman. The Effects of Ketorolac and Fentanyl on Postoperative Vomiting and Analgesic Requirements in Children Undergoing Strabismus Surgery. *AnesthAnalg* 1995; **80**:1129-33.
2 N. Gupta, R. Kumar, S. Kumar, R. Sehgal, K. R. Sharma. A prospective randomised double blind study to evaluate the effect of peribulbar block or topical application of local anaesthesia combined with general anaesthesia on intra-operative and postoperative complications during paediatric strabismus surgery. *Anaesthesia* 2007; **62**:1110–1113.
3 Weir PM, Mumo HM, Reynolds PI, Lewis IH, Wilton NC. Propofol infusion and incidence of emesis in paediatric outpatient strabismus surgery. *Anesthesia and Analgesia* 1993; **76**: 760.
4 Celia E. Allison, Jacob J. De Lange, Frank D. Koole, Wouter W. A. Zuurmond, Herman H. Ros, Nico T. van Schagen. A Comparison of the Incidence of the Oculocardiac and Oculo respiratory Reflexes During Sevoflurane or Halothane Anesthesia for Strabismus Surgery in Children. *Anesth Analg* 2000; **90**:306.
5 N. Karanovic, M. Jukic, M. Carev, G. Kardum, Z. Dogas. Rocuronium attenuates oculocardiac reflex during squint surgery in children anesthetized with halothane and nitrous oxide. *Acta Anaesthesiol Scand* 2004; **48**:1301–1305.

Paper No: 1100.0

Dog Bites in Pediatric Patients

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Introduction: Dog bites are a frequent problem in the health care practice in our community. There are cases of severe injuries, even followed by death. Severe cases affect the areas of head and neck, and the anesthesiological considerations are very important.

Goals: Know the epidemiological characteristics and perioperative complications of the patients with dog bites in our care center.
Materials and Methods: Type of study: Retrospective, descriptive. Out of a total of 127 children with dog bites, 38 cases which entered the emergency operating room from May 2008 to May 2011 were analyzed. Variables such as age, gender, weight, place of the bite, ASA classification, difficulty in the airway operation, surgical time, complications, requirements of mechanical ventilation and postoperative intensive care and hospitalization time. The statistical analysis was performed with the measures of central tendency.
Results: The results were the following. Average age 5 years old, gender male 70% of the cases, weight 23 kg, place of bite: Head and neck in 70%, ASA III 29% and ASA IV 8%. Surgical time 90 minutes average. The delay in a patient waking up was associated to benzodiazepines and morphinan derivatives and the sinus tachycardia of 2 patients suffering from hypovolemia. A case of severe hypovolemia derived in two episodes of intraoperative cardiac arrest. Although there are no incidents registered in the air way handling, 3 patients required mechanical ventilation and postoperative intensive care due to the potential compromise of the airways (due to neck injuries) and hemodynamic compromise, and one of them was hospitalized 120 days, and death after 5 months in another center.
Discussion: Dog bites represent an important social and assistance problem. Current situation calls for a review and an analysis. Patient treatment is interdisciplinary. The role of the anesthesiologist is essential regarding the airways handling, ventilation and hypovolemia, and extends to postoperative care with pain management.
Conclusions: In children, in particular the youngest, head and neck are frequently injured, and the role of the anesthesiologist is essential. We think it is extremely important that all the people involved commit and be aware about the prevention of this type of trauma, such as animal owners, parents, governmental authorities and sanitary personnel.

Keywords: Dog bite; pediatrics; trauma; complications

References

1 Mendez Gallart R, Gómez Tellado M, Somoza Argibay I y cols. Dog bites. *An. Esp. Pediatr*. 2002; **56**: 425–429.
2 Schvartzman Sergio D, Pacin Mirta B. Injury for dog bite in children. *Arch. arg. pediatr* 2005.v. 103 n. 5. Buenos Aires Sep. /Oct. 2005.
3 Menéndez Cuevo A. y cols. Airways handling in the polytraumatized children. *Bol. Pediatr*. 2008; **48**: 80–88.

Paper No: 1101.0

Effects of Ondansetron on Sevoflurane Induced Paediatric Emergence Agition

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Introduction: Prevalence of sevoflurane induced emergence agitation in paediatric patients is high(1,2).Ondansetron has been shown to reduce delirium after cardiac surgery in adults(3).
Objectives: To evaluate the effects of ondansetron on sevofurane induced emergence agitation in paediatric patients undergoing infraumblical surgery with caudal block.
Methods: Forty 2-7 year-old children were assigned to two groups. Study group consisted of 20 children receiving peroperative ondansetron (0,1 mg/kg iv), control group consisted of 20 children receiving placebo. All children were premedicated with 0,5 mg/kg oral midazolam. Emergence agitation score (PAED), induction quality, parental separation, sedation and pain scores were evaluated at postoperative 10, 20, 30, 60, 120, 180 mins. Results: Demographic data and anaesthesia, operation times were similar among the groups. Agitation ($p > 0,05$), pain scores($p > 0,05$) were identical among the groups during the study period. Induction quality, parental separation, sedation scores were also similar among the groups.
Conclusion: Perioperative prophylactic use of ondansetron did not reduce the sevoflurane-induced emergence agitation in paediatric patients.

References

1 Galinkin JL, *et al. Anesthesiology* 2000; **93**:1378–83.
2 Cravero J, *et al. Paediatr Anaesth* 2000; **10**:419–24.
3 Bayindir O, *et al. J Cardiothorac Vasc Anesth* 2000; **14**:288–92.

Paper No: 1122.0

Case report: a ten year old boy with pheochromocytoma

Ana Nobre, Filipa Aguiar and Teresa Rocha

Introduction: Pheochromocytoma tumors are rare in children. Although well described for the adult population, they are poorly characterized for the pediatric population. We present a case report of a child with a pheochromocytoma, reviewing the most frequent tumor's manifestations, diagnostic methods, preoperative and intraoperative management and follow-up techniques.
Case report A ten year old boy was diagnosed with bilateral papillary edema in an ophthalmologic routine examination. He was referred to his assistant pediatric doctor for evaluation, who diagnosed him with hypertension. He had symptoms of headache, sweating and palpitations for three years. He was submitted to a variety of laboratory and imaging tests, which led to the diagnosis of a pheochromocytoma in the left adrenal gland. An excision of the tumor was planed. The child underwent preoperative blockade with phenoxybenzamine 10 mg bid and propanolol 10 mg tid for 2 weeks, normalizing the tensional values. The child was submitted to left adrenalectomy under combined anesthesia. A general anesthesia was administered with

Midazolam 3 mg, Alfentanil 0.6 mg, Propofol 50 mg and Cisatracurium 10 mg. The trachea was intubated with a 6.5 cuffed endotracheal tube and anesthesia was maintained with sevoflurane and a misture of 30/70 N2O/O2. A lombar epidural catheter was placed, with administration of Ropivacaine 50 mg and Sufentanil 4 μg. An arterial line and a central venous line were placed for monitoring blood pressure and fluid status intraoperatively. Serial arterial blood samples were taken and due to a hemoglobin value of 8.4 g/dL, one unit of packed red blood cells was administered. During surgery there were blood pressure swings, with maximal values of 220/100 mmHg. We used esmolol boluses (total 50 mg) and a perfusion of sodium nitroprusside (total 10 mg) to control hypertension. Excision of the tumor resulted in no hypotension. The surgery had duration of 4 hours. The child was transferred to the ICU, where he stayed for 3 days, with no relevant intercurrences. He was discharged home after 7 days, clinically well, with controlled tension values and with indications to go to a Pediatric Oncology consultation and do long term follow-up catecholamine measurements.

Conclusion: Pheochromocytoma is a rare but important tumor in children. Appropriate evaluation and management are essential for a favorable outcome.

References

1 Ross, J. – Pehochromocytoma special considerations in children – Urologic Clinics of North America, vol 27, issue 3; 2000.

2 Reddy, V. et al – Twenty-five-years surgical experience with pheochromocytoma in children – The American Surgeon, vol 66, n°12; 2000.

3 Beltsevich, D. et al – Pheochromocytoma surgery: epidemiologic peculiarities in children – World Journal of Surgery, vol 28; 2004.

4 Pham, T. et al – Pheochromocytoma and Paraganglioma in children: a review of medical and surgical management at a tertiary care center – Pediatrics; vol 118, n°3; 2006.

5 Ludwig, A. et al - Recent advances in the diagnosis and treatment of pheochromocytoma in children - The American Journal of Surgery, vol 194, 2007.

6 Kohane, D. et al - Case 16-2005: A Nine-Year-Old Girl with Headaches and Hypertension – The New England Journal of Medicine, vol 352;21; 2005.

7 Wagespack, S. et al - A Current Review of the Etiology, Diagnosis, and Treatment of Pediatric Pheochromocytoma and Paraganglioma - The Journal of Clinical Endocrinology & Metabolism, vol. 95 no. 5 2010.

8 Hack, H. et al – The perioperative management of children with phaeochromocytoma – Paediatric Anaesthesia, vol 10; 2000.

Paper No: 1123.0

A meta-analysis of 175 cases at Emergency Paediatric and Surgical Centre in Goderich, Sierra Leone

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Introduction: Sierra Leone is among the world's poorest countries (ranked 217/227 - GDP p/c 900$). Caustic soda is used for the home making of soap (source of income) and is often ingested by children. A programme dedicated to the management of oesophageal corrosive injuries was established in 2005 in Goderich-Freetown by the Italian NGO EMERGENCY.

Objective: This experience offers the opportunity to identify the therapeutic approach of corrosive ingestions in developing countries. The goal of Anaesthesia Services is to face the multiple challenges of this paediatric population and the unusual surgery procedure with low anaesthesia technologies, poor pharmacological availability, low family compliance. -Which kind of anaesthesia? -Severe malnutrition: a morbidity factor? -Airway management with upper airways involvement and anatomical deformity? -Repeated dilatations requiring multiple anaesthesia in short span of time, is it dangerous?

Methods: Our Hospital was supplied in 2005 with fiberoptic endoscopes and dilatation devices (balloon dilators and bougies) for the treatment of children presenting corrosive ingestions. For Anesthesia we chose OT intubation and manual ventilation with Alothane, induction with Ketamine, muscle relaxation with Vecuronium.

Results: In 5 years 175 children (mean age 5 years, range 13 months/15 years) were admitted: -Patients receiving dilatations: 77.7% -Perforations and death rate: 4.5% -One cardiac arrest during the dilatation procedure -In 6 patients (3.4%) intubation was not possible due to severe caustic damage of the upper airways Five deaths occurred: one during pneumatic dilatation, one after 8 months, 3 patients became severely malnourished and died during dilatation program.

Discussion: We observed two perforations and deaths during balloon dilatation. We supposed due to the contemporary transmural high pressure of the balloons (endotracheal tube and dilatator). We believe that bougie dilatation should be preferred in these settings. Babies are hypersecretive: we premedicate them with atropine, antibiotics and antisecretory compounds. Children nutritional status is a major concern: feeding by NGtube is valuable in the short term, for long periods a gastrostomy is more effective to improve nutritional status before and after dilatation.

Conclusion: Anatomical deformities of the upper airways are to be expected and evaluated prior to anaesthesia. Sever malnutrition is a per-operative morbidity factor: nutrition by gastrostomy should anticipate dilatations. Ketamine is the first choice anaesthetic and, with Vecuronium, should be managed with care to the low protein pool of these malnourished babies. Alothane is safe and with a wide therapeutic index. Short span of time for repetitive surgical procedures has not increased per-operative morbidity.

References

1 S. Contini MD, C. Scarpignato MD, DSc, FACG, A. Rossi MD, PhD, G. Strada MD.: Features and management of children's oesophageal corrosive lesions in sierra leone. lessons from a 175 consecutive patients. 2010.

2 Contini S, Garatti M, Swarray-Deen A, *et al.* Corrosive oesophageal stricture in children: outcomes after timely or delayed dilatation. *Dig Liver Dis* 2009; **41**: 263–68.

3 CIA. The World Factbook. 2010.

Paper No: 1138.0

Pediatric I-Gel use in 100 children

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Introduction and Objectives of Study: The I-GEL LMA is a supraglottic device with a non-inflatable cuff that adapts to the hypopharyngeal anatomy and has been recently introduced in pediatric practice. The aim of this study is to describe insertion characteristics and airway seal in pediatric population.

Material and Methods: A total of 100 children under 30kg were prospectively enrolled. We excluded prematures or neonates below 3 kg, or with lung disease, difficult airway or risk factors for regurgitation. Standard monitoring and preoxygenation was performed. Iv (propofol 3-5 mg/kg, fentanil 2mcg/kg and atropine if needed) or inhalatorial induction and iv canalization was performed. We did not use neuromuscular blocking agents before inserting the I-Gel. Trapezius squeezing test was carry out to guarantee adequate depth of anesthesia. I-gel was inserted according to manufacturer's recommendations with a lubricated gastric tube previously inserted down the drainage tube. Correct insertion was assessed by proper chest expansion, the presence of CO2 wave on the capnograph and absence of audible leak and gastric insufflations. Children were ventilated with VCV: VT: 8ml/kg and respiratory rate to obtain ETCO2 between 30-40 mmHg. We collected: insertion time, easy of gastric tube placement, leak pressure peak and plateau pressures and ETCO2 with this ventilatory parameters and airway-related complications.

Results and Discussion: There were 51,4% males with a median age and weight of 2,7 +/- 1 years old and 13,5+/-6,1 kg. I-Gel size 2 was the most commonly used (65,7%), the I-Gel size 1 in 17,1%, the I-Gel size 1,5 in 14,3%, and the I-Gel size 2,5 in 2,9%. Insertion was successful at the first attempt in 95% of the patients. 5 cases required intubation. One was changed by another size. The mean time for successful insertion was 14,4+/- 4,4seg. The mean leak pressure was 25,1+/-6 cmH2O. The mean positive pressure needed to achieve a tidal volume of 8 ml/kg was 14,8 +/- 3 cmH2O, with a plateau pressure of 10,8 +/- 2,6 cmH2O. Gastric tube placement was easy achieved in all cases. No episode of desaturation (SpO2 $<$ 90%), bronchospasm or laryngospasm. was recorded.

Conclusion: Ease of insertion and the values of airway leak pressure found in I-gel allow for effective ventilation in almost all cases. The I-gel seems to be safe for pediatric population and a reasonable alternative to airway management.

References

1 L. Beylacq, The I-gel a single-use supraglottic airway device with a non-inflatable cuff and an esophageal vent: an observational study in children. Acta.

2 Soh CR, Ng ASB. Laryngeal mask airway insertion in paediatric anaesthesia: comparison between the reverse and standard techniques. *Anaesth Intensive Care* 2001; **29**: 515–519.

3 Chul Ho Chang, Optimal conditions for Laryngeal Mask Airway insertion in children can be determined by the trapezius squeezing test. *Journal of Clinical Anesthesia* (2008) **20**: 99–102.

Paper No: 1166.0

Laryngeal mask size in overweight children: actual vs. ideal weight formula

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Introduction: The actual weight of the child (in kilograms) has conventionally been used to select the size of LMA in both normal weight and overweight children. Based on our observations in overweight children, we hypothesize that patient's actual weight may not accurately predict LMA size in this patient population.

Objectives: To determine whether overweight pediatric patients require LMA size other than recommended size significantly more often than normal weight pediatric patients. Methods: Investigators will perform a retrospective review of the anesthetic records of patients aged 2-12 years who received general anesthesia with LMA at Children's National Medical Center. Consecutive anesthetic charts will be reviewed beginning from the 1st of January 2010 until the predetermined sample size of 70 for each group is achieved. Exclusion criteria include non-elective surgeries, inadequate demographic information and underweight patients. The patient's age, weight, height, BMI and size of LMA actually used were recorded. For comparative analysis, the actual LMA size used will be compared with the predicted LMA size using the standard weight-based formulae. BMI percentile of each patient is determined by using Center for Disease Control and Prevention's BMI percentile calculator for child and teen: http://apps.nccd.cdc.gov/dnpabmi/ Less than 15, 15-85 and $>$ 85 percentiles are considered underweight, normal weight and overweight respectively. Incidence of overweight pediatric patients required LMA size other than

recommended size will be compared with that of normal weight patients. Results and conclusion are pending.

References

1 Kim HJ. *Appropriate laryngeal mask airway size for overweight and underweight children. Anaesthesia.* **2010**; **65**: 50–53.

Paper No: 1171.0

Efficacy of thromboelastography-guided administration of fibrinogen in paediatric cardiopulmonary bypass surgery

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Introduction: Suitable levels of fibrinogen are necesary for a satisfactory hemostasis. The coagulopathy associated to paediatric cardiopulmonary bypass (CPB) is very complex and is accompanied by hypothermia, hemodilution, platelets impaired, excessive fibrinolysis and high consumption of coagulation factors.
Objectives: The aim of the study is to review the effectiveness of fibrinogen administration to recover basaline levels and decrease postoperative bleeding. Methods After ethical committee approval and informed consent, we prospectively studied 40 children undergoing CPB, between 27 days to 5 years old and weights 4-15 kgs. Clinicians were blinded to the hemostatic assays above routine use, i.e., TEG (R) (Thromboelastography). Exclusion criteria included the following: basal coagulopathy, previous anticoagulants treatment, redo cardiac surgery, extended CPB ($>$ 120minutes) and cyanotic congenital defect. TEG (R) and standard coagulation test were performed inmediately after blood sampling. Blood for TEG (R) profiles was collected at 3 time points: inmediately before CPB, end of CPB before separation (rewarming complete, before protamine administration) and after separation from CPB (after protamine administration).
Results: After administration of fibrinogen in the postoperatory period, it reached normal state and there was only excessive bleeding and coagulation impaired in TEG (R) in one case, associated with low plasmatic fibrinogen levels and alteration of EXTEM that improved with the administration of blood products (fibrinogen and coagulation factors). Discussion As previously described by Rahe-Mayer N et al. in aneurysm surgery we observed in pediatric CPB that correction of plasmatic levels of fibrinogen may be associated to a satisfactory hemostasis and a postoperatory bleeding reduced. TEG(R) is a useful technique to assess the requirements of blood products in the children undergoing CPB.
Conclusions: Administration of fibrinogen was effective to increase fibrinogen plasmatic levels and contributed to correct the bleeding after CPB in pediatric cardiac surgery, associated to lower disturbances of coagulation state.

References

1 Eaton MP, Lannoli EM. Coagulation considerations for infants and children undergoing cardiopulmonary bypass. *Pediatric Anesthesia* 2011; **21**: 31–42.
2 Rahe-Meyer N, Solomon C, Winterhalter M, *et al.* Thromboelastometry-guided administration of fibrinogen concentrate for the treatment of excessive intraoperative bleeding in thoracoabdominal aortic aneurysm surgery. *J. Thorac. Cardiovasc. Surg.* 2009; **138**: 694–702.
3 Moganasundram S, Hunt BJ, Holton F, *et al.* The relationship among thromboelastrography, hemostatic variables, and bleeding after cardiopulmonary bypass surgery in children. *Anesth. Analg.* 2010; **110**(4): 995–1002.

Paper No: 1181.0

Evaluation of the FLACC scale as a postoperative pain assessment of young children underwent day-surgery

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Introduction: Young children frequently lack the verbal and cognitive skills to express pain and discomfort. This difficulty in assessment may lead to under-treatment of pain in young children. The FLACC is one of pain assessment scales for toddler-preschool children scoring distress behaviors. It includes facial expression, leg position, motoric restlessness, crying and consolability 1), which is scored from zero to two respectively. The CHEOPS (Childrenfs Hospital of Eastern Ontario Pain Scale) is also well-known as pain assessment scale for young children. This consists of six categories scored from zero to three.
Objectives: We evaluated the FLACC scale as a postoperative pain assessment of young children underwent day-surgery.
Method: Twenty-six operation theater nurses were involved. They individually scored infant-preschool children who received inguinal-hernioplasty when they were in charge of recovery room. They answered questions about usefulness and difficulty of assessment. Operation was performed under general anesthesia with nitrous oxide and sevoflurane with ilioinguinal-iliohypogastric nerve block. Children stayed in recovery room with their parents.
Results: These were questions. Is the FLACC scale useful for assessment of postoperative pain of young children? (YES 18, NO 6) What age is most suitable for this scale? (toddlers:3, preschool age:12, school age:5, 0-7 years old:8) Which behavior was difficult to judge? (face:11, legs:7, activity:8, cry:7, consolability:6) What was the most difficult part of assessment? (distinguish pain from agitation or

discomfort, evaluate terms to express frequency, evaluate facial expression).

Discussion: Most nurses appreciated the FLACC was useful and preferable to assess post-operative pain of young children in recovery room. A half of them felt difficulty to distinguish pain from agitation or discomfort. Some of them felt discrepancy between their scoring results and vague impressions. However they appreciated behavioral scoring as an objective assessment. English to Japanese translation of categories may blur a subtle distinction of expression2). In the view of practicability, the FLACC sacle, which is consist of five categories and zero to two scoring, is simple and easy to memolize in a busy clinical setting2).

Conclusion: The FLACC score was evaluated as a useful pain assessment method for post-operative pain in recovery room by nurses.

References

1 Merkel S, *et al.* The FLACC: A behavioral scale for scoring post-operative pain in young children. *Pediatr Nurse*. 1997; **23**(3): 293–297.

2 Suraseranivongse S, *et al.* Cross-validation of a composite pain scale for preschool children within 24 hours of surgery. *Br J Anaesth*. 2001; **87**: 400–405.

Paper No: 1217.0

Postoperative analgesia after caudal anaesthesia with Bupivacaine in children: Clonidine versus Tramadol

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Introduction: Caudal epidural blockade provides analgesia beyond the duration of surgery, a smooth recovery period and good postoperative pain control (1). Caudal Bupivacaine (2) has been widely used for years in children but the major problem was the limited duration of analgesia. Recent research has focused on trying to resolve this problem with the addition of various adjuncts. Clonidine was found to potentiate and prolong the analgesic effect of the local anaesthetic(3,4).other authors have found similar effect with addition of Tramadol without producing significant adverse effects.(5,6,7,8).

Objectives: Our aim was to compare the analgesic effectiveness of Tramadol and Clonidine as additives to caudal Bupivacaine.

Methods: We examined in a prospective, randomized, double-blind study, 45 children aged 1 to 6 years, ASA I, who were scheduled to undergo urogenital surgery during the period January to July 2011.

Children were randomized to one of three study groups (n = 15) to receive the following in a single shot caudal administration before surgery: Group B: control group (Bupivacaine 0, 25%) 2, 5 mg/kg +saline, 2 mg/kg Tramadol Group BT or Clonidine 2 ug/kg Group BC. After wake up children were supervised each 2 hours during 24 hours to assess postoperative analgesia using paediatric objective pain score(OPS), supplement analgesic drug need, sedation using a 5-point scale and side effects .

Results: The OPS average score was significantly lower in Tramadol group (0,27; P = 0,002) and in Clonidine group (0,53; P = 0,026) than Bupivacaine group. The mean time to the first administration of postoperative rescue analgesia was 8,03 ±8,5 hours in group B, 18,73 ± 7,8 hours in group BT(P = 0,007) and 13,07 ± 10,66 hours in group BC P > 0,05). The total taken dose of Paracetamol per Kg during the first day after surgery was significantly lower respectively in Tramadol-Bupivacaine group 7,2 ± 11,1 mg/kg (P = 0,004) and Clonidine –Bupivacaine group 12 ± 15 mg/kg (P = 0,04) than in the Bupivacaine group 25,4 ± 16,8 mg/kg .

The sedation scores were less than 2 in all patients. The incidence of nausea and vomiting wasn't significantly different among group.

Conclusion: Our results indicate that caudal Tramadol enhances the effects of Bupivacaine in terms of duration of postoperative analgesia. It gives more pain free period compared with Clonidine without increasing the incidence of adverse effects.

References

1 Dalens BJ. Regional anesthesia in children. In: Miller RD, ed. Anesthesia, 5th edn, volume 2. Philadelphia, PA: Churchill Livingstone Inc., 2000: 1549–1585.

2 De Beer DA, Thomas ML. Caudal additives in children – solutions or problems? *Br J Anaesth* 2003; **90**: 487–498.

3 Ansermino M, Basu R, Vandebeek C, Montgomery C. Nonopioid additives to local anaesthetics for caudal blockade in children: a systematic review. *Paediatr Anaesth* 2003; **13**:561–573

4 Schnabel A, Poepping DM, Kranke P, Pogatzki-Zahn EM, Zahn PK Efficacy and safety of caudal clonidine for pediatric anaesthesia: A quantitative systematic review of randomised controlled trials. Best Abstracts - Runner-up Session 1 (euroanesthesia congress 2011).

5 Lee CR, Mc Tavish D, Sorkin EM Tramadol. *Drugs* 1993; **46**:313–340

6 Senel AC, Akyol A, Dohman D, *et al.* Caudal bupivacaine-tramadol combination for postoperative analgesia in paediatric herniorrhaphy. *Acta Anaesth Scand* 2001; **45**:786–789.

7 Delilkan AE, Viyajan R. Epidural tramadol for postoperative pain relief. *Anaesthesia* 1993; **48**:328–331.

8 Meena Dota, Sambrita Mukherjeee. Postoperative analgesia in children-comparative study between caudal Bupivacaine and bupivacaine and Tramadol. *Indian j anesthesia* 2009; **53**(4):463-466.

Paper No: 1233.0

Ketofol (Ketamine/Propofol) vs Ketamin/ Midazolam in babies for short-term orthopaedic procedures

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Introduction: Ketamine produces dissociative anaesthesia and extensive analgesia, which safely and effectively enables treatment for a wide variety of short, painful, surgical or critical care procedures.
Objectives: This study is designed to determined the differences of accommodation of ketamine dissociative effect and agitacion in babies anaesthesied with ketamin/midazolam and ketamine/propofol combination for non sanquinea hip reposition. Methods: With approval of Ethics Commity 41 babies (3-7 months), ASA I, with luxatio coxae congenita scheduled for non sanquinea hip reposition under general anaesthesia. They were divided in two groups, Group A(n = 21) anaesthesied with Ketamine/Midazolam, and group B (n = 20)anaesthesied with Ketofol (Ketamine/Propofol) combination. All the patients were premedicated i.m with Midazolam 0,15 mg kg-1 and 0,015 mg kg-1 Atropin. In Group A maintance of anaesthesia was established with i.v koktel combination of Ketamine – Midazolam (1ml = 0,5 mg Midazolam +10 mg Ketamine) 0,3 – 0,4 ml kg -1 . In Group B maintance of anaesthesia was established with koktel combination of i.v Ketamine 0,3 -0,4 mg kg -1 and Propofol 0,2 mg kg -1 . The patients were monitored noninvasively (BP, pulse, SpO2), and they were active oxygen supported during the intervention.
Results and Discussion: Seven (33,3%) babies from Group A showed unsatisfactory relaxation and agitation during the maintance of anaesthesia. Growing the dose of Ketamine/Midazolam the excitacion was the biggest. Propofol 0,5-1,0 mg kg-1 accommodated this effect. The maintance of anaesthesia at the babies from Ketofol group was significantly stable with satisfactory relaxation and without agitation compare with Group A.
Conclusion: The anaesthetic and analgesic properties of Ketofol, satisfactory relaxation, without agitation and antiemetic profile of this combination provides better conditions at the babies for short term operative and nonoperative procedures compare with effect of ketamin/midazolam koktel combination which is not always sufficient at the babies to accommodated ketamin agitation status and produced sometimes midazolam-delaying postoperative respiratory depression effect.

References

1 Rae Frances Bell. Ketamin for non-cancer pain (topical review). *Pain* (2009) 1-5.
2 Lin C, Durieux E.Ketamine and kids:an update.Paediatric anaesthesia, 2005; **15**: 91-97.
3 Koining H, Marhofer PS. (+)ketamine in paediatric anaesthesia. Paediatric anaesthesia, 2003 **13**: 185-187.

Paper No: 1249.0

A case of horner's syndrome after internal jugular venous catheterization in a child

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Introduction: Horner's Syndrome (HS) is characterized by a tryad of miosis, ipsilateral ptosis and facial anhydrosis as a result of a lesion occurring at any given point of the oculosympathetic pathway between the hypothalamus and the eye(1). Although rare, there are, however, a few reports of this syndrome occurring in the sequence of the internal jugular vein catheterization(2).
Objectives: We report a case of Hs postoperatively following IJV catheterization in a child.
Methods: Four years old subject, male gender, ASA physical status P3, weighing 19Kg, admitted for a cardiac septoplasty under general anesthesia due to a partial AV septal defect. After the induction, the child was positioned for right internal jugular catheterization with a Trendelemburg tilt without head rotation. Two attempts were undertaken with a medial approach, inadvertently puncturing the carotid artery, immediately followed by direct compression. The left jugular vein was then cannulated on a first attempt, using the same approach. Anesthesia maintenance and emergence went on without any events worthy of note.
Results: In the immediate postop period, the child presented with a smaller right pupillary diameter and ipsilateral partial ptosis. After a Pediatric Neurology consult, a normal head CT and a carotid Doppler exam with no abnormalities, the diagnosis of HS was considered and assumed, despite total clinical regression in a 3 weeks period.
Conclusion: The proximity between the cervical sympathetic pathway and the internal jugular vein may predispose it to lesions, either by direct needle trauma or owing to pressure exerted by an expanding local hematoma resultant from an inadvertent carotid artery puncture(1). In what it relates to the present clinical case, the findings, particularly the sudden onset, point to the HS being a result of the ipsilateral jugular vein catheterization, underlining that an ultrasound-guided puncture was not ensued due to a momentary lack of availability(2). This case report, therefore, emphasizes the importance of ultrasound monitoring and guidance of central venous cannulation.

References

1 *Journal of Clinical Anesthesia* 2008; **20**: 304-306.
2 *Pediatric Anesthesia* 2007; **17**:(4), 396–398.

Paper No: 1272.0

Modification of the Predicted Difficult Airway Algorithm using AIRTRAQ laringoscope

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Introduction: Difficult airway management in paediatric population remains as one of the most important challenge for the paediatric anaesthesiologist because of lethal consequences
Objective: Determine the efficacy of optical laryngoscope Airtraq® in the Predicted Difficult Airway Algorithm in paediatrics and find its place within our institutional modified paediatric airway algorithm. Determine its effectiveness as a first maneuver in cases of known difficult airway.
Methods: After obtaining written informed consent of 194 paediatric cases we performed indirect laryngoscopy using Airtraq. One hundred and sixty eight of the children apparently normal with no difficult airway predictors, sixteen premature infants of less than one kilogram and ten patients with predicted difficult airway management. After routine monitoring of the children we performed the following airway management scheme: First option, "first look" indirect laryngoscopy with Airtraq®, second option, flexible bronchoscopy, third option, Supragloticc devices (both laryngeal mask or laryngeal tube if recue was necessary) Inhalatory induction was performed with Sevorane® to canulate an intravenous access continouing with total intravenous with propofol and remifentanil maintaining spontaneous ventilation in all cases throughout the process. Muscle relaxants were not used in any patient.
Results: We achieved succesful first attempt intubation, even in unexperienced hands with the AIRTRAQ in 81% of cases. To ease intubation we used maneuvers to improve the exposure of the glottis and then ninety nine percent of the children were intubated in the first thirty seconds with no respiratory complications. Only one patient required the use of flexible BFC through Airtraq®
Conclusions: Airtraq® laryngoscope is an effective device in airway management in the pediatric population, used as a rescue to the standard management laryngoscope or as we propose, recovering laryngoscopy in the diagnosis of cases of VAD known.

Paper No: 1276.0

Propofol and sevoflurane tubeless anaesthesia for infant laryngeal laser surgery: case report

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Introduction: Infant laryngeal laser surgery is challenging for both the anaesthesiologist and the otolaryngologist. The small diameter of the airways, propensity of rapid dessaturation and risk of airway fire (1) obliges close collaboration between teams. For neonates and small infants there are no laser safe tracheal tubes available (2). The choice of an adequate anesthetic technique is always difficult in this context. Several different methods have been described with multiple advantages and disavantages.
Objectives: describe successful rarely described anesthetic approach in a rare surgery in the infant population.
Methods: Case report Infant 14 months, feminine, 8,9 kg, ASAIII was scheduled for correction of laryngo-tracheal fissure. His medical history was significant for laryngo-tracheal fissure, tracheoesophageal fistula, malformation of carina, tracheomalacia of the middle 1/3 of the main left bronchus, frequent respiratory infections and interventricular communication in spontaneous closure. His past surgical history included esophageal atresia correction on the second day of life. Anesthetic technique: ASA Standard II monitoring. Induction with sevoflurane 8%, manteining spontaneous breathing. Direct laryngoscopy was performed, Cormack Lehane grade I visualization. A flexible metal endotraqueal tube was positioned in the oropharynx directed to to glotic strutures. Hydrocortisone 25mg was administered. Maintenance was performed using propofol 1% at 3,56ml/h and sevoflune with oxygen Fi 30%, fentanyl bolus total of 0,006 mg. At 1h15min of intervention a blood gas analysis was performed and no abnormal parameters were encountered. Fluid Therapy with normal saline 20 ml/h, glicose 5% 38 ml/h. Analgesy paracetamol 140 mg intravenous. Total duration of the procedure 2h 15minutes.
Results: The combination of a propofol perfusion and Sevoflurane during manteinance was able to accomplish an adequate anesthesia and optimal surgical field, with sponteneous breathing.
Discussion: Several different methods have been described with multiple advantages and disavantages. Apart from the anesthetic technique chosen, clinical monitoring is vital in this context. Monitoring respiratory adequacy can be challenging, as capnography is not possible, and the visibility of abdominal excursion limited. We used the television surgical monitor as part of the anaesthesia monitoring during the procedure as laryngospasm could had been visible before desaturation occurred and rapidly treated. Blood gas analysis may be helpful in procedures with more than 1 hour.
Conclusions: The major advantage of this technique was diminish the requirement of Fi sevoflurane, possibility decreasing pollutant environment. Propofol perfusion can be used in case of laryngospasm to deepen anesthesia due to his rapid onset of action independent from alveolar ventilation.

References

1 *Pediatric Anesthesia* **20**: 434-438
2 *Pediatric Anesthesia* **17**: 942-947.

Paper No: 1277.0

Pierre Robin sequence urgent tracheotomy: case report

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Introduction: Pierre Robin sequence is a rare disorder with a high degree of anesthetic risk. Difficult airway should always be anticipated. (1,2)
Objectives: Report how we successfully approached this situation and discuss the different pathways we could have followed.
Methods: A 14 day premature neonate female, ASA IVE with Pierre Robin sequence was scheduled for urgent tracheotomy. His medical history was significant for respiratory distress admitted in the intensive care unit (ICU) since birth. Intubation was attempted several times without success; by senior Paediatric Intensivist, senior anesthesiologist, with direct laryngoscopy; and by ENT specialist using a rigid endoscope. At day 14 of life clinical situation deteorated. Orotraqueal intubation was attempted but with no success, resulting in a cardio respiratory arrest. She was brought to our hospital to perform an urgent tracheotomy.
On physical examination heart rate 185beats/minute; respiratory rate 50 cycles/minute; oxygen saturation 98% (oxygen delivery 3-4 liters/min by nasal cannula); evident sternal and costal retraction, nasal flaring; micrognathia; cleft palate and global hypotonia. Respiratory auscultation with disperse wheezes. From the perioperative assessment a difficult airway was anticipated. Airway approach was discussed between anesthesiologists and otolaryngologists. Difficult airway equipment ready and Adrenalin, atropine and ketamine prepared. The hospital neonatal fiberscope has not a available. Direct laryngoscopy would be not attempted, the airway was to be secured with I-gel mask size 1.
The newborn was transported to the operating room maintaining spontaneous breathing in lateral decubitus. Transferred to the table, in prone position, desaturation and bradycardia occured with new cardiorespiratory arrest. Life support was initiated, and 1 mg ketamine IV administered; ventilation with facial mask was extremely difficult. Reversion was achieved. A I-gel mask 1 was inserted, manual ventilation kept with oxygen and sevoflurane. Surgery started. During tracheotomy the newborn suffered a new arrest, chest compressions started along with 1 mg ketamine plus 0,01 mg adrenaline intravenous. Reversal was achieved.
Results: The child recovered, surgery was accomplished with success. She left the ICU within four days, returning to the origin hospital
Discussion: Few reports are available reporting Pierre Robin sequence in urgent surgery to achieve success in emergency situations is critical to anticipate the problems, define a clear strategy, organize the team, prepare in an accessible way all the drugs and equipment.
Conclusions: I-gel Laryngeal mask presents as a valuable option in this scenario. Ketamine regarded as a second line drug prove to be a valid choice in an emergence situation.

References

1 *Paediatr Anaesth.* 2009 Apr;**19 (4)**:409–10.
2 *Acta Anaesthesiol Scand.* 2008 Oct;**52 (9)**:1307–8.

Paper No: 1284.0

Pharmacokinetics of oromucosal midazolam hydrochloride in children

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Introduction: Midazolam, a benzodiazepine with a rapid onset and short duration of action, is a well-established premedication agent.1,2 When administered oromucosally, midazolam is rapidly absorbed across the mucous membranes into the bloodstream.3 Midazolam is primarily metabolised by hepatic cytochrome P450-3A4 isoenzyme to its metabolite, 1 hydroxy midazolam.
Objectives: To determine the pharmacokinetic (PK) profile of a single dose of midazolam hydrochloride administered oromucosally to children and adolescents aged 3 months to $<$ 18 years requiring pre-medication before routine elective surgery. Safety was a secondary objective.
Methods: Midazolam hydrochloride solution (5 mg/ml) was administered at a dose of $\sim$0.2 mg/kg (up to a maximum 10 mg). The protocol was approved by the Institutional Review Board and consent obtained from both parents. The PK profile for midazolam and 1 hydroxy midazolam was determined by mathematical modelling of the concentrations measured in blood samples drawn from a venous cannula. Samples were taken as soon as possible post-dose and up to five further blood samples were taken during the following time windows: 20-30, 30-40, 40-50, 50-60, 60-120, 120-240, 240-360 and 360-480 min. Safety was evaluated from vital signs and adverse events (AEs), including oromucosal irritation.
Results: Fifty-three patients were enrolled and fifty completed the study. A total of 263 venous blood samples were analysed. Midazolam hydrochloride was absorbed rapidly, achieving a mean maximum concentration (Cmax) of 73.2 ng/ml approximately 24 min after dosing; there was

no significant correlation between Cmax and age or weight. The mean area under the curve (AUC) for midazolam was 130.5 ng/ml·h; weak positive correlations between AUC and age ($r2 = 0.55$) and weight ($r2 = 0.48$) were observed. The distribution and elimination half-lives (t1/2) of midazolam were 26.7 and 203.7 min, respectively. The metabolite 1 hydroxy midazolam was rapidly formed, with a Cmax of 20.7 ng/ml reached at approximately 50 min; the mean t1/2 for 1-hydroxy midazolam was 19.9 min. Similar pharmacokinetic values have been previously reported for oromucosal midazolam in healthy adults (Cmax 55.9 ng/ml; Tmax 30 min; t1/2 143 min).4 Two nausea-related AEs were considered to be related to the study medication. No serious AEs were reported. There were no reports of oromucosal irritation throughout the study period.

Conclusions: Buccal midazolam is rapidly absorbed and eliminated, even when compared with other application forms and other benzodiazepines, including diazepam.5 Pharmacokinetic parameters indicate that oromucosal midazolam hydrochloride is suitable to use when a rapid onset and recovery are required.

References

1 Pieri L *Br J Clin Pharmacol* 1983; **16**(Suppl 1):17S–27S.
2 Karl HW, *et al. Anesthesiology* 1993; **78**(5):885–891.
3 Scott RC, *et al. Epilepsia* 1998; **39**(3):290–294.
4 Schwagmeier R, *et al. Br J Clin Pharmacol* 1998; **46**(3):203–206.
5 Cloyd JC, *et al. Epilepsia* 1998; **39**(5):520–526.

Paper No: 1285.0

A Neonate with Pierre Robin Sequence and Stickler Syndrome

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Introduction: Cleft lip and palate are the most common craniofacial anomalies, occurring in 1/800 births. Of the greater than 150 conditions associated with cleft palate, Pierre Robin is amongst the most well-known. Robin sequence (RS) is characterized by the triad micrognathia, glossoptosis, and upper airway obstruction. Effected neonates may also present with cleft palate, feeding problems, and reduced hearing. It is uncommon, occurring in 1/30,000 births and does not appear to be hereditary. Greater than 50% of infants with RS have an associated syndrome, of which more than 40 have been described. Stickler syndrome (SS), an autosomal dominant connective tissue disorder that may affect 1/10,000, has been found in 11-18%. It is associated with facial, ocular, auditory, and articular abnormalities. There appears to be an increased incidence of cardiac defects. Case History Term twenty-one day old male with RS and SS was scheduled to undergo nissen fundoplication. The neonate was born to a healthy 26 year old G4P2A1 mother and required mechanical ventilation shortly after birth. He was extubated one day later and placed on nasal canula after an unsuccessful CPAP trial. TTE at 10 days demonstrated fenestrated atrial septum with 2 small ASDs and globally depressed LV function. Patient was documented as a difficult intubation when induced for the placement of a g-tube on day 11, likely owing to small size and retrupulsion of the submental area. Patient was transported from NICU with nasaopharyngeal airway and O2 saturation of 98% on room air. He demonstrated mild respiratory distress, with visible retractions of the intercostals and subcostals. Obvious micrognathia and low set ears were noted. A cleft palate and thick, short tongue were visualized (fig). Pulmonary crackles and a murmur were auscultated. Following preoxygenation, slow IV induction with lidocaine and propofol was performed to maintain spontaneous ventilation. Once the oropharynx was cleared of copious secretions, intubation proceeded using a fiberoptic laryngoscope and 3.0 ETT. Patient was given rocuronium and inhalational agent for maintenance of anesthesia. Neonate was extubated in the OR after full consciousness was regained and he was transported to the NICU with blow-by oxygen.

Conclusion: Airway management in a patient with cleft palate can be a challenge. When a child presents to an anesthesiologist with RS, this challenge is compounded by the multiple congenital oral anomalies. Anticipating a difficult intubation is imperative to preclude unforeseen morbidity.

References

1 Breugem CC, Mink van der Molen AB. What is Pierre Robin sequence? *Journal of Plastic, Reconstructive and Anesthetic Surgery* 2009; **62**: 1555–58.
2 Evans KN, Sie KC, Hopper RA, *et al.* Robin Sequence: From Diagnosis to Development of an Effective Management Plan. *Pediatrics* 2011; **127**: 936–48.
3 Gunawardana RH. *Difficult laryngoscopy in cleft lip and palate surgery. Br J Anaesth* 1996; **76**:757–9.
4 Hatch DJ. Airway Management in cleft lip and palate surgery. *Br J Anaesth* 1996; **76**: 755–6.
5 Lansford, Michelle. Focus on the Physical Assessment of the Infant with Stickler Syndrome. *Advances in Neonatal Care* 2008; **8**: 308–14.

Paper No: 1296.0

Efficacy and safety of the reversal with sugammadex in deep neuromuscular blockade induced by rocuronium in pediatrics

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Introduction: Muscle relaxants have a long duration with the posibility of residual muscle relaxing and ventilatory

problems after surgery. Sugammadex (Bridion(R), is the only antagonist able to encapsulate and fully eliminate the muscle relaxant to avoid residual effects and respiratory complications. Sugammadex reverses neuromuscular blockade at all depth levels, dose-dependent. At present, there are not enough clinical trials using sugammadex in paediatric population.

Objectives: The aim of current study is to compare the efficacy and safety of reversal with sugammadex versus neostigmine, in paediatric patients with deep blockade (No TOF and $<$ 2PTC responses) induced by rocuronium.

Methods: Multicenter clinical trial, safety-assessor blinded study, phase III, prospective, randomized, parallel group, compared with conventional treatment, in dosage indication "out of technical label". With financial support by means of a Spanish Health Ministry grant, after ethics committees aproval, and parents signed informed consent obtained; 30 patients 2-11 years scheduled for short length surgery under general anaesthesia and muscular relaxation with rocuronium 0.6 mg/kg. were enrolled. Patients were randomized included in two groups of 15 patients each one. Group I: EXPERIMENTAL.- Reversal from deep blockade (PTC $<$ 2-3) with sugammadex 4 mg/kg. Group II: CONTROL.- Reversal from deep blockade (PTC $>$ 2-3) with the conventional reverse treatment, neostigmine 0.05 mg/kg and atropine 0.025 mg/kg. In all patients neuromuscular function was monitored by acceleromiography (TOF-Watch (R)). We define response to treatment, as the fast recovery of neuromuscular function (T4/T1 $>$ 0.9). The ventilatory support and anesthetic technique was mantained until recovery of neuromuscular function, with subsequent extubation. Main outcome variable was time from begining of administration of sugammadex or neostigmine to reach a T4/T1 $>$ 0.9. Statistical analysis with SPSS 17, using t-Student for independent samples, significance was reported at $p < 0.05$.

Results: The groups were similar in terms of demographic (age, weight), surgical (length of surgery), and relaxing effects (rocuronium onset, maximum blockade, etc.) with no statistically significant difference. Group I achieved complete reversal (Time at T4/T1 $>$ 0.9: 1.11 ± 0.3 min.), Group II (9.66 ± 1.2 min.), $p < 0.05$. Time at extubation, sugammadex (2.07 ± 0.5)min, neostigmine (14.19 ± 2.7)min, $p < 0.05$. No adverse effects were reported in group I. In group II, 3 cases lasted $>$ 20 minutes, 3 cases of bradycardia (HR decreased $>$ 20%).

Discussion: At present, there are not trials using sugammadex at high doses in deep blockade, in paediatric population. In our study we achieved a T4/T1 $>$ 0.9 in less time (71 vs 115 seconds) than Tufanogullari et al. with a dose of 4 mg/kg in adults.

Conclusions: Sugammadex 4 mg/kg reverses effective and safety deep neuromuscular blockade induced by rocuronium in paediatric patients over 2 years, undergoing elective surgery. This preliminary data shown sugammadex as fast and secure alternative to standard reversal by neostigmine.

References

1 Tufanogullari B, Klein K, White PF. Use of sugammadex to reverse rocuronium-induced neuromuscular blockade. *Anesthesiology* 2001; ASA Abstract AIII.

2 Plaud B, Meretoja O, Hofmockel R, *et al.* Reversal of rocuronium-induced neuromuscular blockade with sugammadex in paediatric and adult surgical patients. *Anesthesiology* 2009; **110**:289–94.

Paper No: 1307.0

Behaviour of nindex index during anesthesia on pediatric patients

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Introduction: The NINDEX index is a way to measure the anesthetic depth based on the EEF, commercially available since 2008 [1]. The NINDEX algorithm develops from a development database composed by EEG registries classified according to the Kugler anesthetic depth scale. It evolves within a cyclic adjustment process, which results in consecutive NINDEX versions developed over groups of data which are being more complete every day. The first and second versions of the NINDEX algorithm were developed based on adult patient registries. For the development of the 3.0 version, the development database was expanded by adding pediatric patient registries.

Objective: Evaluate the anesthetic depth and the NINDEX version 3.0 index behavior in pediatric population submitted to a deTIVA protocol. Methods A prospective observational study is done without specific therapeutic intervention in 32 pediatric patients from an average age of 7 ± 3 years old submitted to othorhinolaryngologic and general surgery with TIVA based on propofol and remifentanilo. The anesthetic induction is done with a propofol BOLO, followed by three stages of propofol infusion (according to the length of the surgery) in average 11, 8 and 6 mg/kg/h doses. The first two stages of infusion last between 10 and 11 minutes, and the third lasts until the end of the surgery. Reminfentanilo is used at 0,5 mg/kg/h during the entire procedure. The NINDEX-Notebook monitor is used with 3.0.14 software version and with ECG electrodes of SWAROMED trade name positioned according to developer's instructions. Data Processing A NINDEX chart of values is built during the following moments of every control: -Before induction (PREIND) -After induction (POSIND) -At first infusion change (DOSIS2) -At second infusion change (DOSIS3) -At the end of the infusion(CIERRE) -After awakening (DESPERTAR)

Results: Table number 1 shows the average and standard NINDEX detours at every considered instant and figure 1

Table 1

PREIND	PREIND	POSIND	DOSIS2	DOSIS3	CLOSURE AWAKENING NINDEX
98	1	36	10	61	9
66	9	72	7	90	4
Number of samples					
21	30	25	17	17	32

shows the corresponding graphic showing in grey the NINDEX range recommended for pediatric patients.

Conclusions: The NINDEX index ended up being reliable and safe, allowing precocious detection of anesthetic awakening. Simple to use and requires no expensive supplies. References.

References

1 "Descripción de tecnología, monitor NINDEX", Controles S.A y Dr. D. Cibils, 29 de abril de 2009.

2 "NINDEX-Notebook, Manual de Usuario", Controles S.A y Dr. D. Cibils, 28 de abril de 2011.

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PATIENT SAFETY, PRACTICE MANAGEMENT

(The names of the authors presenting each paper are shown in bold type)

Paper No: 2.00

Improvement in anesthesia-attributable mortality: an international, graphically revisionist perspective

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Introduction: Anesthesiology's success in improving patient safety was cited as a model for the rest of health care in the Institute of Medicine's 1999 report,1 without explicit documentation of the size or timing of the improvement. Whereas many assert that the anesthesia-attributable mortality rate decreased from 1:10,000 to 1:200,000 in the decade following US patient-safety initiatives begun in 1984,2 some believe the trend began before 1980, and still others question whether the rate truly changed.3

Objectives: To explore the temporal aspects of the mortality improvement, anesthesia mortality data were subjected to graphical and statistical methods. Methods Studies of anesthesia-related mortality conducted internationally during the past 60 years were examined for population-based data on death judged primarily due to anesthesia care ("anesthesia-attributable mortality"): 28 such studies,4 with widely differing study designs and populations, were identified. Where necessary, data were transformed to a common metric (probability of anesthesia-attributable death). For multi-year studies, the study's anesthesia-attributable mortality rate was associated with the midyear of the study. A log (base-10)-transformation was used to enable meaningful graphing with widely disparate mortality values. Mortality was graphed against year, and a linear regression line for trend computed. The data set was also subjected to attribute-data ('p-chart') statistical process control (SPC) chart analysis.

Results: Graphing of mortality rate against year revealed a rate improvement approaching two orders of magnitude, with widely disparate rates (even with log-transformation), with the regression line below 1:10,000 by 1970 and rates from individual studies approaching 1:200,000 in the early 1980s. The slope of the regression line differed from zero (i.e., true change over time) ($P < 0.001$). SPC chart analysis indicated that rate decreases occurred in the early 1960s and in early 1980s.

Conclusions: Widely disparate study designs preclude a definitive quantitative conclusion regarding the size and timing of a change in anesthesia-attributable mortality rate. However, a strong improvement trend is clearly present international data, predating the US patient-safety initiatives begun in 1984. That the trend is apparent despite growing knowledge in anesthesiology, as well as growing patient acuity and surgical complexity – both of which bias against identifying a lower rate over time – makes the trend even more remarkable.

References

1 Kohn LT, Corrigan JM, Donaldson MS . (eds) To Err is Human: Building a Safer Health System. Institute of Medicine Committee on Quality of Health Care in America. Washington (DC), National Academy Press, 1999

2 Cooper JB, Gaba D. No myth: Anesthesia is a model for addressing patient safety. *Anesthesiology* 2002; **97**: 1335–7

3 Lagasse RS. Anesthesia safety: model or myth? A review of the published literature and analysis of current original data. *Anesthesiology* 2002; **9**: 1609–17

4 Orkin FK, Longnecker DE. Anesthesia risk, in Longnecker DE, *et al.* (eds) Anesthesiology, ed New York, McGraw-Hill, in press: Table 25-3

Paper No: 15.00

Simple solutions reduce first case delays in the operating room

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Introduction: Approximately forty-two percent of hospital revenue is acquired through the operating room (1). Operating room first case delays are a common problem which may contribute to loss of revenue. In fact, a fifteen minute delay in the morning can easily result in an hour and a half delay by the end of the day (2). This may lead to avoidable overtime and a decrease in the number of cases completed daily. Additionally, these initial delays have the potential to cause a decrease in patient, staff, and physician satisfaction.
Objectives: It was identified that the major cause of delay was late arrival by surgeons. We investigated whether behavior modified with accountability could improve the surgeon's arrival time.
Methods: The Surgery-in-Chief sent an email notice telling the surgeons to arrive to the operating unit twenty minutes prior to the procedure start time. This would allow time for the physician to perform the pre-procedure requirements and enough time for identification of any issues upfront so problems could be resolved before delays begin. It would also allow time for the informal briefing between nursing, anesthesia, and surgeons. An example of the email: "Good Afternoon, As of 2:00pm today you have a scheduled 7:30am start time on Thursday 6/3/10 at HCC2 Surgical Suite/MIUU. All Attendings, please arrive in HCC2 Prep Area no later than 7:10am. Thank you, On Time Start Committee Members".
The arrival times of surgeons were recorded. Those who were habitually late were addressed by the Surgeon-in-Chief.
Results: In the first month of the program, the first case on time starts improved to 35% as compare to 19% from the previous year. By the sixth month, the first case on time starts improved to 80% as compared to 30% in the previous year.
Conclusion: These simple emails became the unlikely simple solutions to tackle first case delays. It has not been identified whether the daily reminders alone or the person sending the reminder resulted in the improvement. These results may be different at an institution where the Surgeon-in-Chief has varying degrees of authority. A private practice fee for service surgeon may not be as influenced as a Hospital or University employed surgeon who reports directly to the Surgeon -in-Chief.
Continued monitoring will also reveal whether the improvement in behavior is sustainable.

References

1 Healthcare Financial Management Association (hfma). Achieving Operating Room Efficiency through Process Integration. Available at: http://www.mckesson.com/static_files/McKesson.com/MPT/Documents/HFMAProcessIntegration.pdf. Accessed June 10, 2010
2 Malhorta V. What should anesthesiologists know about operating room management. *CMA*. 2006; **29**: S83–S88

Paper No: 25.00

Cook exchange catheter in difficult airway extubation

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Introduction: Cook airway exchange catheter is interesting to be used in early postoperative period when reintubation is expected to be difficult. After difficult intubations or maxilofacial surgery is difficult to predict complications such us postoperative edema, hematoma or laryngeal injuries, letting Cook airway exchange catheter to insure the airway permeability and adequate ventilation, once orotracheal or nasotracheal tube is retired.
Objectives: We describe a case of difficult intubation, where we are using an extubating technique described in literature, based on Cook airway exchange catheter.
Methods: A 40th years old man, ASA I, programmed to bilateral maxillectomy because of mandibular sarcoma. No signs of difficult intubation were appreciated in preoperative interview, excluding a restricted mouth opening$<$3cm. Nasal intubation with fibrobronchoscopy was made with awake patient, proceeding to induce with propofol, fentanyl and rocuronium. Previous to the surgery, tracheotomy was discarded. After 8 hours of balanced anesthesia with propofol and remifentanyl, he was discharged to Intensive Care Unit, maintaining the patient intubated for 24 hours due to edema and inflammation in mouth and tongue. 24 hours later patient was awaked and once he was conscious, to maintain airway safety, its permeability and an easy airway access in case of respiratory difficulty, 3 ml Lidocaine 2% were nebulizated, proceeding next to insert Cook airway exchange catheter and retire nasotracheal tube. Patient was breathing oxygen 2 litres spontaneously with Cook airway exchange catheter for 12 hours and once no signs of respiratory difficulty were checked, Cook tube was retired without any complication. 24 hours later patient was discharged to his room.
Conclusions: Postoperative extubation in patients with difficult intubation may associate a high morbimortality in cases of reintubation failure. In our case we decide to introduce Cook exchange catheter as a guide. It should provide a possible safe intubation, preventing risk of hypoxemia. Main described complications are tracheobronchial perforation, failure in tube reintroduction across exchanger, barotraumatism when jet ventilation is required... Cook exchange catheter lets to evaluate safely ventilation effectiveness after extubation, with not many complications and in some cases like this, avoiding patient a tracheotomy.

References

1 Cooper RM. The use of an endotracheal ventilation catheter in the management of difficult extubations. *Can J. Anaesth* 1996; **43**: 90–93

2 Moyers G, McDougle L. Use of the Cook airway exchange catheter in "brinding" the potentially difficult extubation: a case report *AANA J* 2002; **70**: 275–278

3 Benumof JL. Airway exchange catheters: simple concept, potentially great danger. *Anesthesiology* 1999; **91**: 342–344

Paper No: 34.00

Total Hip Arthroplasty and perioperative oral carbohydrate treatment

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Introduction: Performing surgery on patients that have fasted over night has several disadvantages. Insulin resistance and prolonged length of hospital stay are just two of them (1-3).
Objectives: The aim of this randomized controlled trial was to determine whether pre and post operative intake of carbohydrates (CH) could reduce discomfort for patients undergoing total hip arthroplasty (THA).
Methods: This study was approved by the local Research Ethics Committee. Sixty consecutive patients scheduled for THA were enrolled. They were randomly allocated in a double blind way to either a 12.5% CH oral solution or water(4). To ensure that the groups were double-blind the placebo group received flavoured water (5). Four hundred mL of these solutions were administered 90 min before induction of anaesthesia and 2 hrs after the end of surgery. All patients received intrathecal anaesthesia with bupivacaine 15 mg. Patients scored their subjective sense of discomfort and pain using a 100 mm visual analogue scale. The extreme boundaries of the variable being measured were at each end of the scale (5). Variables measured at pre defined times were: anxiety, hunger, nausea, pain, thirst, tiredness and headache. Venous blood samples were drawn at pre defined times and analyzed for plasma concentration of haemoglobin, glucose, albumin and creatinine. Short Portable Mental State Questionnaire (SPMSQ) was used to asses the patients cognitive function. Length of hospital stay (LOS) was defined as time from end of surgery until discharge from ward.
Results: There were no statistically significant differences in LOS, anxiety, thirst or demographic data between the groups. The patients who received placebo felt more hunger pre operatively compared to the CH group. Pain scores were lower in the CH group at 12, 16, 20, 72 and 84 hrs post operatively. Patients in the CH group were more tired from day two and onward. In the placebo group patients felt more nausea pre operatively and at 36 and 48 hrs post operatively. There were no differences in SPMSQ or the parameters analyzed from the blood samples.
Conclusions: In orthopedic surgery it has been shown that patients undergoing THA develop insulin resistance resulting in a reduction of glucose uptake (1). This has been found to be an independent factor determining LOS (2). This study could not confirm this. Furthermore our study found no (or clinically insignificant) differences between parameters monitored. Administering oral CH in the perioperative period results in limited benefits to THA patients.

References

1 Soop M, Nygren J, Myrenfors P, Thorell A, Ljungqvist O. Preoperative oral carbohydrate treatment attenuates immediate postoperative insulin resistance. *Am J Physiol Endocrinol Metab.* 2001; **280**: E576–83

2 Thorell A, Nygren J, Ljungqvist O. Insulin resistance: a marker of surgical stress. *Curr Opin Clin Nutr Metab Care.* 1999; **2**: 69–78

3 Nygren J, Thorell A, Ljungqvist O. Preoperative oral carbohydrate nutrition: an update. *Curr Opin Clin Nutr Metab Care.* 2001; **4**: 255–9

4 Nygren J, Thorell A, Jacobsson H, *et al.* Preoperative gastric emptying. Effects of anxiety and oral carbohydrate administration. *Ann Surg.* 1995; **222**: 728–34

5 Hausel J, Nygren J, Lagerkranser M, *et al.* A carbohydrate-rich drink reduces preoperative discomfort in elective surgery patients. *Anesth Analg.* 2001; **93**: 1344–50

Paper No: 42.00

Tee clarify the cause of cardiovascular collapse during scoliosis surgery in a child

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Introduction: Posterior spinal fusion surgery with prone position, may be associated with important physiologic cardiovascular changes1 We report a case of a patient who developed cardiovascular collapse, increased central venous pressure (CVP), and massive bleeding during posterior spinal fusion surgery. Case Description Parents' informed consent and Institutional Ethic Board approval was obtained. A 14 year old male, otherwise healthy, with idiopathic scoliosis was scheduled for posterior spinal fusion surgery. There was marked narrowing of antero-posterior (AP) chest diameter. The patient underwent general anesthesia with endotracheal intubation, prone position with transverse bolsters in the chest and pelvis. One hour into surgical dissection and insertion of pedicle screws, the patient developed massive bleeding (3,000 – 4,000 ml). The patient also developed severe

cardiovascular instability requiring to aborted the surgery. Trans-thoracic echocardiogram showed hyperdynamic biventricular function and normal morphology. Suspecting intraoperative right ventricular compression related with the prone position, we decided to perform trans-esophageal echocardiography examination (TEE). We found a structurally normal heart in supine position. In prone position and transverse bolster, we identified significant decrease in the RVOT diameter, which further worsen with pressure at the back. We also documented simultaneous changes in the CVP from 10 to 24 mm Hg.

Using longitudinal bolsters, we found appreciably less impact to the RVOT, RV size and flow, both with and without pressure to the back. The patient returned to complete his spinal fusion surgery 3 weeks later in the prone position using separate longitudinal supports on each side of the chest.

Discussion: TEE has documented decrease in the cardiac index and stroke volume with preserved ejection fraction in patients undergoing scoliosis surgery in prone position. These abnormalities are consistent with decrease in venous return possibly due to compression of the inferior vena cava. 2, 3 Two previous case reports have described severe hemodynamic instability related with prone position with transverse chest supports studied with TEE.4,5

We report a case that developed severe intraoperative hypotension with elevated CVP refractory to treatment. The RVOT obstruction was aggravated with compression on the back. These abnormalities were less evident with longitudinal bolsters. RVOT obstruction due to external pressure produced a pseudo-tamponade effect with an increase in the RV afterload, decrease in the RV compliance and secondarily an increase in the CVP. This increase in the CVP may be reflected in the epidural venous plexus explaining the massive bleeding in the first operation.

References

1 Edgcombe H, *et al. Br J Anaesth*. 2008; **100**: 165–83
2 Dharmavaram S, *et al. Spine* 2006; **31**: 1388–1393
3 Toyota S, *et al. J Clin Anesth* 1998; **10**: 32–35
4 Soliman DE, *et al. Can J Anaesth* 1998; **45**: 925–32
5 Alexianu D, *et al. Anesth Analg* 2004; **98**: 334–5

Paper No: 67.00

The usefulness of a separate informed consent process for anaesthesia services in a Caribbean public hospital

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Introduction: Informed consent for surgery is both an ethical as well as legal obligation. Professional guidelines require that expressed informed consent should be obtained for any procedure. The role and usefulness of separate consent form for anaesthesia is contentious albeit there is no requirement in law. Studies have shown that many patients do not read or understand preprinted consent forms but sign them anyway. This study sought the relevance of a separate informed consent for Anaesthesia in a Caribbean country.

Objectives: To determine whether a separate written consent improved the adequacy of the informed consent process for Anaesthesia Services

Methods: A questionnaire study was conducted in adult patients undergoing elective surgery in a tertiary care public hospital in Trinidad. Patients were randomly categorized into two groups – Group-A was required to sign only the hospital's routine 'Consent for Operation' form, Group (B) additionally signed a separate Anaesthesia Consent form. Patients were interviewed postoperatively with an investigator-administered 5-point Likert-scale 8-item questionnaire to generate a composite 'adequacy of consent' index. Responses were analyzed between the groups with respect to gender, educational level, and grade of anaesthetist obtaining the consent.

Results: Two hundred patients were enrolled with 100 in each group. 61% were females, mean age was 44 years. 16% had tertiary education, 55% attended secondary school, 29% achieving a lower level of education. For Group A, the mean adequacy of consent index was 27.9 while for Group B, it was 30.6 ($p<0.001$). Gender, level of education, and grade of anaesthetist did not influence the adequacy of consent index. The signing of separate written consent had a positive impact on the patients' understanding of the nature and purpose of the anaesthesia procedures ($p=0.04$), their satisfaction with the adequacy of information provided about common side effects ($p<0.001$) and rare but serious complications ($p=0.01$).

Conclusions: In a Caribbean setting, the introduction of a separate written consent for anaesthesia improved the overall adequacy of the informed consent process. Patients signing a separate consent form were better informed about the nature and purpose of anaesthesia, common side effects and rare but serious complications.

References

1 White SM, Baldwin TJ. Consent for anaesthesia. *Anaesthesia* 2003; **58**: 760–774
2 Association of Anaesthetists of Great Britain and Ireland. Consent for Anaesthesia, Revised edition 2006. http://www.aagbi.org/publications/guidelines/docs/consent06.pdf
3 O'Leary CE. Informed consent for anesthesia: Has the time come for a separate written consent document? *ASA Newsletter* July 2006; **Vol 70**: Number 7

Paper No: 111.00

The Use of Simulation in Resident Training to Demonstrate a Decrease in Negative Airway Management and Related Outcomes

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Introduction: Senior residents were graduating without confidence in difficult airway management. Airway management was being taught by an older faculty who was not comfortable with newer airway management techniques. Other than fiberoptic laryngoscopy, not many other techniques were being taught.

Objectives: We were to design an airway rotation that decreases negative airway outcomes, and trains anesthesiology residents to become competent and confident in handling all airway scenarios. Our curriculum lacked the ability to combine multiple changing scenarios in real time, which could simulate an actual operating room experience. Adding simulation to our existing airway rotation will allow our residents to experience airway situations while managing the physiology and pharmacology of the patient.

Methods: The design involves CA-3 residents in their Airway Rotation. Two CA-3 residents undergo the rotation each month. One resident will use a simulator in addition to the basic curriculum and the other will get only the basic rotation. The curriculum consists of clinical and theoretical components. The clinical portion is operating room based, where residents secure the patient's airway with any modality other than a laryngoscope in three minutes. If the resident cannot secure the airway in three minutes, the Miller 3 blade must be used to intubate the patient. The residents are given "confidence" score cards. Residents are asked to grade themselves prior to the rotation on confidence with each airway device. The theoretical portion consists of textbook readings, peer reviewed articles, problem based learning discussions, and websites detailing bronchoscopy.The two groups of residents are reversed so that all residents benefit from simulation training. Cases between the two groups are assessed using outcomes criteria such as time to secure the airway, dental trauma, patient satisfaction (sore throat), and case cancellation. The change in resident skill level will be assessed by an objective structured clinical examination and oral exam. The change in confidence will be assessed by asking the residents to do a "post rotation" assessment of confidence utilizing the score card.

Results: The study was analyzed using chi-square contingency tables for each outcome. It was found that there were significant decreases in time to intubation and case cancellation. Patient satisfaction increased and there was no significant change in dental trauma statistics.

Conclusions: We conclude that simulation in airway management training may cause decreases in time to intubation and case cancellation while increasing patient satisfaction. Changes in these parameters may result in increased revenue for the instititution.

References

1 Lampotang S. Computer and Web-enabled Simulations for Anesthesiology Training and credentialing. *Journal of Critical Care* **23**: 173–178, 2008

2 Lampotang S. Human Patient Simulator Program/Research Lab, Brain Institute of University of Florida, 2007

3 Wayne DB, Butler J, Vidal! . Simulation Based Training of Internal Medicine Residents in Advanced Cardiac Life Support Protocols: A Randomized Trial, *Teaching and Learning in Medicine* Vol 17,. Issue 3, July 2005, 202–208

4 McGahe WC, Pugh CM, Wayne DB, Kyle RR, Murray WB, Clinical Simulation: Operations, Engineering and Management, Burlington, MA, Academic Press 2008

5 Van Meurs WL, Good ML, Lampotang S. Functional Anatomy of Full -Scale Patient Simulators, *Journal of Clinical Monitoring* 1997, **13**: 317–324

6 Levine RD, Straker T, Bastien A, Jindal M, Joseph VA, Decreased Complications after Introduction of an Airway Curriculum in an Academic Setting, *Abstract, American Society of Anesthesiology* 2008

Paper No: 118.00

Anesthetic Management of a patient with Acute Coronary Syndrome for hip fracture surgery

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Introduction: Acute coronary syndrome covers the spectrum of clinical conditions ranging from unstable angina to non-Q-wave myocardial infarction and Q-wave myocardial infarction. We describe the management of a patient with a hip fracture under regional anaesthesia. Method: A female 90 years old, ASA III, suffering from left intertrochanteric fracture with a medical history of chronic atrial fibrillation, arterial hypertension, diabetes mellitus type II, iron deficiency anemia and mild renal insufficiency (creatinine=1,8 mg/dl) on preoperative medication with diltiazem (180 mg), candesartan - cilexetil/hydrochlorothiazide (16+12,5 mg), buflomedilhydrochloride (300 mg), clopidogrel (75 mg), aspirin (100 mg), piracetam (800 mg) and folic acid (100+0,35 mg). The surgery was postponed due to preoperative guidelines of anticoagulant drugs (clopidogrel). The day prior the operation a new ECG was significantly different from the ECG entry (ST depression and negative T waves at the rear wall). The cardiac enzymes and the troponin test were also positive (SGOT=101 U/L, SGPT=73 U/L, CK-NAC=331U/L, LDH=467 U/L, Troponin=0.13) which confirmed the diagnosis of possible acute coronary syndrome.

A delay of the operation has been suggested from the cardiologists. After consideration of the dangers of further delay of the surgery, we decided to proceed besides high intraoperative mortality.
Results: The hemodynamic monitoring included invasive BP, ECG, continuous monitoring of CO (by Flotrack-vigileo), pulse oximetry, and urinary output. The intraoperative anaesthesia was performed by administration of Ropivacaine 0,75% 1,2 ml subarachnoidaly at L3-L4 level. The patient remained heamodynamicaly stable (CO=3,3-4,2 lt/min) during the operation which lasted 50 min. Postoperatively the patient remained for 60 min in PACU under cardiovascular monitoring and we administered through the epidural catheter analgesic drugs (morphine=3 mg) for two days.
Conclusions: Slow titration of spinal-epidural anaesthesia proved to be safe for a patient with ACS.

References

1 Foss NB, *et al.* Effect of postoperative epidural analgesia on rehabilitation and pain after hip fracture surgery. *Anesthesiology* 2005; **102**: 1197–1204
2 Jeya Palan et al. Is clopidogrel stopped prior to hip fracture surgery—A survey of current practice in the United Kingdom. *Injury* 2007; **38**: 1279–1285

Paper No: 120.00

Anaesthesia management of a patient with steele-richardson- olszewski syndrome

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Introduction: Progressive Supranuclear Palsy (PSP), also known as Steele-Richardson-Olszewski syndrome, is a neurodegenerative disease that affects cognition, eye movements, and posture. Characteristics include supranuclear, primarily vertical, gaze dysfunction accompanied by extrapyramidal symptoms and cognitive dysfunction. Currently, no therapy has proved effective. We describe the anaesthetic management of a patient with PSP undergoing an elective cholecystectomy.
Methods: A 67-year old female patient, ASA III, 58 kg and 161 cm height came to our hospital for an elective open cholecystectomy due to chronic cholecystitis. The patient had a history of arterial hypertension, DM type II, osteoporosis, hypercholesterolemia and PSP diagnosed 5 years ago, under treatment with quinapril hydrochloride+ hydrochlorothiazide, repaglinide, alphakalcidole, rosuvastatin, levodopa-carbidopa, entacapone, fluoxetine. The patient had ankylosis of the atlanto-occipital joint, hypertonia of respiratory muscles, rales on both lungs on auscultation, disorder of speech, expression, feelings, balance and walking, dysphagia, difficulty in swallowing, hypertonia of upper limbs and signs of Parkinsonism. Laboratory tests revealed iron deficiency anemia and hypoproteinemia. We ensured a bed in ICU in case needed. Preoperatively it was administered 40 mg omeprazole and bronchodilators. One hour prior anaesthetic induction we administered Levodopa-Carbidopa per os (to avoid intraoperative hypotension and muscle rigidity) and infused 400 ml RL solution, 50 mg ranitidine and 5 mg ondasetron. Intraoperative monitoring included ECG, SpO2 and invasive BP. Anaesthesia was induced with etomidate 18 mg, fentanyl 100 mcg and rocuronium 30 mg. Face mask ventilation and tracheal intubation were difficult (2nd try). Ventilation achieved by use of IPPV, tidal volume 450=ml, respiratory rate 14=br/min, FiO2=0.5 and Ppeak~27 mmHg. Maintenance of anaesthesia was achieved with Desflurane 6% and O2/Air (1/2). We administered 0,6 mg phenylephrine for hypotension and 200 mcg fentanyl plus 600 mg Paracetamol for analgesia. Total volume of fluids was 1100 ml RL.
Results: The operation lasted 114 min uneventfully. The wound was infiltrated with Ropivacaine 0, 5 % 17 ml. The patient emerged 14 min later with sugadammex 240 mg (TOF 2/4), VT 320=ml, RR=15 br/min, inspiratory effort=-17 mmhg, SpO2=99% and FiO2=0,5. Patient was extubated, although level of consciousness could not be assessed, and transferred to the PACU under continuous monitoring of ECG, SpO2 and BP. The level of communication increased 15 min later with help from patient's environment.
Conclusions: Thorough preoperative evaluation and careful perioperative management resulted in an uncomplicated procedure.

Paper No: 132.00

Anesthesia management for total cystectomy in an elderly patient, with an intraoperative blood loss of 56,600 ml

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Introduction: Massive bleeding is a major cause of intraoperative death, and it is a situation that anesthesiologists should always be prepared for. We herein report on a case of total cystectomy surgery on an elderly patient resulting in a blood loss of 56,600 ml, in which the management of anesthesia was completed safely without causing any postoperative neurologic symptoms.
Case: An 81-year-old woman patient, 136 cm in height and weighing 41kg, received total cystectomy and an ileac conduit.
Anesthetic management: Induction of anesthesia was using propofol and fentanyl and maintained with sevoflurane and fentanyl. Sudden severe bleeding occurred two hours from

the beginning of surgery and the amount of bleeding from extirpation of the bladder and uterus was 12,700ml. An average bleeding volume of 400 ml per 5 minutes, and a systolic blood pressure of 60 to 80 mmHg, Cardiac Index (CI) 1. 8 to 2.9 ml/min/kg was maintained through the combined use of high-speed blood transfusion at 100 ml/minute and catecholamine. The intraoperative Hb value was 3.6 g/dl, the Plt value was 1 thousand/il, and APTT and PT could not be measured, thus leading to DIC. The bleeding was restored to a normal state 10 hours following the start of surgery. At the end of surgery, the Plt was 130.0 thousand/il, APTT was 31. 4 seconds, and PT was 15.5 seconds, with the total bleeding amounting to 56,600ml. 126 units of packed RBC, 105 units of FFP, 80 units of platelet, 13,250ml of albumin preparation, 27,750ml of crystalloid solution, and 4,000ml of colloid solution were used. No postoperative complications were observed.

Discussion: A case of a surgery with severe bleeding that took an extended period of time was safely anesthetic-managed by means of the anesthesiologist providing updates on the second-by-second changes in the physical status of the patient to the surgeons, nurse, and the person performing blood transfusion, and by all involved closely communicating with each other. SVV and CI of FloTrac® were useful as indexes for the circulation management of severe bleeding. The total cost was 2,435,064 yen for the transfusion materials alone, but the medical expenses incurred by the patient are covered by the National Health Insurance System in Japan.

Paper No: 139.00

Airway assessment with modified Mallampati test: Sitting position versus Supine position

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Introduction: Airway evaluation is of paramount importance for safe perioperative care.(1) Modified Mallampati test is a standard method of assessing the airway for predicting potentially difficult laryngoscopy and intubation.(2,3,4) The test requires patient to be in sitting position for airway evaluation. Although applicable to the majority of patients, airway evaluation in sitting position may not always be convenient or advisable.Elderly patients, patients with prolapsed disc and fracture spine and very sick patients may not be able to sit up for assessment.(5)

Objectives: To compare modified Mallampati grades observed in sitting and supine position and their correlation to Cormack and Lehane laryngoscopy grade.

Methods: This prospective study was conducted in 215, ASA I and II patients undergoing various routine surgical procedures in BPKIHS, Dharan, Nepal over a period of 3 months. The airway assessment was done using modified Mallampati grade in sitting and supine positions. Mallampati grade of III or IV were defined as the predictors of difficult airway. The laryngoscopy grade was assessed using the Cormack and Lehane grading scale. Grade III or IV of Cormack and Lehane grades was defined as the difficult laryngoscopy and assumed as predictors of difficult intubation. Statistical measures including sensitivity, specificity, positive and negative predictive values and accuracy were used for comparing the two positions for predicting difficult or ease of intubation.

Results: Out of 215 patients, majority 146(68%) were females. Sixty-seven (31%) patients in sitting and 94(44%) patients in supine position had III or IV Mallampati grade ($p=<0.001$). A total of 13(6%) patients had difficult laryngoscopy. Sensitivity of modified Mallampati test was 77% in both the positions. Predictive value of Mallampati grading for difficult intubation were 13% and 10% and for easy intubation were 96% and 97% respectively in sitting and supine position. Specificity and accuracy of modified Mallampati test were both 67% in sitting position, where as 54% and 55% respectively in supine position.

Conclusion: Modified Mallampati grade significantly worsens in supine position compared to sitting. However, airway evaluation in both the positions almost equally predicts for difficult intubation.

References

1 Sood J. Laryngeal mask airway and its variants. *Indian J Anaesth* 2005; **49**: 275–80

2 Mallampti SR. Clinical sign to predict difficult tracheal intubation (hypothesis). *Can Anaesth Soc J* 1983; **30**: 316–7

3 Mallampti SR, Gatt SP, Gugino LD, Desai SP, Waraksa B, Freiberger D, Liu PL. A clinical sign to predict difficult tracheal intubation: a prospective study. *Can Anaesth Soc J* 1985; **32**: 429–34

4 Samsoon GL, Young JR. Difficult tracheal intubation: a retrospective study. *Anaesthesia* 1987; **42**: 487–90

5 Bair AE, Caravelli R, Tyler K, Laurin EG. Feasibility of the Preoperative Mallampati Airway Assessment in Emergency Department patients. *The Journal of Emergency Medicine* 2010; **38**: 677–80

Paper No: 153.00

Disposable laryngeal tube s – a randomized comparison of two insertion techniques performed by novice users

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Objective: The disposable laryngeal tube S (LTS-D) is a supraglottic single-lumen ventilatory device being blindly inserted into the esophagus. Using a standard insertion technique recommended by the manufacturer frequently resulted in prolonged and repeated insertion attempts and even failure to insert the tube at all. We tested the hypothesis that, with a modified insertion technique the number of placement attempts lasting more than 45sec could be significantly reduced.
Methods: After IRB approval and written, informed consent, 54 adult patients undergoing trauma surgery under propofol-fentanyl-based general anesthesia had an LTS-D inserted by first-time users, randomly using either a standard or modified technique. The modified technique used the Guedel tube approach", by rotating the tip of the LTS-D by 180° prior to insertion. Simultaneous chin lift to create sufficient retropharyngeal space was performed with the thumb of the other hand. When the tip of the LTS-D touched the hard palate the tube was again rotated by 180° and pushed down into the esophagus until elastic resistance was felt. Ventilation was initiated and rated sufficient with an initial end-tidal CO2 >20mmHg. The time required for successful placement (cessation of mask ventilation until the first sufficient tidal hub was delivered via the LTS-D) was the main outcome variable.
Results: All users were novices regarding clinical use of the LTS-D regardless of the technique applied. A brief mannequin-based demonstration of the device and the particular technique to be used was given prior to insertion. Both patient groups showed no significant differences in terms of age, weight, height, and body mass index. The time required for successful insertion was 73 ± 41sec with the standard technique compared to 40 ± 8sec when the modified technique was used (P=0.0003). Insertion attempts lasting longer than 45sec were observed in n=20/27 patients (74%) and in n=6/26 patients (23%) in the standard and modified technique groups, respectively (P=0.0003). In one patient of the modified technique group, placement was entirely impossible.
Conclusion: Our modified technique significantly reduced the time required for successful insertion of an LTS-D when performed by first-time users. Also, insertion within a 45sec time frame was significantly more frequent with the modified technique, i.e. allowing placement of the LTS-D within two cycles of cardiopulmonary resuscitation. Since all users were novices, we could not determine a learning curve. Although likely, however, it remains speculative at this stage if the time required for insertion could be further reduced with increasing clinical experience and training.

Paper No: 162.00

Incidence and risk factors of undetected postoperative hypoxaemia at a Teaching Hospital in Africa, Rwanda: The usefulness of Portable oximeter

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Introduction: All surgical patients, especially those who have undergone abdominal surgery are at risk of postoperative hypoxaemia. However, there have been few studies on the incidence, morbidity and treatment of postoperative hypoxaemia in sub-Saharan African hospitals, possibly because most hospitals do not necessarily have the resources to routinely monitor oxygen saturation and administer oxygen to all surgical patients postoperatively. In this study, an incidence of postoperative hypoxaemia was reported in patients undergone abdominal surgery and risk factors affecting postoperative oxygen saturation were investigated at Kigali University Teaching Hospital, Rwanda.
Methods: This prospective observational study was conducted in 125 patients who underwent abdominal surgery in over a period of 5 months from October 1st, 2010 to March 1st, 2011. Oxygen saturation (SpO2) was measured by a portable pulse oximeter in all patients breathing ambient air or supplemental oxygen immediately on arrival to the postanaesthesia care unit (PACU). Additional SpO2 was measured at 3 hours and 6 hours after surgery and it was measured in the morning and in the afternoon of the 1st and 2nd postoperative days. Hypoxaemia was defined Sp02 ? 90%. Risk factors were identified from age, body weight, ASA physical status, smoking history, duration of anaesthesia, anaesthetic agents used, types of surgery and surgical incision, use of analgesics for postoperative pain control.
Results: This study revealed that the incidence of hypoxaemia on admission to the PACU was 24 % for all the patients and 27 % of the patients transferred from the operating theatre without supplemental oxygen. The incidence varied depending on time during the postoperative period. At 3 hours after surgery, it dropped to 9.6%, thereafter it started rising and reached at 17.6% on the 2nd postoperative day. A half of patients became hypoxaemic at least one time during the study period. Seven percentages of patients were hypoxaemic at more than five measurement times. A multivariate analysis showed ASA PS III and IV, and

age>65 as an independent risk factor of postoperative hypoxaemia.
Discussion and Conclusion: Our study showed that hypoxaemic events are common following abdominal surgery. ASA PS III & IV and age> 65 are the independent risk factors. This study strongly suggests that patients undergoing abdominal surgery should be continuously monitored with pulse oximeter and oxygen delivery devices should be available to all postoperative patients at any African hospitals and to Hospital authorities an high dependency unit must be develop and well equipped with skilled medico-nursing staff.

References

1 Rosenberg et al.: Incidence of arterial hypoxemia after laparatomy. *Surg Forum* 1992; **43**: 35–37
2 Nimmo AF, Drummond GB. Respiratory mechanics after abdominal surgery measured with continuous analysis of pressure, flow and volume signals. *Br J Anaesth* 1996; **77**: 317–26

Paper No: 206.00

CO_2 EMBOLIA IN A LAPAROSCOPIC HEPATECTOMY: Case report

Guillermo Andres Tajtelbaum and **Alejandro Javier Bernasconi**

Introduction: Laparoscopic surgery is a modern technique performed wordlwide thanks to its multiple benefits compared to the traditional approach(open surgery). However, there are certain complications, and among them some can be mortal. Although fairly rare, gas embolism from CO_2 is a well known complication of laparoscopic procedures. CO_2 embolism can cause the death of the patient as it progresses undetected. A correct and prompt diagnosis should be done as to quickly apply the adecuate terapeuthic procedures. We hereby present a case of CO_2 embolia in a laparoscopic liver resection.
Case Report: Male individual Aged 51, ASA II undergoing a laparoscopic left lobe hepatectomy due to a suspicious nodule. During the laparoscopic procedure which was being carried out normally, an episode of CO_2 embolia occurred. Arterial blood pressure, end tidal concentration of CO_2, oxygen saturation and arterial gases were considered to be within the normal range for this kind of procedure. The surgery was performed in the head up position. During dissection, the surgeon opened suprahepatic veins. Then we saw the image on the left.
Discussion: We interpreted this phenomenon (abrupt decrease in the ET CO_2, arterial blood presure and SpO_2, as seen on the tendences) as a gas embolism. The surgeon was inmediately informed and pneumoperitoneum was interrupted. At the same time, we aspirated the central venous catheter trying to get rid of the gas bubbles. Even though described, no gas was obtained through the catheter. We therefore started treatment: the patient was placed in Trendelemburg position, oxygen was supplied at 100% concentration and lungs were manually ventilated for a moment, fluids were administered enerically as well as phenilephrine. After stabilization, which took us 5 minutes, surgery continued in the open way. The patien did not present any further complications and had a normal 5 day post operative period after which he was discharged from hospital.
Conclusion: Gas embolism from CO_2 can have multiple systemic results. An accurate and complete monitorization is mandatory when performing laparoscopic liver surgery, as to diagnose this kind of complications. This enables the patient to improve his/her possibilities of a fast and easy recovery. Despite not having transesophageal echocardiography, all the former physiological parameters considered allowed us to identify the embolia and to treat it accurately.

Paper No: 208.00

Anesthesia for enteroscopy procedure in a world gastroenterology organizing training center in Thailand

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Background and Objective: Enteroscopy procedure is another diagnosis and treatment option for gastrointestinal tract abnormalities especially for small bowel pathologies. The objective of the study is to study and review anesthetic data from a World Gastroenterology Organizing Training Center in Thailand as a basis for further research.
Methods: Retrospectively analyzed the patients on whom enteroscopy procedure had been performed during the period of March, 2005 to April, 2011 in Siriraj GI Endoscopy Center. The patients' characteristics, preanesthetic problems, anesthetic techniques, anesthetic agents, anesthetic time, type of procedure and complications were assessed.
Results: There were 145 patients who received the procedure during study period. The age group of 50-69 years was the highest one (46.9%). Most patients had ASA class II (57.2%). The indications of procedure were gastrointestinal bleeding (58.6%), chronic diarrhea (15.2%), protein losing enteropathy (2.1%) and others (24. 1%). Hematologic disease, cardiovascular disease and hypertension were the most common pre-anesthetic problems. General anesthesia and intravenous sedation was the anesthetic technique mainly employed. Anesthetic agents were mainly administered with propofol, midazolam and fentanyl. The mean anesthetic time was 92.8 ± 48.4 minutes. The indications for enteroscopy procedure were gastrointestinal bleeding (58.6%), chronic diarrhea (13.8%), protein losing enteropathy (2.1%) and others (15.5%). Single balloon and oral intubation

was the most common type and route of enteroscopy. The most frequent anesthetic complication was hypotension.
Conclusion: During anesthetic management for enteroscopy procedure, special techniques or drugs in anesthesia are not routinely required, however, the anesthetic personnel had to optimize the patient's condition for safety and there should be an awareness of complications.

Paper No: 209.00

A comparison between experienced anesthetic nurse and anesthetic trainee administered deep sedation for colonoscopy

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Introduction and Objective: A high number of complication rates during deep sedation are higher than during mild or moderate sedation. There were limited data about anesthetic trainee deeply sedated colonoscopic patients. The objective of the study is to review our sedation practice and to compare the clinical effectiveness of an experienced anesthetic nurse and anesthetic trainee administered deep sedation for colonoscopic procedure in adult patients.
Methods: We undertook a retrospective review of the sedation service records of adult patients who underwent colonoscopy. All endoscopies were performed by staff endoscopists and fellows in gastroenterology. All analgesia and sedation was administered by anesthetic nurse or anesthetic trainee. The primary outcome variable is the complication rate. The secondary outcome variables are the total number of staff consultation, ease of intubation, and patient and endoscopist satisfaction.
Results: A total of 438 endoscopies were performed during the study period. Of these, 220 patients were sedated by experienced anesthetic nurse (group N) and 218 patients were sedated by anesthetic trainee including resident and nurse student in anesthesiology (group T). All sedations were supervised by the staff anesthesiologist. Analgesic and sedative agents in both groups were propofol, midazolam and fentanyl and were comparable dose among the two groups. There were no significant differences in patients' characteristic, mean sedation time, indication and type of intervention between the two groups. The complication rate in both groups was comparable. There were also no significant differences in staff consultation, ease of intubation, and patient and endoscopist satisfaction between the two groups. Serious complications were none.
Conclusion: Experienced anesthetic nurse and anesthetic trainee administered analgesia and sedation supervised by the staff anesthesiologist for colonoscopic procedure is safe and effective. The success rate, staff consultation, ease of intubation, patient and endoscopist satisfaction, and complications are comparable.

Paper No: 227.00

Sore throat complaints after elective surgery: cumulative incidence and risk factors

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Introduction: Symptoms of postoperative throat discomfort such as sore throat, hoarseness and dysphagia are common during anesthetic practice. Although sore throat complaints (STCs)are regarded by many authors as minor complications, they affect the patient's recovery and have been associated with patient's dissatisfaction (1; 2).
The incidence of STCs has been reported to be higher with endotracheal tube (ETT)than with laryngeal mask (LM) use (1). Data on the incidence of laryngo-pharyngeal morbidity vary widely in the literature and its analysis must consider the survey method used (3; 4).
Several studies explored risk factors for postoperative STCs and report type of airway device used, female gender, younger age, size and shape of endotracheal tube, use of lubricants, cuff pressure, relaxation with succinylcholine, long duration of intubation, smoking history or lung disease, presence of blood on the tube after anesthesia, presence of natural teeth and some types of surgical procedures as possible risk factors (1; 3; 5; 6).
Objectives: To determine cumulative incidence of STCs which occur with the insertion of LM and ETT during the first hour and 24 hours after elective surgery. In addition, to establish risk factors associated with its occurrence.
Methods: In a cohort study, a total of 451 patients scheduled for elective non-cardiac surgery were included consecutively for 6 months (ASA I-II-III, $>$18 years old) who underwent LM or ETT airway management for general anesthesia. Through a questionnaire with indirect questions the presence of sore throat, hoarseness, dysphagia and the composite endpoint STCs were assessed one and 24 hours after surgery. Marginal models were used to identify risk factors.

Results: We found an incidence of STCs of 26.8% and 13.5% at first and 24 postoperative hours respectively. At first hour, they were classified as sore throat (23.9%), hoarseness (6.7%) and dysphagia (6.4%). Each compound was not mutually exclusive. At 24 hours of follow up, incidence of STCs and its compounds decreases significantly but differently to ETT and LM. STCs were associated with female gender (OR=1. 53 95%CI 1. 00-2.37, p=0.05), ETT intubation (OR=4. 20 95%CI 2.19-8.04, p<0.01) and bloodstain on airway device at extubation (OR=2.00 95%CI 1. 18-3.36, p<0.01).
Conclusions: The incidence of STCs remains significant. There are differences in the pattern of reduction between ETT and LM over time and this study confirms risk factors for postoperative STCs like use of ETT, presence of blood during the airway device extraction and female gender.

References

1 Higgins PP, Chung F, Mezei G. Postoperative sore throat after ambulatory surgery. *British journal of anaesthesia*. 2002 Apr;**88**(4): 582–4

2 Macario A, Weinger M, Carney S, Kim A. Which clinical anesthesia outcomes are important to avoid? The perspective of patients. *Anesthesia and analgesia*. 1999 Sep;**89**(3): 652–8

3 Rieger A, Brunne B, Hass I, Brummer G, Spies C, Striebel H, *et al.* Laryngo-pharyngeal complaints following laryngeal mask airway and endotracheal intubation. *Journal of Clinical Anesthesia*. 1997 Feb;**9**(1): 42–47

Paper No: 249.00

The validity of simulation for team training for patient safety in anaesthesia: an observational study comparing team interactions in the operating room and the simulated environment

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Introduction: Safe patient care requires a team-based approach (1) and simulation-based training has been embraced as an appropriate method to develop these teamwork skills (2). However, questions remain about the validity of simulation for training of clinical teams. While there is some support for the validity of anesthesia simulations based on observed activity patterns (3), most evidence relies on participant self-report. Simulations of operating room (OR)events aim to create an authentic experience for participants, where interactions between team members reflect normal patterns of behaviour. There is limited evidence to show that anesthetists' behavior in the simulator reflects their workplace behaviour, or that behaviours under routine conditions predict crisis behaviours.
Objectives: We compared individual anesthetist's patterns of team interactions across three settings: the OR; a routine simulation; and a crisis simulation. Methods We videotaped anesthetic teams in: 1) an OR; 2) a routine simulation modelled on cases and events in that OR; and 3) a simulated case with an intra-operative crisis. Post-simulation questionnaires sought ratings for realism of the different teamwork components, and their relative frequency in the simulator compared to the OR. For each anaesthetist in each setting, two pre-defined video segments were entered into Observer XT video-analysis software. Based on theoretical constructs of Crew Resource Management (4,5), we used a constant comparison technique (6) to develop a framework for coding team interactions, which was then completed by two researchers. Different types of interactions were measured as the proportion of all coded interactions by that anesthetist in each setting, and compared across the three settings, using paired t-test.
Results: Twenty anaesthetists were videoed in the two simulations, and 17 across all three settings, generating 114 video segments and 2501 coded interactions. Participants rated the different teamwork components as realistic / very realistic and occurring at similar frequencies in the simulations and OR. For the majority of coded interaction types we found no significant difference between their proportions for each anesthetist across the three contexts (p >0.05). A subset of interactions types occurred in significantly different proportions in the three contexts. In particular, situational assessments and requests for information occurred more frequently in the crisis simulations than in both the routine simulation and the OR.
Conclusions: Our results suggest that functioning in a simulated environment does not significantly affect anesthetists' way of interacting with their team, supporting the validity of simulation for training and research in healthcare team interactions to improve patient safety.

References

1 Manser T. Teamwork and patient safety in dynamic domains of healthcare: a review of the literature. *Acta Anaesthesiology Scandinavica*. 2009; **53**: 143–51

2 Salas E, DiazGranados D, Weaver S, King H. Does team training work? Principles for health care. *Academic Emergency Medicine*. 2008; **11**: 1002–9

3 Manser T, Dieckmann P, Wehner T, Rallf M. Comparison of anaesthetists' activity patterns in the operating room and during simulation. *Ergonomics*. 2007; **50**(2): 246–60

4 Gaba D, Fish K, Howard S. Crisis Management in Anesthesiology. 1st ed.: Churchill Livingston; 1994

5 Helmreich R, editor. Threat and error in aviation and medicine: Similar and different. Special Medical Seminar, Lessons for Health Care: Applied Human Factors Research; 2000. Australian Council of Safety and Quality in Health Care & NSW Ministerial Council for Quality in Health Care

6 Wellington J. Educational Research. Contemporary Issues and Practical Approaches. first ed.: Continuum International Publishing Group; 2000

Paper No: 259.00

Unrecognized osteogenesis imperfecta syndrome: the strategies for general anesthesia maintenance and recovery

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Introduction: Osteogenesis Imperfecta (OI) is a hereditary syndrome that has four types of clinical appearence. Syndrome is characterized by one or more of clinical symptoms; like imperfect osteogenesis leading to fractures, defective dentination and blue sclera (1). Anesthetic management of a patient with OI syndrome includes intubation difficulties, positioning problems due to brittle bones and tendency to develop malignant hyperthermia. Inhalated general anesthetics and succinylcholine are the most important triggering agents for malignant hyperthermia (2).
Objective: To describe the general anesthesia maintenance and recovery of a patient with unrecognized OI syndrome.
Methods: Twenty years old woman, 37 weekly, painful pregnant had emergent cesarean section. She had no gynecological follow up during pregnancy. She had undergone a non-problematic cystoscopy operation previously. She had a bandage on her left foot, explaining that she had injured before. Her laboratory parameters were normal without any chronic disease. The patient was intubated after routine anesthesia monitorization and induction with propofol and succinylcholine. In the first examination of the pediatricians, the new born had a broken right humerus and blue scleras, so that he could be an OI syndrome. Regarding to malignant hyperthermia, the anesthesia machine was changed by another machine immediately, anesthesia was maintained with totally intravenously agents, esophageal temperature was monitorized. After a deep questionnary with the relatives, it was learned that the patients' father, uncle and three cousins had OI syndrome. They thought that, mother was normal according to their family. The patient was extubated in the post operative intensive care unit. She had light blue color in her scleras that can hardly be seen. She had no pain on her neck or throat. There was a fracture on her bandaged left foot that could be seen on the plane roentgenogram. The orthopedists immobilized the fractured bone. Her hemodynamic parameters, CO2 levels on the arterial blood gases, potassium, creatine phosphokinase and lactat dehidrogenase levels were normal for two days. Her body temperature was under 37 ? C except on the 20th (37,5? C) and 33rd (37,8? C) hour. Ice packs were applied to reduce the temperature. The patient and her family was informed about the risks and the complications of OI syndrome.
Results: The patient was discharged from intensive care unit to gynecology clinic after 48 hours and discharged from the hospital at the 4th day without any complication.
Conclusion: Having a brief physical examination and anesthetic visit preoperatively is really important, even in emergent cases.

References

1 Sillence DO, Senn A, Danks DM. Genetic heterogeneity in osteogenesis imperfecta. *Journal of Medical Genetics* 1979; **16**: 101–116
2 Glahn KPE, Ellis FR, Halsall PJ, Müller CR, Snoeck MMJ, Urwyler A, Wappler F. Recognizing and Managing a Malignant Hyperthermia Crisis: Guidelines from the European Malignant Hyperthermia Group. *Br J Anaesth.* 2010; **105**(4): 417–420

Paper No: 283.00

Or efficiency following implementation of the safety checklist

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Introduction: In 2007, the WHO created a Surgical Safety Checklist (SSC) encompassing a simple set of surgical safety standards that can be used in any surgical setting. The SSC was piloted in eight hospitals globally between October 2007 and September 2008 with results demonstrating a decrease in inpatient death rate from 1. 5% before the checklist was introduced to 0.8% afterward (P=0.003). Inpatient complications occurred in 11. 0% of patients at baseline and in 7.0% after introduction of the checklist (P<0.001).[1]
Objectives: The purpose of this study was to introduce the Surgical Safety Checklist (SSC) into an ambulatory surgical facility and to determine if operating room efficiency was affected by its implementation.
Methods: After REB approval, data was collected on all surgical cases in an ambulatory surgical facility for a 3-month period (April –June 2009) before implementation of the SSC and in a 3-month period (April –June 2010) following implementation of the SSC. Efficiency was determined for the first patient of the day by comparing the OR entry time to the scheduled start time. For each subsequent case, the time between the patient exiting the room and the next patient entering the room was determined. Median and interquartile range was determined and data compared between the 2 time periods with a Mann-Whitney U test. The number of canceled cases because of time restraints was noted. Data was also collected in the operating room to determine compliance with each section of the SSC; Briefing, Time Out and Debriefing.
Results: Data on 443 patients before implementation and 478 patients after implementation were collated. Data was

also subdivided to assess efficiency of the surgical specialties. Overall, there was a 4 minute longer turnover time after SSC implementation. Compliance with the SSC was 99.7%. There was no difference in the # of cancelled cases between time periods. Detailed data is found in Table 1.

Discussion: While there are a number of variables that cannot be accounted for in this study, including such things as availability of surgical suite attendants, nurses, physicians, institution of regional blocks and an approximate overall 10% increase in volume of cases, it is evident that despite nearly 100% compliance with the SSC, there has been no clinically important decline in efficiency.

References

1 *N Engl J Med* 2009; **360**: 491–9

Paper No: 287.00

Hemodynamic and anesthetic management of patients undergoing transcatheter aortic valve implementation

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Introduction: The transcatheter aortic valve implementation (TAVI) is a novel, less invasive, treatment technique for patients with symptomatic aortic stenosis with contraindications for open heart surgery. The goal of hemodynamic management during the procedure is to achieve hemodynamic stability with exact blood pressure control and use of rapid ventricular pacing (RVP). We describe the hemodynamic and anesthetic management of general anesthesia for the TAVI procedure, when the hemodynamic was being monitored by continuous cardiac output (cCO) and mixed venous oxygen saturation (SvO2) and depth of anesthesia by EEG-Spectral entropy.

Objectives: The aim of this study was to detect the cardiac failure prevalence during TAVI procedures, defined as a cardiac index (CI) under 2 l/min/m2 and SvO2 under 58% (1). The second objective was to examine how the spectral entropy values would react to the critical events during the procedure, especially to the rapid ventricular pacing.

Methods: The study was approved by the local ethic committee and all patients provided written informed consent. Continuous cardiac output and mixed venous oxymetry Vigilance® monitor was used for the hemodynamic monitoring. Anesthesia depth was monitored by the M- ENTROPY® Module of the S/5 Anesthesia Monitor (2). For the RVP, the pacing ball device was introduced through the right jugular vein and RVP at a frequency of 180/min was used during the insertion of the aortic valve stent. Total intravenous anesthesia (propofol, fentanil, cis-atracurium) was standardized and guided by Spectral entropy.

Results: Twenty patients with mean age of 79 years (range 68-87) and EuroSCORE 18(range 5-46) were included in to the study. The mean aortic valve area before operation was 0.5 cm 2 /m 2 (range 0.2-0.8) and the mean AV peak gradient was 77 mmHg (range 55-129). The CI under 2 l/min/m2 (mean 1. 6; range 1. 3-1. 9) and SvO2 value under 58 % (mean 54; range 46-58) were detected in 60 % of patients (n=12). All of these patients received perioperative inotropic support and 90 % of patients also required norepinephrine infusion for vasoactive support. Spectral entropy values decreased significantly during RVP (44 vs. 25; p= 0.01).

Conclusion: A high incidence of cardiac failure and insufficient oxygen delivery requiring inotrope support was detected, suggesting that invasive hemodynamic monitoring via a pulmonary artery catheter, should be considered during those procedures.The spectral entropy values decreased significantly during the rapid ventricular pacing without any changes in the anesthesia management.

References

1 Holm J, Håkanson RE, Vanky F, Svedjeholm R. Mixed venous oxygen saturation is a prognostic marker after surgery for aortic stenosis. *Acta Anaesthesiologica Scandinavica* 2010; **54**: 589–595

2 Musialowicz T, Lahtinen P, Pitkänen O, Kurola J, Parviainen I. Comparison of Spectral Entropy and BIS VISTA™ monitor during general anesthesia for cardiac surgery. *J Clin Monit Comput*. 2011; **25**: 95–103

Paper No: 289.00

An instrument to identify quality improvement goals and enhance patient care: the healthcare matrix

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Introduction: The traditional model of morbidity and mortality conference often focuses on unexpected adverse outcomes and seldom identifies systems-based issues and interventions for improving patient care. In 1999, the Accreditation Council for Graduate Medical Education adopted six core competencies, subsequently adopted by the American Board of Medical Subspecialties and The Joint Commission, that physicians-in- training must master to provide quality care. In 2001, the Institute of Medicine recommended six aims for improving the nation's health care system: safety, timeliness, effectiveness, efficiency, equity, and patient-centeredness. The Healthcare Matrix1 is a blueprint that links the six core competencies with the six aims for improvement. The purpose of this study was to introduce

the Healthcare Matrix into a large University Hospital setting and to compare anesthesia provider preference for this matrix with that for the traditional model for morbidity and mortality conference.

Methods: We presented an introductory lecture describing the Healthcare Matrix to 60 anesthesia providers in our department, both physicians and CRNAs, followed by a case presentation utilizing the matrix. The anesthesia providers were then asked to complete a ten-question survey. Survey responses were summarized with descriptive statistics. We compared respondents' preferences for the two approaches using Fisher's Exact test.

Results: Participants' survey response rate was 52% (31/60). The majority of respondents (94%) believed that the Healthcare Matrix is an effective method for identifying the individual components of a multi-factorial problem. Twenty five (83%) of 30 respondents believed that the Healthcare Matrix generates goals for quality improvement. The Healthcare Matrix was significantly favored over the traditional approach ($p=0.024$).

Discussion: The majority of respondents in the study believed that the Healthcare Matrix would generate goals for quality improvement. In addition, the Healthcare matrix identifies problems in care-delivery systems that shift the focus away from the individual and addresses the multiple factors that may have contributed to an event.

References

1 Bingham JW, Quinn DC, *et al.* Using a Healthcare Matrix to Assess Patient Care in Terms of Aims for Improvement and Core Competencies. *Joint Commission Journal on Quality and Patient Safety*. **3**: 98–106. February 2005

Paper No: 350.00

Training office personnel in the implementation of a comprehensive safety checklist for office-based anesthesia and surgery

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Introduction: In recent years, the economic pressures of medicine have incited a paradigm shift in health care delivery, such that surgical procedures are moving from the hospital to the office-based setting. [1] Recent studies found that a comprehensive checklist used in an interdisciplinary, team-based setting resulted in a reduction in surgical complications as well as cost savings. [2,3,4] Training office personnel is perhaps the most significant barrier to introducing such a checklist.

Objectives:

Deploy a comprehensive safety checklist in the outpatient setting

Train office personnel how to both use the checklist and customize it to the individual practice

Analyze the accuracy of office personnel in using the checklist

Determine the checklistâ€™s effect on the frequency and severity of adverse events

Methods: With focus-group input from office personnel, the checklist was customized to the individual practice and has already been implemented in an outpatient plastic surgery office. Data are being collected on how accurately the checklist is filled out as well as its effect on adverse events.

Results: Preliminary results from a retrospective chart review using the safety checklist demonstrate a clear need for a systematic way to ensure that necessary patient safety steps are taken pre-, peri-, and post-operatively. Data on personnel accuracy and adverse events from the prospective phase are forthcoming and will be available before the World Congress.

Conclusions: A comprehensive safety checklist can be implemented and customized to the individual practice with the assistance of office personnel. However, office personnel accuracy remains less clear, as does the checklistâ€™s impact on adverse events. Completion of the current, ongoing prospective phase of the study will allow one to quantify both these parameters.

References

1 Gandhi TK, Lee TH. Patient safety beyond the hospital. *N Engl J Med*. 2010; **363**(11): 1001–1003

2 de Vries EN, Prins HA, Crolla RM, et al. Effect of a comprehensive surgical safety system on patient outcomes. *N Engl J Med*. 2010; **363**(20): 1928–1937

3 Semel ME, Resch S, Haynes AB, *et al.* Adopting a surgical safety checklist could save money and improve the quality of care in U.S. hospitals. *Health Aff (Millwood)*. 2010; **29**(9): 1593–9

4 Neily J, Mills PD, Young-Xu Y, *et al.* Association between implementation of a medical team training program and surgical mortality. *JAMA*. 2010; **304**(15): 1693–1700

Paper No: 355.00

Lyophilised concentrates of coagulation factors in place of fresh frozen plasma- the philosophy of an isolated small regional hospital

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Introduction: The Ospidal da Engiadina Bassa (OEB) in Scuol is a small regional hospital in the easternmost area of

Switzerland, providing primary health care in the fields of surgery, orthopedics, traumatology, internal medicine, anaesthesia, pain and emergency medicine, complementary medicine, intermediate care, gynaecology and obstetrics.

Objectives: The OEB is isolated from the tertiary trauma center in Chur by the Alps with high mountain passes and winding roads, which can be treacherous in winter due to foul weather.

Patient transport by helicopter (normally 20 minutes) is often unfeasible during the winter and at night time. Transportation time by road takes two hours.

The Engiadina Valley is a popular vacation destination for visitors enjoying active sports such as skiing, paragliding, (moto-) biking and climbing etc. We therefore see severely traumatized patients on a regular basis.

Our philosophy is to immediately stabilize polytrauma patients or those with massive bleeding due to internal disease before transport to the trauma center (in accordance with "damage control surgery" and "early coagulation resuscitation").

The goal is to save time by insuring the rapid availability of blood products, efficient stabilisation of coagulation, swift initiation of pain and shock therapy, effective temperature control and normalization of electrolytes and pH.

Methods: In 2008, we decided to abolish FFP and thrombocyte concentrates at our hospital, because of the costs of emergency delivery, storage and the delays caused by the thawing procedures for FFP.

We introduced dedicated coagulation factors and rFVIIa instead of thrombocyte concentrates.

We normalize coagulation by following an algorithm derived by the anaesthetic senior house officer:

1. EC (0 negative, BG compatible)
2. Tranexam-acid 15 mg / Kg KG
3. F XIII 15 mg / Kg KG
4. Fibrinogen Bolus 2 gr
5. Lyophilised concentrates of coagulation factors (PPSB) 20 IE / Kg KG

Expected hypothrombocythaemia:

6. Desmovasin 30 yg / Kg KG
7. rF VII a 90 yg / Kg KG

Results: We use rapidly available, efficient and predictable therapeutic agents which have a low incidence of side effects.

We were able to significantly reduce the time needed for preparation and application of the coagulation agents and could thus stabilize the polytraumatic or massive bleeding patient more rapidly ("early hemostatic resuscitation").

We reduced the time required to get these patients ready for transportation to the central hospital ("golden hour of shock").

We were able to minimize the number of erythrocyte concentrates needed for adequate substitution.

As an additional benefit, emergency patients on anticoagulation therapy could be readied for surgery more rapidly.

Conclusions: In small hospitals isolated from the tertiary trauma centers, with a potentially long and formidable transport, it is economically and medically sound to have an adequate supply of coagulation factors on hand.

The use of coagulation factors makes it possible to stabilize the coagulation of a massively bleeding patient and support his life before transportation to a tertiary care center for definite surgical therapy.

We believe that adherence to this algorithm it is an efficient to give polytrauma patients and patients with massive bleeding disorders a reasonable chance to survive transportation and their definitive life saving surgery.

In fact we treated one polytrauma (motocyclist) with this algorithm. In the tertiary trauma center she got the definitely surgical and medical care. In result she survived without neurological or hypoxic residuals, but loosing a leg because of the accidential mechanism.

Paper No: 356.00

Leadership support is critical to improve compliance with recommended departmental practice guidelines

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Introduction: Outcome measures are valuable in monitoring clinical practice recommendations (metrics) used to focus on patient satisfaction and optimize wellness.(1,2) Yet physician compliance with guidelines is difficult to implement.(3,4)

Objectives: We have been providing compliance rates for clinical practice recommendations (metrics) quarterly (every 3 months) to physicians for the past 4 years. In December a new Chair was appointed and over the next few months he provided leadership support by placing emphasis on compliance with departmental metrics, as part of annual performance evaluations. We chose the overall reports in the quarter after the annual performance evaluations were completed; and compared this to a similar time period (quarter) for the prior year.

Methods: We compared the metrics compliance rates from the same anesthesiologist's quarterly results.

The Metrics:

PONV-Compliance is defined as multimodal prophylactic treatment with anti-emetic agents for patients with multiple PONV risk factors.

Temperature and On-time Antibiotics Compliance were defined as per the SCIP/NSQIP protocols (2).

Results: The Table shows the overall data for all three metrics for each quarter. All showed highly significant improvement ($p<0.001$) in compliance with established departmental recommendations.

Conclusions: We have previously shown that an educational program and training with consistent report backs in a non threatening manner is important in the development in a

quality improvement program for a large group of 46 anesthesiologists in our complex tertiary cancer center (3). However, leadership support is essential in developing consistently improved performance based on departmental metrics. The improvements were noted in recent hires as well as experienced practitioners. You can teach an old dog new tricks!

References

1 John E, Tetzlaff MD, Professionalism in Anesthesiology, *Anesthesiology* 2009; **110**: 700–2

2 Professionalism in Anesthesiology Treatment Guidelines from the Medical Letter, Volume 4 (Issue 52) December 2006

3 Frenzel JC, Kee SS, Ensor JE, Riedel BJ, Ruiz JR. Ongoing provision of individual clinician performance data improves practice behavior. *Anesth Analg*;**111**: 515–9

4 White PF, O'Hara JF, Roberson CR, Wender RH, Candiotti KA. The impact of current antiemetic practices on patient outcomes: a prospective study on high-risk patients. *Anesth Analg* 2008; **107**: 452–8

Paper No: 371.00

Thoracic Paravertebral block in a patient with Amyotrophic Lateral Sclerosis

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Introduction-Objectives: Motor neuron disease (MND) is a serious and incurable form of progressive neurodegeneration. Amyotrophic lateral sclerosis (ALS) is the most common form affecting both the upper and lower motor neurons and accounts for approximately 60%-70% of all cases. There are two major concerns in the anesthetic management of patients with such a disease, prolongation of the effect of non-depolarizing muscle relaxants, and controversy about the use of a neuroaxial block. Until now the anesthetic management in such patients included general anesthesia and central regional blocks (especially epidural anesthesia). The use of peripheral nerve blocks has limited experience. Our team decides (after written consent of her husbant) to manage the patient by thoracic paravertebral block plus sedation and IV analgesics drugs insted of general anesthesia due to respiratory complications.
Method-Results: A 42-year-old woman, 37 Kg, suffering from ALS (diagnosed 5 years ago), with generalized muscle weakness, rigidity and atrophy, complications in swallowing and chewing, assist ventilation via a tracheostomy due to respiratory insufficiency, was scheduled for a gastrostomy. The patient was under treatment with riluzole, baclofen, miorel, citalopram, budezonide and ipratropium bromide monohydrate+salbutamol. The patient was administered omeprazole 40 mg plus ondasetron 4 mg and oxygen (FiO2=0,4) via the tracheostomy tube. With the patient in the lateral decubitus position, a paravertebral puncture was performed at Th6 – Th11 left paravertebral space using a 22 G short bevel needle with the method of fixed distance (1,5 cm advancement transverses process). We used Ropivacaine 0,75% 4ml for each segment, with a total amount of 25 ml. Intraoperatively we used slight sedation with Midazolam 2 mg, plus N2O/O2 (60/40). For visceral pain treatment we administered Paracetamol 600 mg, Parecoxib 40 mg, Tramadol 40 mg and Ketamine 10 mg IV. Saturation was 98-99% and the patient remained heamodynamicaly stable. The postoperative course was uneventful without pneumothorax, nerve damage and exacerbation of the neurological signs and symptoms of ALS.
Conclusions: Thoracic paravertebral injections produce multidermatomal ipsilateral somatic and sympathetic nerve block. From this case report we conclude that thoracic blocks can be used successfully in the anesthetic management of upper abdominal procedures in patients suffering from ALS.

Paper No: 389.00

Effect of preferred music on pain intensity after open heart surgery

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Introduction: Pain is a common phenomenon after surgery. Cardiac surgeries are accompanied by postoperative pain, and generally the patients experience acute pain after these surgeries. Inadequate pain management after cardiac surgery predisposes patients to many complications. Therefore, the aim of this study was to determine the effect of preferred music on pain intensity after open heart surgery.
Methods: This study was a randomized clinical trial (RCT) that took place in an open heart intensive care unit (ICU) of a university hospital in Sari, Iran. A total of 60 patients who had undergone open heart surgery, were randomly allocated in two groups; 30 patients received 30 minutes of their preferred music by headphone (Intervention), whereas, 30 patients did not listen to music (control). Subjects' pain intensity was measured before the intervention, immediately after, 30 and 60 minutes after intervention with Numerical Rating Scale (NRS). Data were collected and analyzed by using Chi-square, student t test and repeated measurement statistical test. RESULTS: Average of pain intensity in the intervention group at times before, immediately after, 30 and 60 minutes after the intervention was 5.8, 3.1, 2.5 and 2.4 and in the control group was 4.7, 4.7, 4.8 and 4.9, respectively. Repeated measurement ANOVA statistical test showed that the music had a significant impact on pain intensity and cause a significant reduction in pain intensity (P=0/0001).

Conclusions: Music can be effective as a non-pharmacologic, inexpensive, non-invasive and without any side effects method for pain management after open heart surgery.

Keywords: Music; pain management; open heart surgery; ICU; music therapy

Paper No: 390.00

Evaluation of perioperative complications at CHUK, Rwanda: A baseline survey prior to implementation of the WHO surgical Checklist

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Introduction: Intraoperative and postoperative complications continue to be a public health problem. According to the study conducted by WHO, the risk of complications is poorly characterized in many parts of the world, but studies in industrialized countries have shown a perioperative rate of death from inpatient surgery of 0.4 to 0.8% and a rate of major complications of 3 to 17% (1). These rates are likely to be much higher in developing countries, where incomes are lower. However, many data suggest that at least half of all those complications are preventable (2,3). This survey evaluated those incidents and complications and recommended the WHO Surgical Checklist use as an effective tool to decrease those complications.
Objective: To evaluate the complications related to surgery and anaesthesia prior to the implementation of the WHO surgical checklist at a National Referral Hospital (CHUK) in Rwanda. Methodology Design of study: Prospective analytic observational study. Setting: The survey was conducted in a University Teaching Hospital of Kigali, CHUK.
Methods: Data were collected during 3 months in operating room from 15th October to 15th January. We had in total 159 patients who arrived in operating rooms of CHUK. After the operation, the patients were followed during one week.
Results: During the 3-month period, we collected 159 patients and, among them, 158 were operated. Elective cases were 99(62.3%) and major operations were 86(54. 4%). GA was mostly provided to 104(65.4%), signed consent forms were 82(51. 6%) for surgery, while there were 70(44%) consents signed for anesthesia. Intraoperative incidents related to anesthesia were 29.5%: cardiovascular (85.1%) and respiratory (14. 9%). Low blood pressure was the most likely to occur with spinal anesthesia, 30% (P=.001). Overall postoperative complications were most likely related to emergency surgery with 38.3% complications rate, of which surgical site infection was the most noted complication related, 18.3 % (P=0.014). Only 49.4% of the patients were discharged early, versus 45.6% who were still in the hospital 7 days after surgery (P<0.001). There were 8 deaths (5.1%) and mostly associated with infection (P=0.01). In this group, there was a significant prolonged length of stay in the hospital (P<0.001).
Conclusion: Perioperative incidents and postoperative complications represent a challenge especially in developing countries. The implementation of WHO Surgical Checklist could be useful to prevent those complications.

References

1 Weiser TG, Regenbogen SE, Thompson KD, *et al.*. An estimation of the global volume of surgery: a modelling strategy based on available data. *Lancet* 2008; **372**: 139–44
2 Kable AK, Gibberd RW, Spigelman AD.: Adverse events in surgical patients in Australia. *Int J Qual Health Care* 2002; **14**: 269–76
3 Haynes AB, Weiser TG, Berry WR, *et al.*. A surgical safety checklist to reduce morbidity and mortality in a global population. *N Eng J Med* 2009,**360**: 491–9

Paper No: 394.00

A simple technique to reduce severe desaturation in propofol-sedated patients during short upper gi endoscopy

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Introduction: Patients routinely receive nasal cannula (NC) O2 and IV sedation during upper GI endoscopy (EGD). Oversedation and/or airway obstruction causes desaturation even during short EGD. A plastic sheet was shown to improve oxygenation in sedated patients by converting NC to face tent (FT) during lengthy EGD (1).
Objectives: We reviewed its effectiveness in preventing desaturation in propofol-sedated patients during short EGD.
Methods: Retrospective review of patients who underwent EGD, EUS, ERCP, EGD/Colonoscopy or PEG identified 2 groups. Group1 (NC, n=76) received NC O2. Group 2 (FT, n=263) received NC O2 and a clean plastic specimen bag covering eyes, nose and mouth(1-3). Patients received NC O2 (3-5 l/min) and IV propofol. Student t-test and Chi Square test were used for analysis. A p value <0.05 was considered as significant. (Mean¡ÀS.D.
Results: Among patients who underwent short EGD (¡Ü20 min), there were no differences in procedure duration (NC: 14¡À4 min; FT: 13¡À5), age (NC: 59¡À18 yrs; FT: 61¡À14), BMI (NC:27¡À5; FT:28¡À7), ASA Physical Status (ASA) (NC:2.2¡À0.7; FT:2.5¡À0.8), room air (RA) O2 Sat (97¡À2%) and propofol dosage (NC:236¡À83 mcg/kg/min; FT:242¡À108). There were significant differences in the highest O2 flow (NC: 5.8¡À2.2 l/min; FT: 5.0¡À1. 6), the lowest O2 Sat (NC: 87¡À13%; FT: 96¡À5%), severe desaturation (O2 Sat ¡Ü85%) (NC: 10/31; FT: 2/114) and bag-mask

ventilation (NC: 4/31; FT: 1/114). Thirteen NC patients had severe desaturation (O2 Sat: 78¡À13%) and FT was then added. O2 Sat was improved to 92¡À6%, 95¡À4% and 98¡À3% at 5-min intervals. Among patients who underwent lengthy EGD (>20 min), there were no differences in duration (NC: 39¡À15 min; FT: 43¡À16), age (NC: 60¡À18 yrs; FT: 60¡À15), ASA (2.2¡À0.7), BMI (NC: 26¡À4; FT: 27¡À7), RA O2 Sat (98¡À2%), highest O2 flow (NC: 4. 9¡À2.2 l/min; FT: 4. 8¡À1. 3) and propofol dosage (NC: 184¡À67 mcg/kg/min; FT: 180¡À59). There were differences in lowest O2 Sat (NC: 91¡À84%; FT: 97¡À4%), severe desaturation (O2 Sat ¡Ü85%) (NC: 11/45; FT: 2/149) and mask-bag ventilation (NC: 6/45; FT: 1/149). FT had higher FiO2 (Short: 0.51¡À0.15; Lengthy: 0.48¡À0.12) than NC (0.35¡À0.16).

Discussion: Data show that this technique prevents severe desaturation and reduces assisted ventilation in deeply sedated patients during short and lengthy EGD.

Conclusion: This simple face tent takes a few seconds to prepare and increases FiO2 without raising O2 flow. It may improve patient safety at no cost. Although this face tent can be used as a rescue device, it should be used for pre-oxygenation even during short EGD.

References

1 *Anesth* **107**:A922, 2007;
2 *Anesth* **102**: 484, 2005;
3 www.TSEMask.com

Paper No: 395.00

A SIMPLE TECHNIQUE TO REDUCE SEVERE DESATURATION AND THE NEED FOR ASSISTED BAG-MASK VENTILATION IN OBESE PATIENTS DURING CARDIOVERSION/ AICD TESTING

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Introduction: Patients routinely receive O2 via nasal cannula (NC) and IV propofol during cardioversion/AICD testing. Oversedation and/or airway obstruction may cause severe desaturation and require assisted bag-mask ventilation. Obese patients has increased risks of severe desaturation during sedation due to sleep apnea, decreased FRC and increased O2 consumption. A simple plastic sheet was shown to improve oxygenation in propofol-sedated patients by transforming NC to a face tent (FT) during upper GI endoscopy (1).

Objectives: We have used this technique in Cardiac Cath Lab and wish to confirm its effectiveness in preventing severe desaturation in obese patients during cardioversion/AICD testing.

Methods: Retrospective review of 171 patients who underwent cardioversion/AICD testing identified 2 groups. Group1 (NC, n=48) received NC O2. Group 2 (FT, n=123) received NC O2 and a clean plastic specimen bag covering the nose and mouth(1-3). Monitors included ECG, BP cuff and pulse oximetry. Patients received NC O2 (3-5 l/min or higher) and IV propofol. Data collected included age, weight, height, O2 Sat, bag-mask ventilation and the amount of propofol. Student t-test and Chi Square test were used for analysis. A p value <0.05 was considered as significant. (Mean¡ÀS.D.

Results: Among non-obese patients (BMI <30), there were no differences in age (NC:72¡À13 yrs; FT:67¡À14), BMI (NC:24. 3¡À3.5; FT:24. 4¡À3.3), ASA Physical Status (ASA) (all III), room air (RA) O2 Sat (NC:99¡À2%; FT:98¡À2%) and propofol dose (NC:1. 47¡À2.2 mg/kg; FT:1. 1¡À0.3). There were significant differences in NC O2 flow (NC:6.5¡À2.8 l/min; FT:4. 6¡À1. 3), O2 Sat after 5 min with O2 (NC:99¡À1%; FT:100¡À1%), the lowest O2 Sat (NC:87¡À11%; FT:97¡À3%), severe desaturation (O2 Sat ¡Ü85%) (NC:10/29; FT:0/74) and assisted bag-mask ventilation (NC:8/29; FT:0/97). Among obese patients (BMI>30), there were no differences in age (NC:66¡À11 yrs; FT:64¡À11), BMI (NC:34. 7¡À4. 7; F_i^3:37.1¡À6.2), ASA (all III), RA O2 Sat (98¡À2%) and propofol dose (NC:0.88¡À0.28 mg/kg; FT:0.77¡À0.31). There were significant differences in NC O2 flow (NC:8.1¡À2.4 l/min; FT:5.2¡À1. 9), O2 Sat after 5 min with O2 (NC:98¡À2%; TM:99¡À1%), the lowest O2 Sat (NC:83¡À11%; FT:94¡À8%), severe desaturation (O2 Sat ¡Ü85%) (NC:9/19; FT: 5/48) and assisted bag-mask ventilation (NC:10/19; FT:2/48).

Discussion: Data show that this technique improves oxygenation, prevents severe desaturation and reduces the need for assisted bag-mask ventilation in deeply sedated patients, especially obese patients, during cardioversion/AICD testing.

Conclusion: This face tent takes only a few seconds to prepare at no cost. It may have great impact on patient safety especially in obese patients and should be used for pre-oxygenation during cardioversion/AICD testing.

References

1 *Anesth* **107**: A922, 2007;
2 *Anesth* **102**: 484, 2005;
3 www.TSEMask.com

Paper No: 407.00

Thromboprophylaxis and regional anaesthesia in patients undergoing gynecologic surgery

Lidija Palashevska, Kiro Churlinov and Snezana Popovska

There are many advantages of regional anaesthesia for elective gynecologic surgery. Preoperatively many of patients receive anticoagulation drugs for treatment of other diseases such as deep venouse trombosis, pulmonary embolism and atrial fibrilation. There is possibility of seriouse complications

in these patients if methods of regional anaesthesia are performed. The outcome of patients who received anticoagulation drugs is analized after gynecologyc procedures, performed under regional anaesthesia.

We retrospectively evoluated all patients who had undergone operative procedure in a period of five years (2006-2010). The number of patients who received regional anaesthesia was presented. Patients treated with anticoagulation drugs were presented with regard to the preparation for operative procedures and perioperative complications.

In period from 2006-2010y the total number of patients was 6251. There were 1835 patients with regional anaesthesia. The number of spinal anaesthesia was 1664. Among them 182 patiets received anticoagulation drugs preoperatively. All these patients were admitted to hospital several days before procedures and bridge terapy was started. There were no complications as a result of preoperatively anticoagulations drugs tretment.Postoperatively 17 patients developed trombocitopenia. In 43 patients postoperative value of protrombin time was $<10\%$.

Regional anaesthesia is safe method in patients preoperatively treated with coumarin derivatives if these drugs are stopped and the bridge therapy with LMWH is started several days before the operation. Thromboprophilaxis with LMWH started the evening before surgery is a safe method in these patients.

References

1 Geerts HW, Heit J, Clagett GP, Pineo GF 2001 Prevention of venouse thromboembolism. *Chest* **119**: 132s–175s

2 Vandermeulen EP, Van Aken H, Vermylen J 1994 Anticoagulants and spinal-epidural anaesthesia. *Anaesth Analg* **79**: 1165–1177

3 Horlocker T, Wedel D, Benzon H, Brown D 2003 Regional anaesthesia in the anticoagulated patients: Definig the risks(The SecondASRA consenus conference on neuroaxial anaesthesia and anticoagulant). *Reg Anaest Pain Med* **28**(3): 172–97

4 Warkendin TE 1977 Heparin induced thrombocytopenia:pathogenesis,frequency,avoidance and management. *Drugs safety* **17**: 325–341

Paper No: 423.00

LOW-FLOW ANESTHESIA IN OBESE PATIENTS: COMPARISON BETWEEN DESFLURANE AND SEVOFLURANE

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Introduction: Desflurane is a rather new anesthetics with a very low blood-gas partition coefficient and low oil-gas partition coefficient. These should allow rapid wash-in and rapid emergence, even in obese patients. Because of its price and low potency, the low-flow technique is advised.

Objectives: This study was aimed to study the kinetic behaviors of desflurane compared with sevoflurane during high-flow wash-in, low-flow maintenance and early recovery profile in obese adult patients.

Methods: Forty unpremedicated obese adult patients (BMI 25-35) were enrolled to receive either desflurane or sevoflurane anesthesia. After induction of anesthesia, desflurane 4% or sevoflurane 1. 5% in a fresh gas flow of 6 L/min (N2O:O2=3:3) was administered via an absorber circuit After 10 minutes, the inflow was decreased to 1 L/min (N2O:O2=0.5:0.5) and desflurane or sevoflurane was then switched to 5% or 2% respectively, and maintained throughout the surgery. At the end of the procedure, the vaporizer was turned off and the inflow was back to 6 L/min of O2. Delivered concentration (FD), inspired concentration (FI) and end-tidal concentration (FA) of the anesthetics were measured and recorded from the start until extubation. The times from discontinuation of the anesthetics to eye opening on command and extubation were recorded.

Results: During high-flow wash-in, the FA/FI were comparable in both groups with the ratios of 0.89(0.05) vs 0.88(0.02) at minute 10. While in low-flow maintenance, the FI of both groups gradually increased with corresponding increases of FA. The FA at the end of the 1st hour was 4. 2(0.05) for desflurane and 1. 78(0.01) for sevoflurane. During the 1st hour of low flow, the FA/FI were not significantly different with the ratios of 0.91(0.03) vs 0.89(0.02) at minute 60 of low flow. When back to high flow of O2 at the end of surgery, desflurane was washed out faster than sevoflurane during the 1st minute with the FA/FAO of 0.35(0.05) vs 0.42(0.08) but not different afterwards. The recovery was faster in sevoflurane group with respect to the times to eye opening on command and extubation.

Conclusions: In unpremedicated obese adult patients, desflurane and sevoflurane provide comparably fast wash-in during the initial high-flow and the 1st hour of l L/min maintenance flow. However, desflurane has faster wash-out during the 1st minute and provides faster recovery. We recommend the FD of 5% for desflurane and 2% for sevoflurane during 1 L/min of maintenance flow as an economical and safe practice where the facilities are limited.

Reference

1 La Colla L, Albertin A, La Colla G, Mangano A. Faster wash-out and recovery for desflurane vs sevoflurane in morbidly obese patients when no premedication is used. *BJA* 2007; **99**: 353–8

Paper No: 425.00

IMPROVING PATIENT SAFETY IN PACU (POSTANESTHETIC CARE UNIT)

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Introduction: During the immediate postoperative, patients had decreased consciousness, temporo-spatial disorientation, and impaired mobility which involve a number of interventions in relation with the patient, the surrounding structure and the personnel that is designed to increase patient safety.
Objective: To analyze, using the methodology of FMEA, potential failure modes, their causes and corrective measures that can be done to reduce or resolve them, and design a checklist specific in URPA.
Material and Method: The methodology used was FMEA methodology, organizing a multidisciplinary team consisting of 4 FE Anesthesiology and Reanimation, Block 7 DU Surgical Nursing, 2 and 1 Nursing TC Celador.

Data collection was performed using a flow chart or analysis of the process, understanding as input when surgery is complete and output the time the patient is discharged from PACU, and therefore from the surgery zone. This analysis includes all the steps you take each professional involved in the process, detecting possible malfunctions, their causes and effects.

The risk assessment was done by calculating Risk Priority Numbers (RPN) that allow to define the possible causes of failure of most to least important, so find out where we should pay more attention.
Results: The result of this analysis have been the detection of 19 potential failure modes.
F1. Anesthetist cannot be localized. F2. Incorrect handling of anticoagulant therapy F3. Patient misidentification F4. Inadequate locoregional technique F5. Inadequate postoperative assessment F6. Improper aseptic technique F7. Improper handling of high-risk medication F8. Poor transmission of information to patients and family F9. There is no room to receive the patient F10. Improper handling of biological samples F11. Improper Hydric Balance F12. Improper management of VMI and NIV F13. Inadequate patient reception F14. Malfunction of the apparatus / equipment F15. Incorrect administration of treatment (drugs, fluids and blood products) F16. Care and / or improper nursing techniques F17. Medical Record Loss F18. Readmission after discharge in the APPU APPU F19. Inappropriate Discharge from PACU
Conclusion: After analyzing the NPR and the evaluation of improvement actions is a clear need to take measurements to preserve the safety of patient care in PACU admission, remain the priority, and in descending order, those related with the use of medication, effective communication, custody and organization of the medical history. The implantation of one checklist specific for de URPA may be the solution.

Paper No: 426.00

EVALUATION OF EFFICACY OF AMIKACIN FOR ATTENUATION OF CATHETER RELATED BLADDER DISCOMFORT IN PATIENTS UNDERGOING PERCUTANEOUS NEPHROLITHOTMY: A PROSPECTIVE, RANDOMIZED, DOUBLE BLIND STUDY

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Introduction: Bladder discomfort secondary to an indwelling urinary catheter is distressing, and it is not unusual to find patients catheterised under anaesthesia complaining of an urge to void in the postoperative period because of catheter related bladder discomfort (CRBD).
Objectives: Amikacin, a aminoglycoside antibiotic has been reported to significantly inhibit detrusor contraction in animal studies. The present study was undertaken to evaluate the efficacy of Amikacin in preventing CRBD in clinical setting.
Methods: 100 consecutive adult patients, ASA physical status I and II, either sex, undergoing elective percutaneous nephrolithotomy (PCNL) for renal and upper ureteric stones were randomly divided into 2 equal groups of 50 each to receive medications just before induction depending upon their group allocation. Group C (control): received Augmentin 1.2 gm and Levofloxacin 500 mg whereas Group A (Amikacin): received Augmentin 1.2 gm and Amikacin 10 mg/kg. Following induction of anesthesia patients were catheterised with a 16 Fr Foley catheter and balloon was inflated with 10 mL normal saline. In the post anaesthesia care unit CRBD was assessed at 0, 1, 6, 12 and 24 hrs after completion of surgery. Severity of bladder discomfort was graded as mild, moderate and severe.
Results: Amikacin reduced the incidence of CRBD to 44% (22/50) compared to 66% (33/50) observed in the control group ($P<0.05$). Amikacin also reduced the severity of CRBD (moderate) grade at 1 hr ($P<0.05$).
Conclusion: Amikacin (10 mg/kg) administered intravenously just before induction of anaesthesia significantly reduces the incidence and severity of CRBD in the post operative period.

References

1 Agarwal A, Raza M, Singhal V *et al.* Evaluation of efficacy of tolterodine for prevention of catheter related bladder discomfort: a prospective, randomized, placebo-controlled double blind study. *Anesth Analg* 2005; **101**: 1065–7

2 Agarwal A, Dhiraaj S, Singhal V, Kapoor R, Tandon M. Comparison of efficacy of oxybutynin and tolterodine for prevention of catheter related bladder discomfort: a prospective, randomized, placebo-controlled, double-blind study. *Br J Anaesth* 2006; **96**: 377–80

3 Agarwal A, Gupta D, Kumar M, Dhiraaj S, Tandon M, Singh PK. Ketamine for treatment of catheter related bladder discomfort: a prospective, randomized, placebo controlled and double blind study. *Br J Anaesth* 2006; **96**: 587–9

4 Agarwal A, Dhiraaj S, Pawar S, Kapoor R, Gupta D, Singh PK. An evaluation of the efficacy of gabapentin for prevention of catheter-related bladder discomfort: a prospective, randomized, placebo-controlled, double-blind study. *Anaesth Analg* 2007; **105**: 1454–7

Paper No: 449.00

CHANGES IN PSYCHOLOGICAL MOOD AND STRESS AFTER DAYTIME PRACTICE IN RESIDENTS

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Introduction: A short form of the Profile of Mood States (POMS) consists of thirty items which load on six different scales: tension-anxiety, depression-dejection, anger-hostility, vigor, fatigue, and confusion, thereby combining to achieve the mood disturbance score (MDS), an aggregate indicator of overall mood. On the other hand, salivary alpha amylase (SAA) levels have been suggested as a potential indirect marker for sympatho-adrenal-medullary activity and a predictor of plasma cathecholamine levels under a variety of stressful conditions.
Objectives: We examined how daytime anesthetic practice affects the residents in terms of psychological mood and stress.
Methods: Fourteen residents at our department were enrolled in this study. They usually took charge of 1 to 3 patients a day in the operating rooms. They received two measurements. One was the the mood meaured by POMS questionaires at 8:00 and 17:00, and the other was the stress assessed by SAA activity at 8:00, 12:00, and 17:00 using COCORO MeterTM (NIPRO Co, Osaka, Japan). Data were analyzed by paired t-test, or one-way analysis of varience, if appropriate. In all tests, a value of $p<0.05$ was considered statistically different.
Results: Among the six scales and the MDS, only fatigue demonstrated statistically significant differenes. Daytime anesthetic practice significantly increased the score of fatigue in the subjects. However, there were no significant differences in the hourly changes in SAA activity in the subjects.
Conclusions: In residents, daytime anesthetic practice increased fatigue while no particular sympathetic stress responsee were evoked.

Paper No: 454.00

QUALITY IMPROVEMENT AND JUST CULTURE: A COMPREHENSIVE APPROACH

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Introduction: Quality improvement (QI) is an aspect of patient safety based on evaluating cases and system issues. Historically, the morbidity and mortality conference has examined error with a focus on individual accountability. Recently, patient safety has focused on systems, recognizing that events often result from system weaknesses that leave the final action overly dependent on individual skill and decision-making, and open to human error resulting from inadequate information, distraction, or miscommunication. The goal of a "just culture" has been introduced, in which individuals and systems are accountable for failure to plan appropriately but not punished for unavoidable human error. We present a QI process which comprehensively evaluates events, close-calls, and systematic safety issues, and applies them to an educational program to advance the experience and knowledge of anesthesiology faculty, residents, and nurse anesthetists.
Objectives: 1) To advance the experience of individuals by sharing mishaps and discussing means of avoiding these situations in the future. 2) To identify potential or perceived safety concerns and address them.
Methods: Indicator cases are reported by anesthesia care teams, nurses, surgeons, or other departments. Cases are reviewed by a peer and presented to committee, and a standard of care determination is made along with the identification of opportunities for improvement in individual behavior or systems. Patient safety concerns not associated with a specific case are presented to a committee, who makes a determination regarding whether a change to departmental practice is necessary. Monthly, cases with teaching points and/or new policies along with relevant literature are presented and discussed with the entire department. Discussions are focused on issues and opportunities for improvement, and the facilitator is responsible for maintaining an atmosphere of respect and collegiality.
Results: Within our department, an openness to analyzing incidents and seeking improvement has developed, despite appropriate concern about legal issues. Although there is repetition of material due to the annual influx of new residents and staff, there is attention to areas in need of improvement and the benefit from learning from the mishaps of others. Several new policies and local guidelines have been developed which standardize care within the department and lend support to best practices over misplaced attempts at efficiency.
Conclusions: Creating a rigorous QI process alongside a just culture within a department is possible and beneficial. Our approach has much to offer departments who are working to develop a more productive and progressive system.

Paper No: 458.00

Management of Laryngeal Foreign Body with Ridid Fiberoptic Laryngoscope (Glidescope)

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Introduction: We present the first documented use of a Rigid Fiberoptic Laryngoscope for visualization and retrieval of foreign body from the supralaryngeal area.
Ojectives: This is the first documented use of a rigid laryngoscope for retrieval of a foreign body from the supralaryngeal area.
Methods: Anesthesia performed direct laryngoscopy under propofol sedation with ENT on stand-by after unsuccessful attempts at foreign body retrieval with rigid forceps.
Results: The ENT team was consulted and performed a flexible fiberoptic exam of the oropharynx and laryngopharynx which revealed a foreign body (celery stalk) overlying the vocal cords.
Discusion/conclusions: We This was a 74 year old male with a history of multiple strokes and vascular dementia in the medical intensive care unit for CPOD exacerbation. ENT was consulted after patient was noted to have an episide of choking while eating dinner and inability to clear oral secretions as well as shortness of breath. There was difficulty in removing the foreign body by ENT and after several attempts the anesthesia service was consulted to provide sedation/anesthesia for retrieval. After careful titration of propofol to achieve Ramsey Score of 3, anesthesia service performed direct laryngoscopy with a GlideScope, and the vegetable matter was seen in the supralaryngeal area. A Magill forceps was used to retrieve the foreign body, under glidescope visualization. After the retrieval, another laryngoscopy was performed to confirm no further foreign material in the oropharynx. the patient was recovered in usual fashion, with an uneventful recovery, and no sequelae of aspiration.

Paper No: 466.00

SURVEY OF SURGICAL PERSONNEL TO ENACT THE â€œRACE-PASS*â€ FIRE SAFETY PLAN

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Introduction: Most hospitals rely upon the use of the RACE-PASS acronym to remind employees of actions to perform during a fire involving patient care areas. Many accrediting agencies, such as The Joint Commission, have adopted RACE-PASS as a performance measurement and have encouraged employee memorization.
Objective: To assess if surgical staff are capable of performing RACE-PASS actions or merely recite the steps.
Methods: Surgical personnel familiar with RACE-PASS were personally surveyed to assess ability to carry out the RACE-PASS plan. Questions addressed previous education pertaining to OR fires, identification of the nearest fire extinguisher, medical gas supply cut off, and fire alarm pull stations.
Results: 118 Surveys were performed with the staff of 31 operating rooms and 2 procedure areas. The staff consisted of Surgeons (n=17), Surgical Technologists (n=17), Circulating Nurses (n=28), and Anesthesia Providers (n=56). Of the Surgeons, four (23.5%) stated they had formal education pertaining to OR Fires, one (5.9%) could locate the nearest fire extinguisher, two (11.8%) could locate the gas cut off, and two (11.8%) could locate the nearest pull station; of the Surgical Technologists, fourteen (82.4%) stated they had formal education pertaining to OR Fires, seven (41.2%) could locate the nearest fire extinguisher, nine (52.9%) could locate the gas cut off, and four (23.5%) could locate the nearest pull station; of the Circulating Nurses, twenty-six (92.9%) stated they had formal education pertaining to OR Fires, eight (28.6%) could locate the nearest fire extinguisher, seventeen (60.7%) could locate gas cut off, and three (10.7%) could locate the nearest pull station; and finally, of the Anesthesia Providers, twenty-six (46.4%) stated they had formal education pertaining to OR Fires, six (10.7%) could locate the nearest fire extinguisher, fourteen (25%) could locate gas cut off, and three (5.4%) could locate the nearest pull station.
Conclusions: The survey results suggest that a lack of knowledge pertaining to the location of life safety equipment such as fire extinguishers and fire alarm pull stations would impair the ability of OR personnel to activate an alarm or use a fire extinguisher during an actual fire. Use of RACE-PASS may be an effective tool if combined with education and orientation to life safety equipment needed to carry put the steps, but not as a stand alone tool. The survey also indicates that anesthesia providers do not participate in educational specific to OR fires to the extent of other surgical personnel.

References

1 *RACE PASS- Rescue, Activate, Confine, Evacuate - Pull the Pin, Aim Extinguisher, Squeeze the Handle, Sweep Side to Side ECRI Institute. New clinical guide to surgical fire prevention [guidance article]. *Health Devices* 2009 Oct;**38**(10): 314–332

Paper No: 471.00

Comparison of sevoflurane volatile induction and maintenance anesthesia and propofol-fentanyl total intravenous anesthesia for mini-invasive biliary tract surgery

Pavel Daniljuk and **Nikita Trembach**

Introduction: Biliary disease, complicated by obstructive jaundice is a condition requiring emergency surgery. Liver failure occurs in these patients may adversely affect the anesthesia and recovery period.
Objectives: This study was designed to compare the efficacy and safety of propofol-fentanyl total intravenous anesthesia and sevoflurane volatile induction and maintenance anesthesia in patients during the minimally invasive surgical interventions on the biliary tract.
Methods: 139 ASA III patients with biliary tract pathology, complicated with obstructive jaundice undergoing drainage of the bile duct under ultrasound (duration 42 (34–53) minutes), were allocated randomly to receive propofol-fentanyl total intravenous anesthesia (TIVA group, 67 patients) or sevoflurane volatile induction and maintenance anesthesia (VIMA group, 72 patients). Average Child-Turcotte-Pugh score did not significantly differs between the groups and corresponded to the class B. Average MELD score was comparable between two groups ($13,4 \pm 3,35$ for TIVA group vs. $14,2 \pm 2,67$ for VIMA group). Were assessed: the time of loss of consciousness, time to intubation, time of recovery of consciousness, time to extubation, time to full orientation, adverse effects of anesthesia, postoperative pain (Numeric Rating Scale).
Results: Induction time, as well as time to intubation was 1.5 times less in propofol-fentanyl anesthesia (64 ± 12 sec vs. 92 ± 24 sec ($p<0,05$) and $4,2 \pm 0,32$ min vs. $6,5 \pm 0,51$ min ($p<0,05$)). Time of recovery of consciousness ($15,4 \pm 2,5$ vs. $8,6 \pm 1,2$ ($p<0,05$)), however, as well as the time of extubation ($16,8 \pm 3,1$ min vs. $9,3 \pm 1,8$ min ($p<0,05$)) and time to full orientation ($18,9 \pm 4,2$ min vs. $11,5 \pm 2,5$ min ($p<0,05$)) in TIVA group were almost two times higher. Involuntary movements were noted in 14 patients in TIVA group (21%) vs. 5 patients in VIMA group (11%). The incidence of PONV was 7% (5 cases) in the VIMA group and 4,5% (3 cases) in TIVA group. There were no significant differences between the groups in pain score ($2,3 \pm 1,4$ in TIVA group and $2,7 \pm 1,3$ in VIMA group) and in patient satisfaction with anesthesia (90% vs. 93%).
Conclusion: The method of sevoflurane volatile induction and maintenance anesthesia compared with propofol-fentanyl total intravenous anesthesia in patients with obstructive jaundice for mini-invasive biliary tract surgery provides a significantly earlier recovery from anesthesia with a comparable incidence of adverse effects.

Paper No: 481.00

Convulsions after Ropivacaine infusion 225 mg for Psoas Compartment Block

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Introduction: Ropivacaine is a safe long lasting local anesthetic using in peripheral nerve blocks techniques. Ropivacaine side effects such as convulsions have been reported after inadvertent intravascular injection or the administration of a large dose.
Objectives: We describe grand mal convulsions occurring after administration of ropivacaine 225 mg in a healthy, young patient undergoing surgical management for deep wound trauma in right knee.
Methods: A 24-yr-old male (ASA I, 73 kg, and 176 cm) scheduled for urgent repair of deep penetrating trauma of anterior-lateral aspect of right knee. He had white medical history and he didn't smoke tobacco or drink alcohol regularly. The laboratory examinations were unremarkable. In the operating theatre, monitoring of arterial pressure, ECG, and SpO2 was instituted, and venous access was secured. The patient placed in Sims position. After disinfection and local infiltration of the skin and subcutaneous tissues, an 8 cm, 20 G, short bevel insulated needle was introduced to psoas muscle to anesthetize the lumbal plexus (according to Xapdevila et al). With a current of 0,78 mA and minimum elicitation of quadriceps muscle contractions, after a negative aspiration test, 30 ml of Ropivacaine 0,75% was injected over 1 min in 3–4 ml increments with repeated negative aspiration. 39 seconds after Ropivacaine injection, the patient suddenly developed a grand mal convulsion, and became apnoeic with extreme salivation and unconscious. Lung ventilation by face mask with 100% oxygen was started and Midazolam 5 mg given IV plus 100 mg Pentothal. The seizures stopped after 20 seconds and regular spontaneous respiration returned. Due to stable cardiovascular system, and normal arterial gas blood analysis (PH=7.39, PO2=278 mmHg, PCO2=41 mmHg, BE=−7.2) we decided to continue the operation with the patient in spontaneous breathing via Venturi mask with FiO2=0,4. The surgery lasted 32 min, the patient remained in PACU for two hours without any problem. Neurological examination performed the day after surgery did not reveal any abnormality.
Conclusions. We hypothesized that an intravascular injection of local anesthetic in this high dose produced this unwanted phenomenon. Frequently aspiration for blood didn't secure the intravascular placement of the tip of the needle. The regional anesthesiologist must be aware of early signs and symptoms of CNS intoxication (in our case report there were not) such us metallic taste, tinnitus, dizziness, anxiety. The convulsions must be treated effectively with oxygen, lung ventilation, and IV administration of Benzodiazepines.

Paper No: 485.00

AN INVESTIGATON OF THE INFLUENCE OF TYPE OF ANAESTHESIA ON THE PATENCY OF UPPER LIMB ARTERIOVENOUS FISTULAE AT THE TORONTO GENERAL HOSPITAL

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Introduction: The establishment and maintenance of long term vascular access for dialysis of patients with end stage renal disease is associated with significant morbidity and cost [1,2]. Upper limb Arteriovenous fistula (AVF) creation is the preferred method for long term vascular access [3]. However a significant number of these fistulae fail to develop enough to allow hemodialysis [4]. It has been suggested that the use of brachial plexus blocks during AVF creation may increase the likelihood of AVF maturation [5,6].
Objective: To determine if the use of a brachial plexus block during the creation of an AVF decreases the rate of failure of AVF maturation.
Methods: Data was collected retrospectively from all patients who had primary creation of an AVF at the Toronto General Hospital between January 2007 and December 2009. Data collected included: age, gender, American Society of Anesthesiologist (ASA) score, height, weight, body mass index, presence of diabetes mellitus or peripheral vascular disease, location of AVF, type of anaesthesia and rate of fistula maturity at 6 weeks and 3 months. Data were analyzed using STATA 12.
Results: A total of 207 patients underwent AVF creation during the study period. During these procedures 111 patients received local anaesthesia and sedation, 53 received a brachial plexus block and 43 received general anaesthesia. The demographic information of the patients receiving the different anaesthetic techniques was similar. At 6 weeks the AVF patency rates for patients which had local, general and regional anaesthesia were 66.7%, 67.4% and 50.9% respectively ($p=0.071$). At 3 months the patency rates were 69.4%, 66% and 67.4% respectively ($p=0.848$). On further multi-variant analysis the type of anaesthesia had no influence on AVF patency rates.
Conclusion: The use of a brachial plexus block during AVF creation did not decrease the rate of failure of maturation of the resulting fistulas.

References

1 Feldman HI, Kobrin S, Wasserstein A, Hemodialysis vascular access morbidity. *J Am Soc Nephrol* 1996. **7**(4): p. 523–35
2 Porile JL, Richter M, Preservation of vascular access. *J Am Soc Nephrol* 1993. **4**(4): p. 997–1003
3 Jindal K, *et al.*, Hemodialysis clinical practice guidelines for the Canadian Society of Nephrology. *J Am Soc Nephrol* 2006. **17**(3 Suppl 1): p. S1–27
4 Mercado C, *et al.*, Early and late fistula failure. *Clin Nephrol* 2008. **69**(2): p. 77–83
5 Malinzak EB, Gan TJ, Regional anesthesia for vascular access surgery. *Anesth Analg* 2009. **109**(3): p. 976–80
6 Hingorani AP, *et al.*, Regional anesthesia: preferred technique for venodilatation in the creation of upper extremity arteriovenous fistulae. *Vascular* 2006. **14**(1): p. 23–6

Paper No: 494.00

AN AUDIT OF THE INCIDENCE OF ADVERSE EVENTS IN INTENSIVE CARE, AND THEIR EFFECTS ON LENGTH OF STAY AND MORTALITY

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Introduction: Adverse events (AE) are defined as â€œinjury related to medical management, whether preventable or non-preventableâ€ (1). Data regarding AE incidence varies. In critical care, due to increased care complexity, the risk of AEs is increased. An incidence of AEs of 15.4% is reported, with increased length of stay (LOS) and mortality (2,3).
Objectives: By auditing reasons for admission to ICU we hope to characterise AEs, identifying factors which may reduce mortality, LOS and cost.
Methods: This audit analysed ICU admissions over two months. AEs were divided into two groups; those leading directly to admission; and those occurring on ICU. Data collection was from patients' notes, and from ICU admission books. Primary outcomes were ICU LOS and mortality on ICU. Cost-analysis based on LOS was performed. Audit data was compared with contemporaneous ICNARC data, ensuring data collected represented ICU casemix. Over two months, 158 patients were admitted to ICU - 130 surgical and 28 medical; 71 emergency and 87 elective. Of the admissions, 40 patients experienced an AE; 25 of these prior to admission, whilst 16 occurred on ICU. 28 were surgical, 8 anaesthesia/ICU, and 5 medical.
Results: Adverse events were associated with a mortality of 35%, compared to a mortality of 10.1% in the non-adverse event group. The adverse event group had a mean length of stay of 8.1 days, as opposed to a mean length of stay in the non-adverse event group of 3.9 days. Cost-analysis was based on number of bed-days incurred by the AE (average 4.2 days longer in the AE group) at a cost of Â£1212 per ICU bed per day, i.e. Â£5090 extra per patient; a total cost of Â£203,616 for the two months.
Conclusions: In our audit an AE caused a mean increase of ICU LOS of 4.2 days (Mann Whitney test, $p<0.05$), and threefold increase in mortality ($p<0.001$). Most AEs were surgical. These findings support evidence that AEs increase LOS and mortality. Reducing AEs would improve outcomes, and reduce costs. The nature of the AEs suggests that improvements could be achieved by focusing on preventing AEs throughout the hospital. Increased awareness, planning, and education could impact on AEs. We would also advocate a more robust adverse event reporting culture. Comparison

with ICNARC suggests that our data is representative of ICU casemix. Of note, ICNARC does not have a function to identify AEs.

References

1 WHO, WHO Draft Guidelines for Adverse Event Reporting and Learning Systems, 2005

2 Garrouste-Orgeas M, *et al.* â€œSelected Medical Errors in the Intensive Care Unit. *Results of the IATROREF Study: Parts I and IIâ€ Am J Resp & Crit Care Med* **181** (2):134.2010

3 Brennan TA, *et al.* â€œIncidence of adverse events and negligence in hospitalized patients: Harvard Medical Practice Study I." *N Engl J Med*. 1991; **324**,6: 370–376â€

Paper No: 509.00

A comparison of the influence of 2.7% sorbitol-0.54% mannitol and 5% glucose irrigating fluids on plasma serum physiology during hysteroscopic procedures

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Introduction: 2.7% sorbitol-0.54% mannitol has been selected as an alternative irrigating fluid during endoscopic surgery for its theoretical advantages. We compared the influence of 2.7% sorbitol-0.54% mannitol(Urosol, CJ pharma, Seoul, Korea) and 5% glucose as an irrigating solution for hysteroscipic myomectomy & polypectomy in the occurrence of associated complications.
Methods: Thirty patients scheduled for a hysteroscopic operation were included in a prospective randomized trial comparing 2.7% sorbitol-0.54% mannitol solution (Group S, n=15) and 5% glucose (Group G, n=15) as an irrigating fluid. We recorded the amount of the irrigating fluids, the amount of fluid intake, and the duration of the procedure. Serum sodium, chloride, potassium, glucose values, and serum osmolality were measured before (just after the induction, T1), during (when 2 L of irrigation fluid was infused, T2), and after (1 h after the end of the operation, T3) the hysteroscopic procedure.
Results: The mean volume of absorbed irrigating fluid was 185.0 ¡¾ 73.5 ml in Group G and 175.4 ¡¾ 50.5 ml in Group S. Transient hyperglycemia occurred in one patient of Group G. No differences were found in the intraoperative and postoperative levels of serum sodium, potassium, chloride, glucose and osmolality in both groups.
Conclusions: There was no clinical evidence of hyponatremic hypoosmolality in any of the patients. We found no difference between 2.7% sorbitol-0.54% mannitol and 5% glucose as an irrigating fluid for hysteroscopic procedures with mild to moderate irrigant absorption.

Paper No: 510.00

Intraocular Pressure Changes During Induction andIntubation : A Comparision of Sevoflurane and Desflurane

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Introduction: During ophthalmologic surgery, various intravenous anesthetic induction agents are used to prevent an intraocular pressure(IOP) increase. This study was designed to compare the effects of sevoflurane and desflurane on IOP in patients who were intubated.
Method: Thirty-two patients undergoing elective strabismus an entropion surgery, aged 6 to 15 years, were randomized to receive sevolfurane(Grout S, n=16) or Desflurane(Group D, n=16), IOP, mean arterial pressure(MAP), heart rate(HR), cardiac index(CI), stroke index(SI) were measured at the following time points: prior to induction(B); after the administration of the induction agents; before intubation(AI); and at 1, 3 and 5 mins after intubation(T1, T3 and T5).
Results: The IOP after induction(AI) were significantly lower than Base(B) in both groups. MAP at T1(1min after intubation) in Group S was significantly lower than Group D. HR at T1, T3 in Group S was significantly lower than Group D. CI & SI were not significantly differ between group.
Conclusion: Sevoflureane and Desflurane have no clinically significant effects on IOP, MAP, HR, CI or SI in children.

Paper No: 518.00

C band and post operative nausea and vomiting

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Introduction: With the development of Science and Technology, thousands of operations are done through general anesthesia evry day. Although undeniable progress in anesthesia led to good results in operation. Many sick people suffer from some adverse effects after anesthesia. the phenomenon of post operative nausea and vomiting is one of them. Pressure Medicine a branch of Acupuncture is mentioned have control on nausea and vomiting after operations.
Methods: The study is a double blind experience. The under research society included sick men in general operation

section in Baghiatallah and Valiasr Military Hospitals of NAJA in Tehran. objects undergone who have of them stomach operation for the first time and One hundred seventy four of them were chosen in this study. Sampling was continuous and the subjects were grouped randomly in three groups With 58 participants in it hamely : acupuncture group (therapy group), control group and therapist group.

According to its goals the checklist and c-band were used according to the groups of this study. After gathering the samples, the data were analyzed by statistics Software SPSS, edition 15, and ANOVA and T- test for analyzing the descriptive and the deductive statistics.

Results: Average age of the samples were 20–66 and 39+ _6 y. Also the average weight of the samples was 66 kg with standard deviation 11, and through demographic information the samples had no meaningful differences.

Conclusion: Using the C - band reduced nausea and vomiting after the operation that showed meaningful difference between therapist group and the witness group.

Keywords: C-band; abdominal surgery; nausea and vomiting

Paper No: 546.00

Non-technical skills in anesthesia providers in rwanda: an ethnography

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Introduction: Patient safety in the operating room can be jeopardized by poor team working and communication. Estimates are that 70 to 80% of anesthetic and surgical untoward events are caused by human factors.1 The Anaesthetists' Non-Technical Skills (ANTS) framework was developed to explore human factors and identify behavioural markers that influence safe practice of anesthesia.2 ANTS have been studied in European, Australian, and North American centres but there are no reports of use of this framework in developing countries.3

The operating room environment in developing countries is particularly stressful, with major clinical demands, few mentors, and scarce resources.4 In this setting, ANTS such as situational awareness, decision-making, task management and team working are especially important to prevent untoward events and improve peri-operative patient safety.

Objectives: The purpose of this qualitative study is to obtain a clear description and understanding of how ANTS are currently practiced by anesthesia providers at two tertiary care hospitals in Rwanda.

Methods: We used an ethnographic approach combining interviews and observations. Semi-structured interviews were conducted with eight non-Rwandan anesthesia providers with previous experience teaching in Rwanda. Observation of non-technical skills currently being practiced by Rwandan anesthesia providers was also undertaken. A hybrid discourse analysis approach was used to evaluate raw data from both interviews and observations. Data was coded in an iterative fashion, allowing emerging themes to inform subsequent interviews and analysis by identifying themes that emerged rather than trying to categorize behaviours according to the ANTS framework. Data collection is ongoing.

Results: Preliminary results identified three themes: situation awareness, cultural factors, and the challenges of working in a resource-poor setting, all of which have a direct impact on communication, which affects patient care. Lack of mentorship, combined with scarce resources, creates resignation to poor outcomes, which manifests as lack of recognition of clinically significant events and creates difficulty applying anesthesia theory to practice.

Anesthesia providers in Rwanda work in a culture in which formality, politeness and hierarchy are important. These influences may lead to a lack of assertiveness/discomfort with leadership, resulting in poor role definition.

Great potential for improvement has been recognized through the introduction of daily anaesthesia team meetings, which allows coordination and planning of team activities.

Conclusions: A complex relationship exists between factors influencing the safe provision of anesthesia in Rwanda. It is expected that designing a framework to address leadership and communication may lead to better team coordination and improved patient care.

References

1 Schaefer HG, Helmreich RL, Scheidegger D. Safety in the operating theatre–part 1: interpersonal relationships and team performance. *Curr Anaesth Crit Care* 1995; **6**: 48–53

2 Fletcher G, Flin R, McGeorge P, Glavin R, Maran N, Patey R. Anaesthetists' Non-Technical Skills (ANTS): evaluation of a behavioural marker system. *Br J Anaesth* 2003; **90**: 580–8

3 Flin R, Patey R, Glavin R, Maran N. Anaesthetists' non-technical skills. *Br J Anaesth* 2010; **105**: 38–44

4 Hodges SC, Mijumbi C, Okello M, McCormick BA, Walker IA, Wilson IH. Anaesthesia services in developing countries: defining the problems. *Anaesthesia* 2007; **62**: 4–11

Paper No: 566.00

Hemodynamic monitoring during anesthesiological maintenance of neurosurgical operations of cranial-facial resections

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The choice of method of hemodynamic monitoring is very important during anesthesiological maintenance during cranial-facial resections,which are enduring, painful and always accompanied by massive hemorrhage. Whether to prefer invasive or non-invasive methods of monitoring to provide safety of the patient and get the most reliable data. Considering influence of a massive hemorrhage and deficiency of blood volume on a functional condition of cardiovascular system, along with the standard methods of monitoring we performed invasive monitoring of the central hemodynamic using PiCCOplus monitor at 18 ASA IY patients (16–76 y.o. with cranial-facial tumors (the 1-st group). All the patients had paraneoplastic syndrome and intoxication dew to their tumor, anaemia (Hb<80g/l), hypovolemia. We performed continuous monitoring of artherial blood pressure, cardiac index (CI), SV (Stroke Volume), GEDV (Global End-Diastolic Volume), dPmx, GPVRI (General Peripheral Vascular resistance Index), ITBVI (Intrathoracic blood volume index), ELWI (extra vascular lung water index), PVPI (pulmonary vascular permeability index) The continuous monitoring allowed us to influence operatively on a hemodynamic profile of the patient The application of monitor "PICCOplus" allowed us to carry out monitoring of an extra vascular lung water as sensitive criterion of adequacy of infusion therapy of massive hemorrhage. The volume of infusion during the period of thoracic-dorsal flap transplantation was 40 ml/kg? h: solutions of salts 10 ml/kg? h, solutions of hydroxyethyl starch 10 ml/kg? h, blood plasma 15 ml/kg? h, erythrocyte mass 5 ml/kg ? h. At 16 ASA IY patients (18–72 y.o. we used the non-invasive methods of registration ECG, HR, SpO2, MAP (Nihon Kohden), CI, index of contractility of a left ventricle, GPVRI («NICO Novametrix») The criteria of choice non-invasive method were the following:

-Operations without a thoracic-dorsal flap transplantation that significantly reduced hemorrhage caused by redistribution of a blood volume;

-The initial safe status of the patient (absence of expressed anemia, accompanying cardiovascular pathology);

-Possibility of catheterisation of the veins of the lower extremities together with vena cava superior (if d-dimer <500 ng/ml). At comparison reliability and the clinical importance of invasive and non-invasive techniques of intraoperational hemodynamic monitoring in 2 groups of patients, it is possible to assert that both methods objectively demonstrate a condition of peripheric vascular tonus and left ventricle function. The invasive monitoring is recomended in operations with thoracic-dorsal flap transplantation because of a massive denervation and deficiency blood volume because of an external hemorrhage and redistribution of blood volume.

Paper No: 570.00

Peripheral versus central routes for central venous cannulation – a review of complications

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Introduction: Peripherally-inserted central catheters (PICC lines) are gradually replacing conventionally inserted tunnelled or non-tunnelled central venous catheters in many clinical settings. The increasing use of PICC lines has, however, raised clinical concerns. Despite lack of convincing scientific evidence PICC lines are often preferred to conventional central venous lines based on presumed cost and time benefits and fewer mechanical complications.

Objectives: We undertook a systematic review of comparative studies assessing complications of peripherally and centrally inserted central venous catheters in various patient categories.

Methods: Twelve studies, reporting 3116 PICC lines, 2193 non-tunnelled and 819 tunnelled or venous access port centrally inserted lines, were included. Nine studies compared PICCs with non-tunnelled central lines and five studies compared PICCs with tunnelled central lines or venous access ports. Study settings and definitions of clinical outcome were found to differ considerably between the studies, and only one study was randomised Furthermore, outcome data was not assessed blindly, and in five studies the numbers of PICC and centrally placed lines were highly unequal (ratio of two or more).

Results: Radiographic malpositioning of the catheter tip (as reported in five studies reflecting 432 peripherally and 641 centrally placed lines) occurred more often after PICC placement (9.3 % vs. 3.4 %; OR 3.76 [CI 1.75–8.07]; P=0.0007). Thrombophlebitis (seven studies based on 24 038 peripherally and 62 302 centrally placed line indwelling days) was reported more often with PICC lines (78 vs. 7.5 per 10 000 indwelling days; OR 5.82 [CI 2.37–14.2]; P=0.0001). Catheter dysfunction (six studies reflecting 18 199 peripherally and 58 972 centrally placed line indwelling days) occurred more often during PICC use (78 vs. 14 per 10 000 indwelling days; OR 6.02 [CI 1.10–32.9]; P=0.04). There was no difference in catheter-associated infection rate (nine studies reflecting 68 048 peripherally and 76 277 centrally placed line indwelling days) between PICC and central lines (22 vs. 17 per 10 000 indwelling days; OR 0.83 [CI 0.28–2.50]; P=0.74).

Conclusions: There are few comparative studies of complications associated with the use of peripherally vs. centrally placed lines, and all studies but one are at risk of selection bias due to non-randomised design. We found that the risks of tip malpositioning, thrombophlebitis and catheter dysfunction favour clinical use of centrally placed catheters

instead of PICC lines, and that the two catheter types do not differ with respect to catheter-related infection rates.*
References *a modified version of the work already accepted for publication as an original article in Anaesthesia.

Paper No: 576.00

Universal introducer for placement of various types of laryngeal airways

Igor Idov and **Pavel Rylov**

Introduction: During introducing of the laryngeal airway entrance of cuff tip into true glottis should be avoided. The artificial airway should also not be placed opposite epiglottis or arytenoid cartilage. For this purpose the tip of duct cuff should be pressed to the posterior wall of the pharynx during introduction. Introduction of any laryngeal airway, except ProSeal, is performed with physician's hand. Under this condition hygiene of the patient's oral cavity is compromised; if inflatable cuff is bent, mucous membrane of oral cavity and stomatopharynx may be injured; it is difficult to control the position of inflatable cuff in a large stomatopharynx; there is a risk of physician's fingers injury during mask introducing; it could be difficult for an inexperienced anesthesiologist.
Objectives: Development of a universal introducer for placement of various types of laryngeal airways for general anesthesia during planned outpatient ophthalmic surgery.
Methods: A comparative estimation of supraglottic airways efficacy has been performed in ophthalmic patients during following operations: vitrectomy, scleral buckling, reconstructive operations on the anterior segment of the eye, squint surgery, evisceration, enucleation. Two types of disposable and reusable airways have been studied LMA-CLASSIC and LMA – Flexible. Two groups of patients, 20 persons in each have been formed. There were females/ males: 73% / 27%, aged from 1 to 70 years.
Results: We have developed an original introducer for LMA-CLASSIC and LMA–Flexible airways. Holding introducer with attached laryngeal airway in one hand, the physician opens patient's mouth with the other hand, moving the lower jaw upwards and forward. When the mouth is opened, the inflatable cuff is placed into it, and then anesthesiologist moves the cuff in one motion according to the anatomy of the hard palate and posterior wall of the laryngopharynx, using the introducer. Physical force should not be applied. Insertion of the airway into the hypopharyngeal space is performed until feeling of resistance. Before removing the introducer, the physician holds air tube slightly with the other hand, slightly forcing the mask down to prevent the inflatable cuff from coming out. At this step laryngeal airway takes the correct position, at this time tip of the cuff is located near the upper esophageal sphincter.
Conclusion: An universal introducer which enables introduction of laryngeal airways, guarantees correct position of airway in the laryngopharynx at first attempt, and excludes possibility of injury both to the patient and the physician has been developed and used in practice.

Paper No: 586.00

Incidence of bloodstream infection: prospective comparison of real-time ultrasound-guided catheterisation versus the landmark technique in short-term central venous catheters

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Introduction: The risk of catheter related bloodstream infection (CR-BSI) is clearly related to the conditions of insertion icu (1). The emergent ultrasound-guided technique offers advantages respect to the classical landmark technique: improves the success rate, reduces the number of attempts and the risk of arterial puncture, haematoma, haemothorax and pneumothorax (2). Unfortunately, this technique requires and additional equipment and manipulation.
Objectives: Our hypothesis is that ultrasound-guided technique doesn't increase the CR-BSI incidence in short-term central venous catherters (CVC).
Methods: A prospective non randomized study was conducted from May 2010 to May 2011 over all the central venous catheters (internal jugular, subclavian or femoral) inserted by the Anaesthesiology Department in surgical patients. The insertion technique was the standard according with the department protocols (3). The data recorded were: demographics of patients, eco-guided or landmark technique, anatomical place of insertion, theater or intensive care unit placement and CR-BSI incidence. The sample size was obtained from the CR-BSI incidence in a previous study in our centre (3) 365 and 170 patients for landmark and ultrasound-guided group respectively. For the statistical analysis a Fisher's exact test and Chi square was maid.
Results: A total of 546 catheters were included in the database. The landmark technique was the most frequent selected in 67.2% (n=367) of catheters vs 32.8% (n=179). In theatre were inserted 85.7% (n= 468) and 14.1% (n=77) in the Post-operative Intensive Care Unit. Cannulation of the internal jugular vein was chosen in 69.8%, the subclavian in 29.9% and femoral in 0.4%. The mean permanence time for the catheters was 6.6 days (SD 5.8). There were no significant differences in demographics, anatomical place of canulation, place of insertion (theatre or Intensive Care Unit) and days of permanence between the ultrasound-guided group and landmark method group. The incidence of CR-BSI was 1.3% (7 cases). There were no significant differences in the CR-BSI incidence between the ultrasound group (2 cases of 179) and the landmark group (5 cases of 367) ($p > 0.05$).
Conclusions: Ultrasound-guided technique does not increase CR-BRI risk in short-term CVC despite increased manipulation

during placement. We strongly recommend the routine use of ultrasound for the central venous catheter placement in surgical and critical care patients because there is a significant reduction in mechanical complications (4)(5)(6)(2) without incidence over the infectious complications. Randomized and bigger studies would be necessary to establish security in the high risk infection catheters (long-term, parenteral nutrition, high manipulation).

References

1 Pronovost P, Needham D, Berenholtz S, Sinopoli D, Chu H, Cosgrove S, *et al.* An intervention to decrease catheter-related bloodstream infections in the ICU. *N. Engl. J. Med.* 2006 Dec. 28; **355**(26): 2725–2732

2 Karakitsos D, Labropoulos N, De Groot E, Patrianakos AP, Kouraklis G, Poularas J, *et al.* Real-time ultrasound-guided catheterisation of the internal jugular vein: a prospective comparison with the landmark technique in critical care patients. *Crit Care.* 2006; **10**(6):R162

3 Terradas R, Riu M, Segura M, Castells X, Lacambra M, Alvarez JC, *et al.* [Results of a multidisciplinary and multifocal project to reduce bacteraemia caused by central venous catheters in non critical patients in a university hospital]. *Enferm. Infecc. Microbiol. Clin.* 2011 Jan.;**29**(1): 14–18

4 Gordon AC, Saliken JC, Johns D, Owen R, Gray RR. US-guided puncture of the internal jugular vein: complications and anatomic considerations. *J Vasc Interv Radiol.* 1998 Feb.;**9**(2): 333–338

5 Farrell J, Gellens M. Ultrasound-guided cannulation versus the landmark-guided technique for acute haemodialysis access. *Nephrol. Dial. Transplant.* 1997 Jun.;**12**(6): 1234–1237

6 Hayashi H. Does ultrasound imaging before puncture facilitate internal jugular vein cannulation? Prospective randomized comparison with landmark-guided puncture in ventilated patients. *Journal of Cardiothoracic and Vascular Anesthesia.* 2002 Oct.;**16**(5): 572–575

Paper No: 587.00

Total pancreatectomy and liver multiple metastases resection of a neuroendocrine tumor: anesthetic and surgical peri operative management

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Introduction: Neuroendocrine tumors are, slow-growing tumors, mainly localized in the gastrointestinal and pulmonary systems. Their diagnosis is suggested by the presence of specific hormones and only confirmed by histological andimmuno-histochemical studies. Primary pancreatic neuroendocrine (NE) tumors are usually functional and associated with syndrome of hormonal secretion and metastases. Pancreatic and liver surgeries for these tumors are challenging for anesthesia.

Objectives:

(1) To report a case of a 61 –yearold female with "carcinoid sindrome" due to a pancreatic neuroendocrine tumor.
(2) To critically review the diagnosis difficulties, the complex medical and surgical treatment, the anesthetic management and potential postoperative complications.

Methods: The patient was operated form a papailar thyroid tumor and had a insulin requiring diabetes. She presents glositis, epigastric pain, diarrhea and ulcerous hounds in legs since two years before the diagnosis. CT scan couldńt confirm the tumor at the beginning of the disease and MNR showed a pancreatic tumor with liver multiple metastasis. Serum hormones as cathecolamines, somatostatine and calcitonine were on normal range. Pre-operative biopsy was necessary to confirm the diagnosis of (NE) tumor. After Lutecium treatment that was not effective (confirmed with Octreotide Imaging Study). The patient went to surgery to a radical treatment of the disease. At that moment the patient present severe malnutrition. A total pancreatectomy with the surgical resection of 8 mayor metastases was performed. Alcoholization and radio frequency of other 22 metastases was performed with ultrasound guided. The surgery was Anesthetic technique was combined epidural and general anesthesia with local anesthetics and morphine was performed. Low PVC strategy was carefully managed because of the renal failure risk of this particular patient.
Results: The patient had a good inmediate postoperative outcome with hyperglycemic episodes that required insulin. The pain relief was excellent in the postoperative period and no respiratory restrictions were registry. A complication with the epidural catheter (respiratory depression) was presented possibly related to a mistake in drug administration. The problem was solved without squeal. Postoperative coagulopathy was transient and the catheter could be safety removed at the 4th postoperative day. Chylous ascites: Treated with total parenteral nutrition was a letal complication at 2 monts postoperative.
Conclusions: Neuroendocrine tumors are rare and diagnosis in usually delayed. Multidisciplinary treatment with oncologist and surgeons, as well as an adequate anesthetic management might improve surgical management and long term outcome of this patients.

Paper No: 589.00

Cricoid pressure is effective in occluding the esophageal entrance in anesthetized and paralyzed morbidly obese patients

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Introduction / Objectives: The current study was designed to assess the patency of the esophageal entrance during the application of cricoid pressure (CP) in anesthetized and paralyzed morbidly obese patients.
Methods: After IRB approval, written informed consent was obtained from 59 morbidly obese patients (BMI 40 - 70 Kg / m2), who were to undergo laparoscopic gastric bypass surgery. There were no contraindications to the use of the rapid sequence induction / intubation technique (RSII). After preoxygenation, RSII was performed and manual ventilation was avoided. CP was applied in all patients by the same anesthesiologist. Cricoid force was standardized by reproducing 40 N on a weighing scale. After complete relaxation and while CP was maintained, a second operator performed direct laryngoscopy using Glidescope® video laryngoscope. Orotracheal intubation was performed and mechanical ventilation was initiated. While CP was maintained, a lubricated gastric tube (GT; size 20 Fr) was advanced under direct vision to the entrance of the esophagus. A successful insertion was recorded as a patent esophagus (ineffective CP), whereas an unsuccessful insertion was recorded as a nonpatent esophagus (effective CP). The same procedure was then repeated using GT size 36 Fr. The view of the glottis and esophageal entrance was video-recorded. A third operator assessed the position of the esophageal entrance relative to the glottic opening during CP before and after GT insertion.
Results: During CP, it was not possible to insert either size GT into the esophagus of any patient. After release of CP, either size GT could be inserted freely into the esophagus. The esophagus was lateral to the glottis in 78% of patients (71% left; 7% right) before intubation. After intubation, it was lateral to the glottis in 81% of patients (78% left; 3% right), but did not change after GT placement.
Conclusions: The current study provides direct visual evidence that CP is effective in compressing the esophageal entrance in morbidly obese patients. The closure of the lumen was further demonstrated by the inability to pass a GT into the esophagus. Our results in morbidly obese patients are in agreement with the findings of an MRI study in normal volunteers1 demonstrating that the position of the esophagus is irrelevant to the efficacy of CP.

Reference

1 Rice *et al. Anesth Analg* 2009; **109**: 1546–52

Paper No: 590.00

Efficacy of cricoid pressure in occluding the esophageal entrance in normal subjects: a glidescope® study

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Introduction / Objectives: This investigation was designed to assess the patency of the esophageal entrance during cricoid pressure (CP) in anesthetized, and paralyzed normal patients using the Glidescope® video laryngoscope (GVL).
Methods: After IRB approval, written informed consents were obtained from thirty patients (15 men and 15 women; ASA physical status 1 and 2) undergoing surgery requiring tracheal intubation. Following preoxygenation, anesthesia was induced with propofol, fentanyl and cisatracurium. Mask ventilation was initiated using FIO2>0.9 and CP was applied in all patients by the same anesthesiologist. Cricoid force was standardized by reproducing 40 N on a weighing scale prior to each application. Patients who required release of CP to allow mask ventilation were excluded. After adequate relaxation was obtained, a second operator performed laryngoscopy using GVL. A third operator, blinded as to whether CP was being applied, attempted to insert lubricated gastric tubes (GTs), size 20 and 36 Fr, applied sequentially, into the esophagus. A successful insertion was recorded as a patent esophagus (ineffective CP), and an unsuccessful insertion was recorded as nonpatent esophagus (effective CP). The view of the glottis and the esophageal entrance was video-recorded throughout the procedure. The position of the esophageal entrance relative to the glottic opening was assessed during CP before and after GT insertion.
Results: Manual ventilation was accomplished in all patients after placement of an oropharyngeal airway, while CP was applied and thus no patients were excluded from the study. Advancement of the GT into the esophageal entrance could not be accomplished during CP in any patient. Following release of CP, it was possible to introduce the GT with ease into the esophagus. The esophageal entrance was visualized left of the glottis in 60%, to the right in 10%, and in the middle posterior to the glottis in 30% of patients.
Conclusion: The current findings provide direct visual evidence that the esophageal entrance is completely compressed by CP. The closure of the lumen was further demonstrated by the inability to introduce a GT into the esophagus during CP. Our findings are in agreement with those of Rice et al. 1 obtained in volunteers using MRI, demonstrating that the position of the esophagus was irrelevant to the efficacy of the CP maneuver.

References

1 Rice et al. *Anesth Analg* 2009; **109**: 1546–52

Paper No: 595.00

The groote schuur emergency surgery triage system- a tool for improving patient care

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Introduction: Groote Schuur Hospital's emergency surgical service operates on more than 5000 cases per year. Lack of capacity in dealing with current patient loads has resulted in instances of adverse outcomes due to delays in patients'

access to the emergency operating room (EOR). Reasons for this relate primarily to demand outstripping supply, although avoidable issues, such as a lack of timely pre-operative assessment by busy on-call anaesthesiologists and the prioritising of cases by time and date of booking, rather than patient condition, were important contributors.

Objectives: To introduce a method of triage for all booked emergency surgical cases and improve pre-operative assessment by the anaesthesiology team responsible for their care, the aim being to ensure that the sickest patients have prioritised access to EOR.

Methods: Policy guidelines for the triage of all emergency surgical cases were promulgated in July 2009 using the Groote Schuur Emergency Surgery Triage System (GSESTS) developed exclusively for this purpose.

The GSESTS is modelled on the Cape Triage Score[1] colour coded categorisations. Emergency surgical cases are triaged by the admitting surgeon using the GSESTS as a guide. Additionally, all emergency cases are evaluated by a dedicated Triage Resident Anaesthesiologist (TRA) to ensure that all patients are adequately optimised prior to arrival in the EOR. Patients' surgical, demographic and triage colour code data are displayed in real-time on an electronic monitor outside the EOR. Cases whose suggested time-to-EOR expires are re-triaged to the same, more acute or less acute colour code after re-assessment by the TRA and surgeon concerned. The key performance indicator measured is the percentage of cases done within the time period indicated by their initial triage code (time of booking to arrival in EOR) [2].

Results: 7703 emergency cases were booked and 6,310 completed through the EOR (at an average of 15 cases per 24 hours) over a period of 418 days. Relevant data is shown in the table below.

Suggested and actual performance indicators for each triage colour code are shown(in and out of parentheses respectively) in the Key Performance Indicator column. No triage category met its expected targets.

Conclusion: The GSESTS tool has been embraced by all personnel involved in the care of emergency surgical patients. EOR capacity (personnel, operating time) will need to expand in order to meet and exceed key performance targets.

References

1 Wallis LA, Gottschalk SB, Wood D, *et al.* The Cape Triage Score- a triage system for South Africa. *S Afr Med J* 2006; **96**: 53–56

2 Emergency Surgery Guidelines. http://www.health.nsw.gov.au/policies/

Paper No: 647.00

Sugammadex as reversal agent in fast-track cardiovascular surgery

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Background and Goal of Study: Sugammadex revert neuromuscular blockade (NMB) by a mechanism that remains aside the complex physiology of the neuromuscular junction and body temperature. The hypothermia, use of some drugs such as magnesium, sevofluorane or renal failure due to hypoperfusion during cardiopulmonary bypass (CBP) make the neuromuscular blocking drugs (NMBD) elimination half life longer, with residual paralysis. The aim of the present study is to evaluate the outcome, useful and efficacy of sugammadex for fast-track extubation technique in the rocuronium-induced moderate blockade in cardiac surgery.

Methods: Consecutive patients undergoing elective cardiac surgery with CBP were enrolled. A moderately NMB (one or two responses of the TOF) was achieved with an infusion of rocuronium (0,1-0,2 mg/kg/h), using acceleromyography in the posterior tibial nerve to evaluate the level of blockade by means of Tof-Watch® and recording all the data "in silico" in a PC. At the end of surgery the NMB was reversed with Sugammadex 2 mg/kg. Rocuronium onset time, intubation conditions, surgery and CBP time, central and skin temperature, total rocuronium and sugammadex doses, time from start administration sugammadex to recovery a TOF >0.7, 0.8 and 0.9, and from sugammadex to extubation were measured. Data as mean (standard deviation).

Results: 6 patients, 4/2 (M/F), age 63 (12) years, weight 67 (14) kg, onset time 88 (27) sec, surgery time 244(39)min, CBP time 78 (47) min, Total rocuronium 89 (31) mg, sugammadex 139(34) mg. Recovery TOF $>0.7=94$ (33) sec, TOF $>0.8=119(37)$ sec, TOF $>0.9=144(55)$ sec, time from sugammadex to extubation 222 (132) min.

Conclusions. the use of NMBDs and neuromuscular monitoring is necessary in cardiac surgery. Sugammadex rapidly and effectively reversed moderate rocuronium-induced blockade in cardiac surgery. According to our scanty population results, the sugammadex security and efficacy can be useful when the "Fast Track" anaesthetic technique is carried out.

References

1 Hemmerling TM, Russo G, Bracco D. Neuromuscular blockade in cardiac surgery: An update for clinicians. *Ann Card Anaesth*. 2008; **11**(2): 80–90

2 Hemmerling TM, Zaouter C, Geldner G, Nauheimer D. Sugammadex–a short review and clinical recommendations for the cardiac anesthesiologist. *Ann Card Anaesth*. 2010; **13** (3): 206–16

Paper No: 653.00

Adherence to Strict Guidelines Eliminates Respiratory Complications in Obstructive Sleep Apnea Patients

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Introduction: The high incidence of respiratory complications in the perioperative management of patients undergoing correction of obstructive sleep apnea (OSA) is a major concern for anesthesiologists.1 In a quality management study in our institution, we found an incidence of 3.9% (5 out of 139 patients) between 1997 and 1999.2 In 2000, specific guidelines were adopted, which decreased the complication rate to 0.54% over a 7 year-period between 2000 and 2007 (11 out of 2,037 patients). 2

Objectives: This follow-up study was conducted to determine whether stricter guidelines could result in further reduction in respiratory complications.

Methods: After IRB approval for conversion of quality management data to research purposes, we compiled the respiratory complications in patients undergoing surgery for OSA for the last two years (2008 & 2009) while utilizing guidelines adopted in 2000 and implementing additional guidelines. The guidelines adopted from 2000 were: placing the patient in a ramped position before intubation, awake fiberoptic intubation in some patients, having various intubation devices available, control of blood pressure and heart rate before and after extubation, selective use of nasopharyngeal airways, following strict extubation criteria, extubation over an airway exchange catheter in select patients, extubation in semi-sitting position, and reinstitution of CPAP in the PACU whenever possible. The new guidelines were: more frequent use of awake fiberoptic intubation, liberal use of doxapram hydrochloride (1-2 mg/kg) before extubation, closer supervision of the resident staff, and tracheal extubation only in the presence of supervising faculty.

Results: In 789 patients, there were no respiratory complications during intubation or in the intraoperative period. Airway obstruction occurred in three patients (0.38%) soon after tracheal extubation; in one of these patients, negative pressure pulmonary edema with severe hypoxemia developed. All three patients required reintubation and ventilatory support, but were successfully extubated within 1-3 hours. Examination of these three cases revealed that our new guidelines were not completely followed; two extubations occurred in the absence of supervising faculty and one extubation occurred because of a miscommunication between the faculty and the resident.

Conclusions: Implementation and adherence to strict guidelines eliminated complications related to intubation and intraoperative management in patients undergoing surgery for correction of OSA. It is also possible that adherence to strict guidelines would eliminate postextubation airway obstruction as well.

References

1 Benumof JL. The American Association of Anesthesiologists OSA Guidelines. In: Hagberg CA Ed. *Benumof's Airway Management* Mosby, St.Louis, MO 2007

2 Nimmagadda U, *et al. Anesthesiology* 2008; **109**:A774

Paper No: 654.00

Anaesthetic "preflight" checklist

ii414

Carmen Ingrassia De Cruzado and **Mr. Ian Mc Lean**

Introduction: There is an ever increasing emphasis being placed on the reporting and prevention of Healthcare Incidents. The introduction of the WHO Surgical Site Checklist has proved its worth world wide in lives saved. In the UK, development of an Anaesthetic e-form (2009) in conjunction with the National Patient Safety Agency (NPSA), Royal College of Anaesthetists and Association of Anaesthetists Great Britain and Ireland has highlighted incidents in the area of Anaesthesia. Their pilot study reported the type of incidents most frequently reported were: medical device/ equipment (26%), respiratory problem (13%) and medication (12%).

An extract from a WHO press release dated 14 January 2009 states "Checklist helps reduce surgical complications, deaths" -"These findings have implications beyond surgery, suggesting that checklists could increase the safety and reliability of care in numerous medical fields," Dr Gawande said. "The checklists must be short, extremely simple, and carefully tested in the real world. But in specialties ranging from cardiac care to paediatric care, they could become as essential in daily medicine as the stethoscope."

Objectives: With the above in mind the Authors have designed an Anaesthetic checklist to be used in conjunction with the WHO form offering a simple structured approach to anaesthetic safety just prior to Induction.

Methods: All Anaesthetic requirements were identified through literature search and expert opinion. Initially two versions of the checklist were developed, one being a pictorial flow chart and the other a more traditional list. Over two periods of three months each were used in every day practice to assess their usefulness.

Results: By opinion, in practice the list format proved to be more useful. Being a tick list also had the advantage that other members of the anaesthetic teams could tell at a glance if everything was checked and ready promoting better team working.

Discussion: The aim of this project was to produce a simple tool to aid the Anaesthetist and anaesthetic support worker in ensuring that all the required equipment, airway adjuncts and medications were ready and available prior to Induction. Thomassen et al (3) demonstrated the usefulness of a checklist in such a clinical environment. Following the introduction of the Anaesthetic Pre-flight Checklist empirical evidence from users give an indication of improved patient safety

Conclusions: Having developed a good working tool it is hoped to move from a purely empirical approach and undertake a more rigorous statistical study on the introduction of this checklist

References

1 WHO Surgical checklist WHO Geneva Dan Epstein/Vivienne Allan Patient Safety Programme allanvi@who.int

2 NSPA Seven steps to patient safety: full reference guide Guidance 0034 July 2004

3 Thomassen O, Brattebo G, Softeland E, Lossius HM, Heltne JK. 2010 The effect of a simple checklist on frequent pre-induction deficiencies. *Acta Anaesthesiol Scand*. 2010 Nov; **54**(10): 1179–84

Paper No: 701.00

Self-positioning, induction of anaesthesia and placement of a laryngeal mask in the prone position before spine surgery

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Introduction: Traditionally anaesthesia to surgery performed in the prone position is induced with the patient in the supine position. The patient is then moved to the prone position. This method is time consuming, labor intensive and may postoperatively have a relative high incidence of pain from the muscles or joints or peripheral neuropathy.
Objectives: To test the hypothesis that self-positioning in the prone position followed by induction of anaesthesia and placement of a laryngeal mask would be a superior way (faster, fewer complications) to anaesthetize these patients,
Methods: A randomized study comprising patients scheduled for spine surgery (estimated to be <2 hours) was carried out. A total of 140 patients were randomized into two groups. In group LM the patients positioned themselves in the prone position, whereafter anaesthestia was induced and a Laryngeal mask (Proseal®) was placed. In group T anaesthesia was induced and the patient was intubated in the supine position whereafter the patient was placed in the prone position. In both groups the anaesthesia was induced with propofol and remifentanil in standardized doses and muscular relaxation was obtained by rocuronium.
Results: The 2 groups were comparable as regards age, sex and BMI and time of surgery. Four patients were excluded (in group T one patient who had to be intubated with a videolaryngoscope, in group LM one patient who had to be operated again for a haematoma and two patients in whom it was impossible to obtain a tight laryngeal mask). The time from start of induction to the patient was ready for surgery was 6 min faster in the LM group than in the T group ($p<0.01$) and the total time from arrival to the surgical theater to the patient was ready to go to the recovery room was 109 min and 133 min (median values), in the 2 groups respectively ($p=0.013$). The time spent in the recovery room was identical for the two groups. Although not statistically significant there was a strong tendency towards fewer complications in the LM group (sore throat, hoarseness, pain from muscles and joints, paraesthesia).
Conclusions: Induction of anaesthesia and placement of a laryngeal mask with the patient positioned in the prone position reduces the induction - to - incision time and the time spent in the operating theater. The self-positioning allows the patient to settle in a comfortable position, which probably reduces complications related to the placement on the operating table.

Paper No: 721.00

Developing a pediatric pain community of practice among seven hospitals in northeastern thailand

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Objectives: Pain is recognized as a global health problem by the World Health Organization, causing enormous human, economic, and social burden. Children are a vulnerable population, and are even more at risk in under-resourced environments. Pain affects children's immediate health and causes longterm disability and suffering. We describe development of a community of practice among seven Thai hospitals to establish basic knowledge and consistent care standards.
Methods: Action research methodology using Kitson's knowledge translation "PARIHS" framework (evidence, context, facilitation), incorporated a network of nurse facilitators, online discussion board, educational resources, workshops, and administrative support. Knowledge translation involves Thai and Canadian trainees and faculty. Social network analysis will inform the KT process and identify knowledge seekers, knowledge brokers, and knowledge donors. Exit interviews and surveys will identify changes in knowledge, attitudes, and practice.
Results: Baseline data highlighted undertreatment of children's pain and barriers to practice change. During the first 2.5 years of the project, all 7 hospitals established pediatric pain management policies, organized internal workshops for health professionals, and regularly assess and record children's pain in the patient chart. Several are extending assessment to adult units. Five hospitals have developed guidelines or protocols and have regular audits/quality management. Increased frequency of pain reporting by professionals, parents, and patients has been documented. Physicians show greater awareness of children's pain and pain treatment orders have improved to match standards of care. Parents express greater satisfaction with pain management and report improved communication with the healthcare staff. Individual hospitals and nursing units have developed innovative local techniques to improve pain care.
Conclusions: This program has resulted in the application of existing knowledge to changing practice, and serves as an evaluation of the PARIHS framework and a sustainable model for knowledge generation by and translation to clinicians in developing and developed countries.

Paper No: 728.00

Displacement of orotracheal tube after pneumoperitoneum in patients undergoing bariatric surgery

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Introduction: Laparoscopic bariatric surgery is considered a relatively safe method for the treatment of refractory obesity; nevertheless risks still remain. This procedure is performed under general anesthesia and orotracheal intubation. It also requires pneumoperitoneum that promotes an increase in the intraabdominal pressure. Pneumoperitoneum may cause cephalad displacement of the diaphragm and carina and move the endotracheal tube (ETT) to a bronchial mainstem. Endobronchial intubation in morbidly obese patients may cause serious complications and must be prevented.
Objectives: The aim of this study was to investigate the extent of displacement of the ETT produced by changes in intraabdominal pressure in obese patients undergoing laparoscopic bariatric surgery.
Methods: After obtain written consent, 22 adult patients submitted to bariatric surgery were enrolled in the study. Patients with abnormal tracheal anatomy or impaired pulmonary auscultation were excluded. After orotracheal intubation according to institutioń s routine and positioning of patients in 30° head up position, adequate ventilation of both hemithoraxes was confirmed by chest auscultation. Fiberbronchoscopy was used to check for unintentional endobronchial intubation and to estimate ETT tip-Carina distance. Procedures were repeated after pneumoperitoneum of 15 mmHg. Paired-samples t test was used to compare distances.
Results: Mean Body Mass Index was 38,7 ± 4,7 kg.m-2. There were no cases of endobronchial intubation. Mean deep of orotracheal tube (in relation to superior dental arch) was 21,8 ± 0,7 cm. There was a significant reduction in ETT tip-Carina distance from 2.8 ± 0.7 cm before pneumoperitoneum to 2,4 ± 0,7 cm after pneumoperitoneum ($p<0,001$). Mean difference was -0,4 ± 0,5 cm (Confidence Interval 95%: -0,2 to -0,7 cm); minimum 0,1 cm and maximum -2,2 cm. Conclusions There were significant changes in ETT tip-Carina distance after pneumoperitoneum insufflation. We recommend repetition of chest auscultation after pneumoperitoneum and check constantly for signs of endobronchial intubation in obese patients undergoing laparoscopic bariatric surgery.

References

1 Ogunnaike BO. Anaesthetic Considerations for Bariatric Surgery. Anesth Analg 2002;95:1793–1805
2 Sugiyama K. Displacement of the endotracheal tube caused by change of head position in pediatric anesthesia: evaluation by fiberoptic bronchoscopy. Anesth Analg 1996;82:251–253

Paper No: 733.00

The challenges of the morbidly obese patient for orthopedic surgery

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Introduction: The morbidly obese may present for surgery to treat the obesity or for a completely unrelated condition. The morbidly obese patient also has a higher morbidity and mortality in the perioperative period. (1)
Methods: A 58 year old woman with osteoarthritis who was scheduled for a total knee arthroplasty. Examination revealed a weight of 163kg, height of 1.52m, with a BMI of 70.55 Anesthesia was discussed and in view of a potentially difficult airway the patient was consented for a subarachnoid block with MAC sedation.
Results: After 15 minutes an incomplete block was achieved insufficient for operating purposes. The decision was made to proceed with general anesthesia. An airway cart was present in the room and after a smooth induction, ventilation was established, Succinylcholine 120 mg was administered and a rapid sequence induction performed. The patient was intubated with a Mac 3 laryngoscope as a grade ll intubation view. The patient was placed on the ventilator with tidal volumes of 600ml, a peep of 5 cmH2O and a rate of 12 bpm. Anesthesia was maintained with a combination of air, oxygen and desflurane. Analgesia was given as fentanyl increments. After 10 minutes the SpO2 started to decrease from 96% to 93%. The FiO2 was increased from 40% to 60% and the saturations increased once again to 96%. ABG revealed: pH 7.21, PCO2 65, PO2 55. At this point the tidal volume was increased to 750 ml although the plateau pressure was now noted to be 38cmH2O. The PEEP was also increased to 8 cmH2O. Over the following 10 minutes the heart rate dropped to 110 AF and the BP rose to 95/55 mmHg. Repeat ABG at 30 minutes revealed a pH of 7.27, pCO2 55, pO2 55. The case was completed after 90 minutes and the patient was transferred intubated to the ICU. The patient remained on mechanical ventilation in the ICU for 4 days.
Conclusions: Excess body mass leads to an increase in metabolic demand, resulting in increased cardiac workload, which in turn leads to left ventricular hypertrophy. (2) What we saw in this case was a classic VQ mismatch leading to hypoxia and hypercarbia. This in turn led to a tachyarrythmia, attempted control of which led to a downward spiral of events. (3) In the morbidly obese attention to pre, per and post operative care is vital in order to decrease morbidity and mortality in this population.

References

1 Gardner and Halweil 2000
2 Bray 1985
3 Perilli, Sollazzi et al. 2003

Paper No: 746.00

The Utility of the Upper Lip Bite Test for Safe Tracheal Intubation Training of Novice Residents

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Introduction: The upper lip bite test (ULBT) is the method to predict difficult laryngoscopy easily and rapidly. So far, there are few data investigating the benefit of applying this method to endotracheal intubation training of novice residents.
Objectives: To evaluate whether the ULBT score contributes to the safety of tracheal intubation training of novice residents in our institute.
Methods: Thirty-five cases undergoing elective surgery assigned to the novice residents, who receive two-months-training program of our anaesthesia department, were evaluated with the ULBT preoperatively. Whether each resident succeeded in endotracheal intubation was recorded, respectively.
Results: As the first-month-grader, no resident experienced successful intubation on the cases of two or more of ULBT score. In the second month, residents could facilitate tracheal intubation successfully in all the cases of ULBT=1 (success rate was 100%) and in the considerable cases of ULBT=2 (success rate was 72.7%). However, the success rate remained low in the cases of ULBT=3 (success rate was 25.0%).
Conclusions: The present results may indicate that the cases of ULBT=1 are suitable to uneventful training of endotracheal intubation for the second-month-grader residents. Therefore, we concluded that the ULBT score might be useful for establishing safe tracheal intubation training of novice residents.

Reference

1 Anesth Analg 2003;96:595-599

Paper No: 774.00

Chemical meningitis after sub arachnoid block for elective lower segment caesarian section

Surendra Singh

A 28 yr 2nd gravida with 38+ week pregnancy came to the hospital for management. She showed foetal macrosomia with a floating head. A Caesarian section was planned. After 06 hr of fasting she was posted for a lower segment Caesarian section. After a surgical scrub the operator wore gown and gloves. Patient's lower back was prepared with povidone-iodine solution and using all aseptic precautions a subarachnoid block was instituted with 12 mg of bupivacaine and 25 mcg of fentanyl using a 25 swg Quinke type spinal needle in the L3-L4 interspace in the 1st attempt. The surgery was uneventful and a 4 kg female baby was delivered. The mother developed a persistent headache from the immediate post-operative period which was non responsive to opioids or NSAIDs. Despite prophylactic management of PDPH the headache intensity increased and the patient became restless. CSF biochemistry and cytology showed increased proteins (115 mg/dL and high WBC count (250/mm3) with normal glucose. CSF film after Gram and AFB staining did not reveal any organism. Her anti-nuclear antibody was negative. Culture of CSF for 48 hr did not show growth of microorganisms. A neurology consultation was sought. A CT scan revealed generalized cerebral oedema. On the basis of biochemical and haematological markers and a negative CSF culture a diagnosis of chemical meningitis was made. The patient was managed conservatively. She was discharged from the hospital on the 10th post-operative day. One month follow up showed that she had recovered fully without any neurological deficit.
Outcome: Though our aseptic precautions were adequate, a proper and thorough wiping of a wide area of the back after part preparation and a change of sterile gloves after prep have been included in our standard operating procedures for attempting a sub-arachnoid block.

Paper No: 783.00

Nice and warm: did nice guidance on peri-operative hypothermia make any difference?

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Introduction: National Institute for Clinical Excellence (NICE) released guidance on inadvertent perioperative hypothermia in April 2008.
Objectives: To find out whether our hospital complied with NICE guidance and improved patient safety
Methods: In 2008 we did an audit before the implementation of NICE guidance in our hospital followed by an annual audit in 2009 and 2010. We audited 100 consecutive patients in September of each year. Results:Audit done in 2008 showed poor compliance. We developed local implementation programme and subsequent audit in 2009 showed significant improvement in practice. Sustained education and having separate Pre-Operative Preparation Area (POPPA) further improved compliance in 2010.
Audit Results: 2008 2009 2010 Temperature recorded within 2 hours before arrival to theatre 54 84 86 Patient came in with at least one sheet and two blankets or a duvet 32 52 84 Temp. checked before induction of anaesthesia 10 79 92 Is the operation expected to last longer than 30 minutes?

92 86 78 Intra-op 1. Bair hugger used 82 88 85 2. warmed IV fluids used 31 51 44 Temp. monitored during the operation 11 77 92 Temperature at the end of operation 11 77 92 Recovery Patient transferred to recovery with at least one sheet and two blankets or a duvet 22 66 89 Temp. on entry to recovery 92 96 99 Bair hugger used in recovery 21 11 9 Warmed IV fluids used in recovery 0 0 0 Temp. on discharge from recovery 40 75 80.

Conclusions: Hypothermia can result in delayed recovery, impaired wound healing, increased morbidity, costs and reduced theatre efficiency. We used simple, inexpensive device ClinitrendTM, which allows continuous non invasive measurement of temperature throughout the perioperative period. This increased the compliance with monitoring. In 2010 we developed Pre-operative preparation Area (POPPA) in the theatre complex where we stocked up blankets and duvets and patients were provided with above if needed. There was also trend towards moving minor & intermediate procedures to elective day case centre. Staff awareness, training and distribution of audit results year on year also helped in improving the compliance.

References

1 www.nice.org.uk/CG065

Paper No: 791.00

Duration and Severity of Delirium are Independent Predictors for Postoperative Cognitive Dysfunction

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Introduction: Especially elderly patients experience after general anaesthesia changes in mental function, namely postoperative delirium (POD) and postoperative cognitive dysfunction (POCD). These complications are associated with increased morbidity and mortality, functional decline, increased use of health care services and associated costs [1-3]. The aim of this prospective study was to investigate whether these entities of postoperative cognitive decline are associated with each other or not.

Methods: After approval by the local institutional review board and obtaining informed consent, patients aged $\geq$60 years with MMSE $\geq$ 24 undergoing elective non-cardiac surgery in general anaesthesia underwent preoperatively computer-based cognitive tests (CANTAB test battery). Screening of POD was performed twice daily until hospital discharge by using DSM –IV criteria and Nu-DESC screening scores. Thereafter, on postoperative day 7 and 90 all patients were cognitively tested again. Statistics: Chi-square test, Mann-Whitney U-test, logistic regression analysis.

Results: Table 1 shows the incidences of POD and POCD of the 1175 patients that have been tested in this study. Univariable analysis demonstrated a significant correlation between POD in the recovery room and POD on the ward ($p < 0.001$*), as well as between POD (day 0-7) and POCD on postoperative day 7 ($p=0.015$) and 90 ($p=0.016$), respectively (fig1). After adjusting for age, ASA physical status, MMSE, use of benzodiazepines preoperatively, duration and site of surgery as well as preoperative fasting, duration of delirium was an independent predictor for developing POCD on postoperative day 7 (1.189, 95% CI 1.04-1.36; $p=0.011$) and 90 (1.205, 95% CI 1.01-1.44; $p=0.041$); fig.2), respectively. Additionally, the severity of POD was found to be an independent predictor for POCD on postoperative day 7 (1.475, 95% CI 1.11-1.96; p=0,007) and 90 (1.792, 95% CI 1.14-2.81; $p=0.011$; fig 3).

Conclusion: Our results show that both duration and severity of delirium are independently associated with postoperative cognitive dysfunction.

References

1 Marcantonio ER, Simon SE, *et al.* (2003). “Delirium symptoms in post-acute care: prevalent, persistent, and associated with poor functional recovery.” *J Am Geriatr Soc* **51**(1): 4-9

2 Bickel H, Gradinger R, *et al.* (2008). "High risk of cognitive and functional decline after postoperative delirium. A three-year prospective study." *Dement Geriatr Cogn Disord* **26**(1): 26-31

3 McCusker J, Cole M, *et al.* (2002). "Delirium predicts 12-month mortality." *Arch Intern Med* **162**(4): 457-463

Paper No: 800.00

Tracheal intubation without muscle relaxants for elective surgery requiring general anesthesia: our experience

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Recent advances in drugs and acquisitions, and anesthesia equipment has led anesthesiologists to acquire and refine tecniques for tracheal intubation in patient safety and the practice of anesthesia.New opioids and short-acting hypnotic drugs have facilitated this process, where muscle relaxants are contraindicated or are not needed for surgical procedures or other.In this regard, in our unit of anesthesia we have adopted a tecnique for tracheal intubation without muscle relaxants, with the aim of teaching both medical personnel and paramedics, in addition to the standard techniques. Selected 120 patients belonging to ASA I-III and Mallampati class I or II, undergoing surgical procedures in general surgery, urology,orthopedics and ofthalmology were evaluated for tracheal intubation without muscle relaxants after

a careful preoperative anesthetic assessment. All patients monitored for vital signs and preoxygenated in the operating room and premedicated with atropine, ranitidine, dexamethasone and paracetamol i.v. After 2-3 minutes administration of sufentanil (0.15mcg/kg), the patient was encouraged to breath with oxygen spontaneously for about 7-8 minutes. Later, vital signs monitoring and administration of propofol in bolus (2.5mg/kg) and mask ventilation for about 30-60 seconds, followed by laryngoscopy and endotracheal intubation with aid of laryngoscope Mac Coy or glidescope. Evaluated Scheller intubation scoring criteria for various airway conditions and responses (mask ventilation, jaw mobility, exposure, cord position, movement and cough and with or without additional drugs given)and also were recorded values of Sato2, blood pressure and heart rate before induction, after induction and after intubation. To our experience excellent intubation conditions were obtained in 70% of patients and good intubation conditions in 25% of patients and inadequate conditions in 5% of patients.There were no significant haemodynamic alterations comparing to traditional techniques. We conclude that tracheal intubation is possible without muscle relaxants with the method described above as other methods published in literature. Tracheal intubation without muscle relaxants should not substitute standard tecniques and methods of intubation but can be a goog tool for patient safety and management of anesthesia practice where muscle relaxants are contraindicated or associated with undesirable side effects or not needed for certain surgical procedures and can included in the teaching methods for medical personnel and paramedics.

References

1 Mark S.Scheller, Mark H.Zornow Lawrence J.Saidman Tracheal intubation without the use of muscle relaxants: A tecnique using propofol and varying doses of alfentanil. *Anesth Analg* 1992; **75**: 788-93

2 Mangesh S.Gore, Kalapana D Harnagale evaluation of intubating conditions with varying doses of propofol without muscle relaxants Journal of Anaesthesiology Clinical Pharmacology 2011, **Vol 27**

3 Lundstorm Moller, Rosenstock, *et al.* Avoidance of neuromuscular blocking agents may increase the risk of difficult tracheal intubation:. . . British Journal of Anaesthesia **103** (2): 283-90 (2009)

4 Samar Taha, *et al.*. Propofol is superior to thiopental for intubation without muscle relaxants CAN J ANESTH 2005/**52**:3/p249-253

5 Woods A.W., Allam S. Tracheal intubation without the use of neuromuscular blocking agents. British Journal of Anaesthesia **94** (2): 150-8 (2009)

6 Linda Collins, James Prentice, *et al.* Tracheal intubation of outpatients with and without muscle relaxants. CAN J ANESTH 2000 / **47**:5 / p427-432

Paper No: 809.00

Safe working environment in imri ot (intra-operative magnetic resonance imaging operating theatre) – it must be achieved

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Introduction: The superiority of iMRI has led to safer, cost effective neurosurgery. Advantages include neuro-navigational accuracy by compensating for brain shift and intra-operative monitoring of extent of tumor excision. Our institution's iMRI OT incorporates a 1.5 Tesla MRI with a rotating surgical table (see photo). Despite safety protocols to ensure staff and patient safety within the hostile MRI environment, incidents still occurred.

Objectives: Documenting incidents, especially safety breaches in iMRI OT and learning from these.

Methods: After IRB approval, this prospective non-anonymous observational study was started in February 2009 till April 2010. Neuroanaesthetists in iMRI OT recorded any incident that happened or could potentially result in adverse outcome relating to safety and functioning of iMRI OT. Patient / anaesthetic details, event description and consequences were documented for subsequent analysis and follow up. The data was analyzed using Microsoft Excel spreadsheet.

Results: 166 iMRI OT cases were done in study period. 35 incidents were reported. 14 incidents (40%) resulted from human errors and were avoidable.

Equipment problems Number Anaesthetic monitors and machine malfunction e.g. non invasive blood pressure, temperature probe, pulse oximetry probe 9 MRI scanner (unable to load films, MRI computer system failure) problems 4 Operating table (trolley hit 'door open' button during MRI scanning, unable to adjust table height), operating microscope malfunctioning 4.

Equipment errors resulted in 7 instances of delayed or cancelled operations and 1 operation was transferred to a conventional theatre.

Human errors Number Failure to complete checklist resulting in:

- RFID tag (patient identity) brought into iMRI OT 5
- Undetected auditory implant 1

  Safety pin attached to nasal airway, metal strip on facemask brought into iMRI OT 1
  Safety checklist not done 1
- Cortical stimulation wire and nerve stimulator not removed 1 Handphone brought in by staff 1 New staff assigned without prior training 2 Others e.g. syringe pump wrongly programmed 2

These errors were picked up on time, with patients unharmed.

Patient Factors Number Severe hypotension 2 Cardiac arrest 1 Further patient workup required 1

These incidents were unavoidable and operations cancelled.

Conclusions: Ongoing incident-reporting helps with quality control. Majority of the unsafe incidents resulted from lack

of oversight. The inconvenience due to equipment errors can be minimized with more stringent checks / maintenance. No incident, however minor is tolerated in the hostile iMRI environment. Our institution strives for zero-tolerance through training and utmost vigilance.

References

1 The anaesthetist's role in the setting up of an intraoperative MR imaging facility. Tan TK, *Goh J Singapore Med J* 2009; **50**(1): 4

2 Anesthesia During High-field Intraoperative Magnetic Resonance Imaging Experience with 80 consecutive cases. *Bernd Schmitz Journal of neurosurgical anesthesiology* **Vol 15**. No. 3; ppp. 255-262

3 Intraoperative magnetic resonance imaging during transsphenio-dal surgery. Fahlbusch R, Ganslandt O, Buchfelder M, *et al. J Neurosurg.* 2001; **95**(3): 381-90

4 Quantification of, visualization of, and compensation for brain shift using intraoperative magnetic resonance imaging. Nimsky C, Ganslandt O, Cerny S, *et al. Neurosurgery.* 2000; **47**(5): 1079-80

Paper No: 822.00

Bilateral pneumothoraces and thyroid storm in undiagnosed 'graves' disease following posterior fusion scoliosis repair

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Introduction: Association of Graves'disease and scoliosis is rare. Bilateral pneumothoraces is a rare complication of posterior approach scoliosis repair. Thyroid storm is a life-threatening complication of untreated or partially treated Graves'. It rarely occurs as the first presentation of Graves'. Stress is a known precipitant.

Objectives and Methods: Case report documenting occurrence of bilateral pneumothoraces and thyroid storm in undiagnosed Graves' disease following scoliosis surgery. MEDLINE search using the words thyroid storm, Graves' disease bilateral pneumothoraces and scoliosis repair.

Results: A 14 year old girl with progressive idiopathic scoliosis underwent posterior spinal fusion with pedicle screws. At the end of surgery she developed bilateral tension pnuemothoraces, which were promptly drained. In the first 24 hours she also developed thyroid storm diagnosed clinically and biochemically.On the pre-operative anaesthetic assessment she had had a slight resting tachycardia with no thyroid symptoms and signs or cardiac pathology. She was treated successfully and discharged from the hospital.

Discussion: Pneumothorax, particularly bilateral pneumothorces, as a complication of posterior approach scoliosis repair with pedicle screws is very rare; only one case report was found in the literature. This patient's thin body habitus was probably a contributing factor. The combined stresses of surgery and tension pneumothoraces precipitated the thyroid storm in a patient with untreated Graves's disease. The resting tachycardia diagnosed on the preoperative anaesthetic examination was the only sign of hyperthyroidism, in an otherwise healthy patient. In light of the rare occurrence of Graves' disease in adolescents`(incidence 3/1000), it was reasonable to proceed with the surgery.

Conclusions: Bilateral pneumothoraces following posterior pedicle screw scoliosis repair though rare can occur. Chest X-rays should be done early in the post-operative period to avoid life threatening pneumothoraces. A resting tachycardia, even in the absence of thyroid symptomatology should prompt thorough evaluation of a cause in patients undergoing major electivesurgery.

References

1 Yuan Y-D, Lin C-C, Lin L-J (2007). Thyroid Storm Precipitated by Organophosphate Intoxication. *The American Journal of emergency Medicine* **25**861.pe1-861.e3

2 Viswanathan Ashwin. (2008). Pneumothorax complicating "in-out-in" pedicle screw placement for kyphotic deformity correction in a child. *Journal of Neurosurgical Pediatrics* **2**, p379-384

3 Aslan,Ivy R (2011). Respiratory Syncitial Virus Infection as a Precipitant of Thyroid Storm in a Previously Undiagnosed Case of Graves'Disease in a Prepubertal Girl. (J. Leger, Ed. International-Journal of Pediatric Endocrinology 2011 February 1-3

4 Burch H, Wartofsky L (1993). Life Threatening Thyrotoxicosis: Thyroid Storm. *Endocrinology and Metabolism Clinics of North America* **22** (2), p263-277

5 DeVoe JE, Judkins DZ (2007). What is the best approach to the evaluation of resting tachycardia for an adult? *The Journal of Family Practice* **65** (1), p59-61

6 Izumi K, Kondo S, Okada T (2009). A Case of Atypical Thyroid Storm with Hypoglycaemia and Lactic Acidosis. *Endocrine Journal* **56** (6), p747-752

7 Hicks John. (2010). Complications of Pedicle Screw Fixation in Scoliosis Surgery. *Spine* **35** (11), pE465-E470

Paper No: 834.00

Evidence-based perioperative drug therapy: getting evidence into policy & practice

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Background: Decision-making in the perioperative setting is high-stakes and fast-paced. Evidence synthesis needs to be "fit for purpose" and achievable at this pace of decision-making. For new drugs, uncertainty remains whether the added benefits outweigh the risks and costs. Unbiased evidence is needed to answer: Can it work? Does it work? Is it worth it? The Know4Go Framework closes the loop between evidence and appropriate action by making explicit in one place the benefit/risk, costs, SLEEPERs (social, legal, environmental, ethical, political, entrepreneurial,

research, and stickiness/ reversibility factors), and opportunity cost (4Go), to explicitly inform it should be a "go" or a "no-go" decision.
Objectives: This study is to create timely and contextualized evidence-based reviews for high-stakes perioperative drug therapies. It translates evidence to definitive decisions using the Know4Go Framework to make explicit the benefit/risk, cost, SLEEPERs, and forgone opportunities (4Go). Develop supporting tools, training, and capacity. Evaluate the clinical and economic impact. Methods: With institutional support, this program identified High Stakes Drugs for systematic review and/or meta-analysis based on likely clinical, economic, risk impact. Form multidisciplinary groups to collaborate in the evidence interpretation and synthesis. Identify the relevant clinical evidence for the four domains in the Know4Go Framework: 1) to contextualize the benefit/risk, calculate benefit index based on local patient characteristics and number likely to be helped or harmed (NNTB), 2) Contextualize the local cost implications, estimate local budget impact, 3) Perform SLEEPERs Assessment (radial plot), 4) Make the Informed Decision with the "decision ball" plot on the trade-off table (benefit index vs budget impact).
Results: Using Know4Go, we have advised on more than $6m worth of drug therapies at local institution (Table 1 and figure 1). It reversed the trend from rising drug costs in the 2 years pre- to a steep decline post-implementation. The projected savings due from Know4Go is $1.1 million Conclusions: Know4Go provided a transparent process for translating evidence to definitive clinical decision-making. It improved transparency, collaboration, knowledge translation, and reduced confusion between contrary evidence and opinions. Know4Go had an important local economic impact, saving 2-3-fold more dollars than it cost to fund the program.

Paper No: 842.00

Solution for in-flight emergency management

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Introduction: Medical professionals, travelers and personnel from aviation industry are focusing a lot of attention on medical emergencies that occur during flight. We must be aware regarding prevention of these emergencies as well as the knowledge of the facilities to deal with them. More than two billion passengers board commercial airplanes every year. Airline travel is safe and comfortable, but factors including psychological stress, jet lag, and preexisting disease cause a small number of passengers to become ill while flying. Figures for the incidence of significant in-flight emergencies are approximately 1 per 10– 40 000 passengers, with one death occurring per 3–5 million passengers1.
Objective: The objective of this paper is to find out the solutions for this problem.
Method: We have done a survey from Clinicians about solution of this problem. Clinician including anesthesiologists, surgeons, physicians, obstetricians, pediatricians & other specialists.
Results: After obtaining response from the doctors following solutions were recorded: Response Percentage of Acceptance Medical Training of Cabin Crew especially in Cardiac Emergency & Airway Management 100 Prevention of complications by pre-screening of patients 45 Medical kits & equipments with all emergency drugs for emergency management 75 On-line help centre like working in United States i.e. Medlink 55 Placement of Flight Nurses 45 Role of flight physician with extensive training in prehospital care and procedures that an emergency physician and an anesthesiologist have 80.
Discussion: The safest form of transport is said to be flying2. But as aircraft become larger and travel for longer without landing, it is obvious that medical problems will occur with increasing frequency. A survey by the UK Office for National Statistics found that the age group 45–54 years being the most likely to have travelled, so if more number of passengers are of increasing age the chances of medical emergencies will always be high1. In the past Persons who have not travelled because of age or poor health will now consider travelling. So this shift of passenger has greater implications in increasing the number of in-flight emergencies and deaths. The practice of recruiting nurses as flight crew is gaining success again as initiative taken by Dr Hirofumi Okoshi of Japan Airlines3. The aviation analyst Farrol Khan has even suggested that every airline should employ and carry in-flight doctors in response to the planned introduction of much larger aircraft such as the Airbus A3804.
Conclusion: As air travel continues to expand and life expectancy lengthens, in¬-flight medical emergencies are likely to increase. Provisions made by the airlines continue to improve in response to this demand and to changing medical technology and practices, but commercial, financial, and practical considerations have to be taken into account.

References

1 Cocks R, Liew M. Commercial aviation in-flight emergencies and the physician. *Emerg Med Australas*. 2007; **19**(1): 1-8
2 Expert Traveller (correspondent). The Observer 2006; 17 Sep. http://observer.guardian.co.uk/travel/story/0,1873980,00.html [Accessed 27 September 2006]
3 McGee C. Doctor calls for 'flying nurses'. *Inflight Asia* 2000; (Mar.: 4–5
4 Hamer M. Giant plane raises fear of medical emergencies. *New Scientist* 2005; (20 May): 8

Paper No: 876.00

No-cost TSE "MASK" prevents severe desaturation in elderly patients under deep propofol sedation during upper gi endoscopy

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Introduction: Patients undergoing upper GI endoscopy (EGD) routinely receive IV sedation and O2 via nasal cannula (NC). NC becomes ineffective in delivering O2 when the mouth is kept open by a bite-block. Deep sedation or airway obstruction may cause severe O2 desaturation, especially in elderly patients with cardiopulmonary diseases. A plastic sheet has been shown to improve oxygenation by transforming NC to a technically simple and effective face tent (TSE "Mask") in propofol-sedated patients during EGD in a prospective study (1).
Objectives: This technique has been used in the Endoscopy Suite. We examined its effectiveness in improving oxygenation and preventing severe desaturation in elderly patients during EGD.
Methods: Retrospective review of elderly patients (>70 years old) who underwent EGD, EUS, PEG or ERCP identified 2 groups. Group 1 (NC, n=13) received only NC O2. Group 2 (TM, n=51) received NC O2 and a TSE "Mask" using a clean clear plastic specimen bag to cover patient's eyes, nose and mouth(1-3). Patients received NC O2 (3-5 l/min or higher as needed) and only IV propofol. Student t-test and Chi Square test were used for analysis. A p value <0.05 was considered as significant. (Mean $\pm$ S.D).
Results: There were no differences in age (NC: 81 ± 6 years; TM: 79 ± 6), BMI (NC: 25.5 ± 5.8 kg/m2; TM: 26.0 ± 4.5), ASA Physical Status (NC: 2.6 ± 0.7; TM: 2.7 ± 0.7), room air (RA) O2 Sat (NC: $97 \pm 3\%$; TM: $97 \pm 2\%$), propofol dose (147 ± 65 mcg/kg/min; TM: 160 ± 61), duration (NC: 43 ± 22 min; TM: 41 ± 21) and the highest NC O2 flow (NC: 5.6 ± 2.7 l/min; TM: 4.9 ± 1.2). There were significant differences in FiO2 (NC: 0.25 ± 0.06; TM: 0.50 ± 0.12), O2 Sat after 5 min pre-oxygenation (NC: $99 \pm 1\%$; TM: $100 \pm 1\%$), the lowest O2 Sat (NC: $92 \pm 8\%$; TM: $97 \pm 4\%$), severe desaturation (O2 Sat $<85\%$) (NC: 4/13; TM: 1/51) and bag-mask ventilation (NC: 1/13; TM: 0/51). In 4 NC patients, NC was converted to TSE "Mask" due to severe desaturation (O2 Sat: $82 \pm 3\%$). Their O2 Sat was improved to $86 \pm 4\%$, $92 \pm 4\%$ and $96 \pm 3\%$ at 5 min intervals.
Discussion: These data show that pre-oxygenation with TSE "Mask" prior to deep propofol sedation for EGD improves oxygenation, prevents severe desaturation and reduces the need for assisted bag-mask ventilation in elderly patients. It increases O2 delivery without raising NC O2 flow. Conclusion: This face tent takes only a few seconds to prepare at no cost and may improve patient safety. It also reduces procedure interruptions and should be routinely used for pre-oxygenation prior to sedation during EGD.

References

1 Anesth 107:A922, 2007
2. Anesth 102:484, 2005
3. www.TSEMask.com

Paper No: 880.00

Is the lack of formal training in anaesthetic practice a factor in drug and communication errors?

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Introduction: Medical errors are a global health care issue. In anaesthesia drug errors and those relating to communication are among the top five patient safety problems reported. Specifically in anaesthetics mistakes may be more serious than those of doctors in other specialities.
Objectives: But how does training prepare the anaesthetist and work towards minimising this potential problem? We sought to find out if UK anaesthetic trainees were exposed to any form of training regarding how to minimise errors in anaesthetic practice. We choose to focus on medication errors encountered in everyday practice. We specifically looked at communication during handover, given that this relies on clear communication for transfer of complex information regarding patient care.
Method: We conducted a survey of all London anaesthetic trainees to establish what formal training they had received at any stage in their career. The survey was sent to encompass all anaesthetic trainees within the London Deanery.
Results: We found that 70% of trainees had received no formal training in drug preparation, safe administration of drugs, labelling or drug dilution. Amongst these trainees, 73% had already had a drug related error and 60% felt that they would have liked to receive training. With regards to communication, 100% of trainee had received no formal training on how to handover effectively. Notably, 50% of trainees have already encountered a serious incident relating to patient safety secondary to poor communication within their career. No departmental policy was in effect within 80% of anaesthetic departments and therefore 90% of handovers occurring without a minimum data set.
Conclusions: It is evident that errors in anaesthetic practice are frequent and are not being tackled by the current UK training practices. At present in the UK, the Royal College Of Anaesthetists training curriculum does not formally include a training module on standards of effective communication or the safe administration of drugs. We propose that

an effective solution would be to introduce a patient safety module into the UK training curriculum.

Paper No: 883.00

Esifoe, an anesthesia syndrome to be unveiled in buenos aires

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Introduction: Gastrointestinal endoscopy and patients' requests for general anesthesia have resulted in a new anesthesia syndrome: ESIFOE, Empty Stomach on Induction, Full stomach On Eduction.
Objectives: Establish ESIFOE as an anesthesia syndrome. Methods: Clinical observation and electronic literature review.
Results: This syndrome was first observed in two elective cases. The first was a hypertensive, 25 year old patient, who after an acute pancreatitis developed a large pancreatic pseudocyst. He insisted on general anesthesia for his procedure. The second case was a systemic lupus erythematosus, end-stage renal disease (ESRD), hypertensive patient, suffering from chronic pancreatitis, who developed a large pancreatic pseudocyst. This patient, too, demanded general anesthesia for her endoscopic procedure. Both patients received general endotracheal anesthesia with propofol for induction and a mixture of propofol and remifentanil for maintenance. The 25 year old patient was paralyzed with rocuronium and the ESRD patient with cisatracurium during induction and maintenance. The interventional procedures were ultrasound guided cyst gastrostomy with placement of double tail stents into the cyst cavity for both subjects. The gastroenterologists in both cases noted that a large amount of fluid entered the stomach from the pseudocyst cavitiy. Although the gastroenterologists emptied the stomach cavities as much as possible, in our first patient the fluid flowed freely from the stomach into the mouth even after the gastroscope had been withdrawn. The endotracheal tubes were only removed after the patients' paralysis had been completely reversed with neostigmine and glycopyrrolate, and the subjects were totally awake, thus assuring airway protection. Both patients had an uncomplicated postoperative period. A literature review through Google and Pubmed failed to encounter any description of this proposed syndrome.
Discussion: The risks of general anesthesia in patients with full stomachs are well known. In our elective, empty stomach cases, the risks appeared during eduction. The placement of draining stents –from the cystic cavity into the stomach– caused the stomach to continue filling even after the removal of the suctioning gastroscope. Thus, we were extubating patients whose stomachs were empty on induction but full at eduction, and so their airways had to be preserved. These important findings constitute a new group of related events, a syndrome, depicted by the acronym ESIFOE.
Conclusion: ESIFOE is a new anesthesia syndrome that involves: empty stomach on induction, full stomach on eduction. It will be unveiled in Buenos Aires.

Paper No: 885.00

Perioperative predictors of in-hospital mortality in patients undergoing aortic valve replacement

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Introduction: Aortic valve replacement (AVR) is the most common cardiac valve operation1-2. Nevertheless, evidence for predictors of mortality in AVR appears scant.
Objective: The study aim was to identify perioperative predictors of in-hospital mortality in patients undergoing AVR.
Methods: After obtaining approval from the Research and Ethics committee on the use of the perioperative database, we studied consecutive adult patients having undergone an AVR between January 2004 and May 2009. We collected demographic, hemodynamic, and other perioperative data until hospital discharge. The exclusion criteria were AVR combined to mitral valve surgery, Bentall or aortic surgery, Ross or Ross-Konno procedure, Homograft valve and tricuspid valve surgery. T-test and Chi-square or Fisher exact test were used to compare continuous and categorical variables to identify predictors of mortality with alpha=0.05.
Results: A total of 190 patients were included. The mean age was 71 ± 11 years old with 59% male. The in-hospital mortality rate was 7.9%. On univariable analysis, preoperative NYHA functional class (III - IV vs I - II, p=0.017), perioperative myocardial infarction (p=0.001), left ventricular (LV) systolic dysfunction (p<0.001), oliguric acute renal failure (p=0.012), need for reintubation (p=0.001) and sepsis (p=0.018) were associated with mortality. However, only preoperative congestive heart failure (CHF) (odds ratio [OR]: 0.085; 95% confidence interval [CI]: 0.012 - 0.611; p=0.014), perioperative LV systolic dysfunction (OR: 0.001; 95%CI: 0.005-0.235; p=0.001) and need for reintubation (OR: 0.117; 95%CI: 0.15-1.02; p=0.04) remained as independent predictors after multivariate analysis.
Conclusion: Preoperative CHF, perioperative LV systolic dysfunction, as well as the need to reinitiate mechanical ventilation appear as strong predictors of in-hospital mortality among patients undergoing AVR.

References

1 J Thorac Cardiovasc Surg 1999;117:273-84
2 Eur Heart J 2003;24:1231-1243

Paper No: 896.00

An Analysis of an Acute Pain Service Database

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Introduction: Pain is under-recognized and under treated. In the postoperative period up to 75% of patients have reported moderate to severe pain. It was often thought that even if pain was not good for the patient, at least it did no harm. It is now recognized that under treatment of severe acute pain can have a major harmful physiological and psychological effects on all organ systems. More recently, there have been significant improvements of acute pain. This is largely due to the introduction of new techniques for the delivery of analgesic drugs, such as patient-controlled analgesia and epidural analgesia, and the formation of an acute pain service team, involving a dedicated team of health care providers. A database for the acute pain service of Hamilton Health Sciences was created in 2002, which cares for patients in 3 locations viz. Hamilton General, Henderson, and McMaster University Medical Center. At present there are 26 000 patients entered into the database, with 8216 enrolled at McMaster. For the purpose of this audit, I will only review the McMaster data. The Acute Pain Service team, on a daily basis at McMaster, comprises of 1 Pain Nurses and an anesthesiologist. They visit each patient enrolled into the pain service daily, and make suggestions regarding pain management. In addition, information is collected and entered into the database by the pain nurse. There are 143 variables in the database, including demographic data, type of pain therapy, adequacy of analgesia and side effects.
Research Questions: A priori questions were:

(1) Pain scores at rest and with activity
(2) Complication rates
(3) What are the predictors for uncontrolled pain?
(4) What are the risk factors for critical incidents?
(5) What are the predictors for side effects?

Statistical Analysis: Analysis was conducted using SPSS 16.0.
Results: 7713 patients were included for analysis. The main pain modality was PCA 70% and epidurals in 29%. The mean pain score (VAS 10) was 1.3 at rest and 3.0 with activity. Incidence of side effects was 26.9% with nausea, vomiting and pruritis comprising the largest percentage. Factors predicting 'uncontrolled' pain include ASA 1 and 2, surgery of the thorax, upper abdomen, spine surgery and patients on PCA. Factors influencing critical incidents include emergency surgery, and ASA 1 and 2 patients.
Conclusion: This is a comprehensive database with information collected prospectively and large numbers of patients enrolled. Predictive factors elucidated, have influenced the management of patients by the Acute Pain Service and encouraged education sessions with the ward nursing staff at McMaster University Medical Center.

Paper No: 899.00

Predicting central venous catheter tip position in adults, a pilot study

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Introduction: The ideal catheter tip position is at the superior vena cava (SVC) and the right atrial (RA) junction. [1,2,3] Recent audit and publications suggest the right internal jugular as the commonest site for insertion of CVCs. [3] As per the surface anatomy, the sternal angle lies at the lower border of T4 and on the CXR corresponds to the carina. [4]
Methods: that allow to pre-determine correct length of CVC insertion either require pre-insertion CXR to be present or use technology that adds to the cost and time. [5,6]
Objectives: Can the distance from the insertion point to the sternal angle correctly predict the catheter tip position? Methods: 110 patients consented for CVC insertions were studied. In the post-op period, a paper scale was used to measure the length of insertion (I) and the distance from the point of insertion to the sternal angle (M). Chest X-Ray was then reviewed to assess the catheter tip position. Catheter tip was considered to be satisfactory if it was situated at or above 2 cms of the carina. Tip of the catheter beyond or>2 cms above the carina was considered to be unsatisfactory. If M=I, then as per our hypothesis, the catheter would be in the correct position (zone B). If M>I, then the catheter would lie in the upper part of superior vena cava and if M<I, the catheter would lie in the RA. Results: Of the 110 cases, 3 were excluded and hence 107 cases included in this pilot study. Of the 107 cases, 61.68% were in Zone B (satisfactory position, M= I) and 38.32% were found to in unsatisfactory position (12.15% in upper 1/3rd of SVC, M>I and 26.17% below the carina or in the RA, M< I). For the catheter tips placed in the correct zone, given the 2cm tolerance, measured distance agreed with the inserted length for all 66 correct placements in the 107 cases, (100% correlation). The method also correctly predicted the 41 catheters that were inserted too far or too short. The 100% agreements with 'correct' insertion zone placement and disagreeing (correctly) with the 'incorrect' insertion zone placements indicates that the method is reliable.
Conclusions: Our pilot study proves that it is possible to place right sided central venous catheters in the correct position using our simple method.

References

1 Sivasubramaniam S, Hiremath M (2008). Central venous catheters: Do we need to review practice on positioning? *JICS* **9**(3), p228-231

2 Flectcher S, Bodenham A (2000). Safe placement of central venous catheters: where should the tip of the catheter lie? Editorial II, *British Journal of Anaesthesia* **85**(2), p188-191
3 Schuster M, Nave H, Piepenbrock S, Pabst R, Panning B (2000) The carina as a landmark in central venous catheter placement. *Br J Anaesth* **85**: 192–4
4 Lumley JSP Anterior thorax, heart and great vessels, In: Surface anatomy, the anatomical basis of clinical examination. 4th Edn). *Churchill Livingston Elsevier* 2008, p32-35
5 Lee JH, Bahk JH, Ryu HG, Jung CW, Jeon Y (2009) Comparison of the bedside central venous catheter placement techniques: landmark vs electrocardiogram guidance. *Br J Anaesth*.; **102**(5): 662-6
6 Madan, M, Shah, M, Alexander, D, Taylor, C,, McMahon, M (1994) Right atrial electrocardiography a technique for the placement of central venous catheters for chemotherapy or intravenous nutrition. *British Journal of Surgery* **81**, p1604-1605

Paper No: 902.00

Retention of intubation skills by novices

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Introduction: Many clinicians called upon to perform emergency tracheal intubation have not intubated for weeks, months or even years following their training.
Objective: To assess and compare the retention of intubation skills by novices.
Methods: After obtaining REB approval, 30 novice first year medical students were recruited and randomized to either Macintosh (MAC) or McGrath (MCG) groups. Each participant received a standardized instructional video with no verbal feedback before performing twenty consecutive intubations on CPR manikins. All intubation attempts were videotaped. Participants returned after six months to perform another twenty consecutive intubations on the same manikin, this time with no access to the instructional video. All videotaped intubation attempts were shuffled and then randomly reviewed by an independent anesthesiologist. A "successful attempt" is defined as a tracheal intubation achieved in less than 60 seconds and considered acceptable by the reviewer. Success rates for MAC and MCG larygnoscopes were compared before and after the six-month hiatus.
Results: Demographics of the participants were similar in both study groups. Five participants were excluded from the retention part of the study for having some airway experience in the intervening six months. Preliminary data analysis reveals no statistical difference between the learning curves for MAC or MCG laryngoscopes, nor the retention curves for MAC and MCG laryngoscopes. In the MAC group, despite previously obtaining a greater than 90% success rate after 20 performances, the first attempt at intubating after a six month hiatus was not statistically more successful than the time they first held a laryngoscope. In contrast, the MCG group appeared to retain some proficiency.
Discussion: Preliminary results show that retention of intubation skill is poor. Despite achieving high success rates six months prior, performance was so bad that the reviewer did not feel comfortable for vast majority of novice MAC or MCG users to intubate her even in an emergency. Interestingly, the retention groups required more attempts at intubation to achieve proficiency than the learning groups, when the only difference between the two scenarios was the allowance of an instructional video for the learning group.
Conclusion: This study questions whether novices who have previously obtained proficiency in intubation should be called upon to intubate in any clinical scenario if they are not receiving ongoing experience or education.

Paper No: 903.00

State of patient's hydration before elective surgeries in general anesthesia (correlation of guidelines and clinical practice)

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Introduction: Good hydration state has a positive influence on hemodynamic stability 1 and thus on the course of general anesthesia. Positive effect of hydration on cognitive function in postoperative course is proven 2. This is important mainly with seniors. Hydration has hereby direct influence on patient's safety during hospitalization. Last intake of 200ml of clear fluid is recommended 2 hours before anesthesia 3,4,5. These recommendations have been incorporated into the Masaryk Hospital guidelines in recent years. Medical staff has been instructed on these guidelines repeatedly.
Objectives: To perform investigation in the Masaryk Hospital clinical practice in order to map hydration state of the patients undergoing elective surgeries in general anesthesia. To identify deviations from the guidelines and analyze their causes.
Methods: On weekdays in a randomly chosen week (in winter 2010) all adult patients undergoing general anesthesia (n=192) due to elective surgical procedure were asked: 1) whether they had been educated, 2) when they drank for the last time and 3) whether they were thirsty. Time of the questioning was recorded to determine the interval of oral hydration restriction and correlate it with thirst signaling insufficient hydration. None of the patients had any health problem preventing him from following given recommendation.
Results: Recorded interval of hydration restriction in 192 respondents (90 men and 102 women) was in the range 2 – 18 hours (less than 6 hours 23%, 6 – 12hours 41%, more than 12 hours 36%). Instruction on drinking regime had

received 174 patients, only 18 had not. Approximately two thirds of the patients reported thirst. The sense of thirst increased with the length of fluid restriction and was more distinct with patients older than 70 years old.

Conclusions: The results have shown that significant proportion of the patients is not in a satisfactory hydration condition before elective surgery even though they are formally well educated and the medical staff has apparent knowledge of the issue.

Individual cases were analyzed and most frequent causes were found. They are primarily bad time management when the planned time of the surgery is changed with no influence on a hydration management. Patients often choose from the mixed information they get e.g. from the family, general practitioner, in the hospital the one he or she prefers (he doesńt drink because of fear of wetting himself…) and doesńt discuss the problem any further.

Our findings are challenge to improve hydration care in the Masaryk Hospital (we have reinforced our inspectiton acitivities in the year 2011). They also might inspire other medical institutions to perform their own investigations in this field.

References

1 Lu CC, Diedrich A, Tung CS, Paranjape SY, *et al.* Water Ingestion as Prophylaxis AgainstSyncope Circulation 2003, **108**: 2660–2665

2 Wilson MMG, Morley JE Impaired cognitive function and mental performance in mild Dehydratation European Journal of Clinical Nutrition 2003, **57** (suppl. 2): 24–29

3 Guidelines to the Practice of Anesthesia Revise Edition 2011 Canadian Journal of Anesthesia, 2011, **58** (1): 74–07

4 Maltby JR : Pre – operative Fasting Guidelines Update in Anaesthesia [Internet] 2000,[cited 2011 September 01] 12 (2): 1-2 Available from: htpp://www.nda.ox.ac.uk/wfsa/html/u12/ul1202_01.htm Practice Guidelines for Preoperative Fasting and the Use of Pharmacologic Agents to Reduce the Risk of Pulmonary Aspiration: Application to Healthy Patiens Undergoing Elective Procedures Anestesiology, 2011, **114** (3): 495–511

Paper No: 953.00

A study to determine whether carbon polymer warming blankets can reduce the incidence of inadvertent peri-operative hypothermia (iph) during day-case surgery

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Introduction: The prevention of inadvertent perioperative hypothermia (IPH) has recently become acknowledged as an important means of improving patient care and clinical outcome (1).

Studies have shown that the forced-air warming is an effective means of preventing IPH during major surgery (2). However, they are single use and therefore can be costly in both environmental and financial terms.

Recent advances in medical technology have led to the development of novel patient-warming devices, such as electric carbon polymer blankets. Small studies suggest that they possess similar effectiveness to forced-air warming and with the added advantage that they are non-disposable and potentially cheaper.

Objectives: The primary aim of this study was to assess the effectiveness of the HotDog patient warming system, a carbon polymer warming blanket, in reducing IPH in Daycase surgical patients.

Methods: This study was a prospective, randomized, controlled trial. The study was powered to show a 50% reduction in the incidence of IPH requiring 35 patients in each arm. It was an observational study and was conducted in a single institution. Each participant gave written consent pre-operatively. In the intervention arm, the warming blanket was applied on entry to the operating-room and removed at the end of the operation. The control arm received standard treatment for these procedures (no active warming).

Results: We present an interim analysis of 40 patients: 20 in the intervention arm and 20 controls. The average operating time was 37 minutes. 93% of participants were normothermic pre-induction and all patients had a temperature $\geq$36 degC post-induction (3). 50% of patients were randomly allocated to the HotDog group. At knife to skin 5% HotDog and 9% non-intervention were hypothermic. At the end of the operation only 10% of patients in the intervention group were hypothermic and 22.5% in the non-intervention group. 23% of these remained hypothermic until discharge from PACU i.e. 7.5% of all patients in the trial. Unexpectedly, of the patients discharged from PACU hypothermic (lowest 35.6degC) 80% were in the HotDog intervention group.

Conclusions: There is a significant incidence of IPH among patients undergoing short surgical procedures. The HotDog carbon polymer blanket appears to be effective at reducing its incidence intraoperatively but, paradoxically, its use seems to increase its incidence in the PACU. We would therefore recommend that patients undergoing short operations are warmed not just intraoperatively but through into the PACU until discharge to the ward.

References

1 Sessler DI. Perioperative Heat Balance. *Anesthesiology* 2000; **92**: 578-96

2 Galvao CM. Effectivemness of Cutaneous Warming Systems on Temperature Control: Metanalysis. *J Adv Nurs* 2010: **66**(6): 1196-1206

3 National Institute for Health and Clinical Excellence (NICE). Clinical guidelines CG65

Paper No: 957.00

Postoperative Bladder Catheterization after General Surgery: Which Anesthesia Technique is Better, Spinal or General Anesthesia?

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Introduction: It is believed that postoperative bladder catheterization after spinal anesthesia is more common than after general anesthesia. There is no literature supporting this 'feeling' among anesthesiologist. We performed a study comparing the incidence of postoperative bladder catheterization after general and spinal anesthesia in general surgical patients.
Objective: To determine the difference in incidence of postoperative bladder catheterization after spinal or general anesthesia in general surgical patients in which both anesthesia techniques could be used. The threshold for bladder catheterization was set at a fixed bladder volume of 500 ml.
Methods: Observational controlled trial conducted in 909 surgical patients in a teaching hospital in the Netherlands. Patients were operated under general or spinal anesthesia without an indwelling urinary catheter. The decision which anesthesia technique was used (spinal or general anesthesia) was made by the patient at the preanesthesia assessment clinic. All postoperative bladder volumes were measured by ultrasound. Postoperative bladder catheterization happened when the bladder volume measurement exceeded the threshold of 500 ml and spontaneous voiding was impossible. The primary endpoint was the incidence of postoperative bladder catheterization. Secondary endpoints were the influence of gender and type of surgery.
Results: The overall incidence of catheterization was 11.8% (107/909 patients). The incidence of catheterization after spinal anesthesia was 24.4% (70/287) and after general anesthesia 5.9% (37/622). The incidence in male patients was 14.4% (56/401) and in female patients was 9.6% (49/508). The incidence of catheterization was the highest after hernial groin repair under spinal anesthesia (55% (15/27)).
Conclusion: The chance to be catheterized after spinal anesthesia is about 4 times higher than after general anesthesia. Male patients are more often catheterized than female patients. The highest risk for postoperative bladder catheterization is after hernial groin repair surgery in male patients under spinal anesthesia. Anesthesiologists may use this result in deciding which anesthesia technique to choose for if both anesthesia techniques – general or spinal - are applicable.

Paper No: 966.00

Intraoperative oesophageal doppler during emergency abdominal surgery

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Introduction: Most of the classical devices of monitoring for diagnosis and assessment of hypovolemia, as the Swan-Ganz catheter or central venous catheter are bloody, nonexempt of complications and, in some cases, of questioned benefit. Occult hypovolemia leading to poor organ perfusion is thought to be a major factor in determining postoperative morbidity after major surgery. Hypovolemia will be even more severe in most emergency cases, so intravenous fluid resuscitation is a vital part of care for the sick laparotomy patient. Minimally invasive devices have been emerging over the past few years as an effective alternative to classic monitoring tools. The best characterized in terms of outcome studies is oesophageal Doppler flowmetry.
Objective: To assess the efficacy of the oesophageal Doppler in the decrease of perioperative complications in patients undergoing emergency abdominal surgery.
Methods: A total of 250 patients undergoing emergency abdominal surgery were recruited into a blind prospective randomized controlled trial. Patients were allocated to conventional haemodynamic management or to an algorithm guided by oesophageal Doppler. The control group received perioperative fluid at the discretion of the anaesthetist, whereas the protocol group received additional solutions boluses based on Doppler assessment.
Results: Groups were similar with respect to demographics, surgical procedures, and baseline hemodynamic variables. Patients in the protocol group were given a significantly greater volume of intravenous crystalloid than control group (mean 2657 vs 1944 ml, P=0.00, Mann–Whitney U-test). The complications in protocol/control groups respectively were: Cardiovascular (32/61, p =0,00 Chi- square), respiratory (36/58, p =004 Chi-square), infection of injury (4/15, p =0,009 Chi-square) and renal insufficiency (8/21, p= 0,01 Chi-square). Duration of hospital stay in the protocol group was 8.18 days vs 10.88 days for control group (p=0,00 Mann-Whitney U Test). Duration of intensive care unit stay in the protocol group was 1.12 days vs 1.69 days for control group (p=0,00 Mann-Whitney U Test).
Discussion: Several studies have shown that accurate prediction of hemodynamic status by clinical assessment alone only occurs in half the cases. Blood pressure and heart rate may thus underestimate fluid requeriments during anesthesia. Patients in the protocol group were given a greater volume of i.v. crystalloid solution using oesophageal Doppler.

Conclusion: For patients undergoing emergency abdominal surgery the intraoperative oesophageal Doppler monitoring leads to a shorter hospital and intensive care unit stay and decreased major postoperative complications.

References

1 Patrick Schober, Stephan MD, Loer A, Lothar A, Schwarte. Perioperative Hemodynamic Monitoring with Transesophageal Doppler Technology. *Anesth Analg* 2009; **109**: 340–53

2 Abbas SM, Hill AG. Systematic review of the literature for the use of oesophageal Doppler monitor for fluid replacement in major abdominal surgery. *Anaesthesia* 2008; **63**: 44–51

3 Noblett SE, Snowden CP, Shenton BK, Horgan AF. Randomized clinical trial assessing the effect of Doppler-optimized fluid management on outcome after elective colorectal resection. *Br J Surg* 2006; **93**: 1069–76

Paper No: 978.00

Preoperative testing for minimal risk patients undergoing elective surgery was inconsistent with the institution guideline

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Introduction: Few preanesthetic investigation are considered necessary for no underlying disease patients (ASA I) undergoing elective surgery. The institutional guideline for testing has been established to facilitate appropriate requests and to minimize the costs.
Objectives: The primary objective of this study was to determine compliance of preoperative investigation guideline for ASA I patients undergoing elective surgery. Secondary objectives included: to identify common inappropriate investigations among age groups and to estimate unnecessary expenditure.
Methods: All ASA I patients, aged 18-65 underwent elective surgery over a one year period (June 2010- May 2011) were identified. One hundred and twenty five medical records of each month were randomly selected. Indicated tests were recommended according to patients' age groups: a complete blood count (CBC) for aged 18-45, a CBC, chest radiograph, electrocardiography for aged 46-60, and a CBC, chest radiograph, electrocardiography, electrolytes, blood glucose, blood urea nitrogen (BUN) and creatinine (Cr) for aged 61-65. Compliance laboratory test was defined as the laboratory testing followed the institutional guideline whereas non-compliance laboratory testing was classified for either over- or under-investigations.
Results: The medical records of 1,496 patients underwent elective orthopedics, gynecology, eye, ear nose throat and general surgery were reviewed. There were 948 (63.4%) patients aged 18-45, 499 (33.4%) patients aged 46-60 and 49 (3.2%) patients aged 61-65. Complied preoperative testing was performed only 12.1% (95% CI, 10.5- 13.9). Over-investigations tended to be performed in younger patients. BUN and Cr were the two most commons over-investigation (n=975), followed by electrolytes (n=893) and chest radiograph (n=759). Under-investigations could not alter surgical schedules in the study patients. Overall, over-investigation preoperative investigation accounted for about 18,000$ during the study period.
Discussion: Preoperative testing for ASA I patients is rarely important. Normal results did not affect neither perioperative morbidity nor mortality. In contrast, abnormal test which may detect in 5% of healthy patients may cause psychological and financial burden and unnecessary rescheduling of surgery. Many preoperative guidelines recommend few tests in this group of patient. However, non-compliance tests have been reported in many studies. Our report was also demonstrated over-investigations were very common. There was only 12.1% followed the institution guideline. The situation caused huge unnecessary expenditure.
Conclusion: The utilization of the preoperative guideline should be more emphasized in order to decrease unnecessary tests and financial burden.

Paper No: 979.00

Retrograde topicalization of the supraglottis by translaryngeal injection of lidocaine timed with forceful exhalation

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Introduction: The primary requirement for successful awake fibreoptic intubation is the effective topicalization of the airway.1 In cases of supraglottic tumours which impede local anaesthetic from reaching the larynx, adequate airway topicalization cannot be achieved.
Objectives: We present a case of a patient with a large supraglottic carcinoma which obstructed the glottic opening, thus preventing topicalization from above the vocal cords. We describe a novel technique to topicalize the supraglottic area by retrograde injection of local anaesthetic through a translaryngeal catheter, timed with the patient's forceful exhalation.
Methods: A 72-year-old female with a supraglottic carcinoma presented for tumour debulking. She had a 6-month history of progressive hoarseness and dysphagia. CT scan showed a large exophytic right supraglottic mass measuring 2.6 x 3.2 x 2.8 cm. This extensive tumour involved the right aryepiglottic fold, extended across the midline, and invaded the laryngeal surface of the epiglottis. In preparation for awake orotracheal

fibreoptic intubation, topicalization was performed by spraying the oral, pharyngeal and laryngeal mucosae with nebulized 4% lidocaine, followed by the "spray- as- you- go" technique through the bronchoscope. Because the supraglottic mass impeded access to the glottic area, adequate intubating conditions could not be obtained. Furthermore, as both cornua of the hyoid bones were invaded by tumour, bilateral superior laryngeal nerve blocks2 could not be performed. A 20 gauge angiocatheter connected to a 5 ml syringe filled with 4% lidocaine was inserted through the cricothyroid membrane and its intraluminal position confirmed by aspiration of air.3 To achieve anaesthesia below the glottis, the catheter was directed away from the vocal cords and 3 ml of lidocaine were injected at end of exhalation. To achieve retrograde topicalization of the supraglottis, the catheter was then redirected towards the vocal cords. Injection of 4 ml of lidocaine was timed with the patient's forceful exhalation to entrain lidocaine upwards across the vocal cords to the supraglottic area.
Results: This retrograde flow of lidocaine across the vocal cords was reminiscent of a geyser's eruption, spraying lidocaine from below to reach the supraglottic area. After waiting 5 minutes for the local anaesthetic to take effect, adequate topicalization was achieved and optimal intubation conditions allowed successful intubation. Surgery proceeded uneventfully. The patient was discharged home the following day in good condition.
Conclusions: This relatively simple technique for airway topicalization transformed an impossible awake intubation into a successful one and spared the patient the need for an awake tracheostomy.

References

1 Mongan PD, Culling RD. Rapid oral anesthesia for awake intubation. *J Clin Anesth* 1992; **4**: 101-5
2 Gotta AW, Sullivan CA. Anaesthesia of the upper airway using topical anaesthetic and superior laryngeal nerve block. *Br J Anaesth* 1981; **53**: 1055-8
3 Gold MI, Buechel DR. Translaryngeal anesthesia: a review. *Anesthesiology* 1959; **20**: 181-5

Paper No: 1008.0

A risky complication of monitored anesthesia care

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Introduction: Conscious sedation under monitored anesthesia care is used over a wide range of operations. However, the most common side effects include respiratory depression and apnea.1) Recently, we experienced tracheal aspiration of a small surgical sponge under conscious sedation using the total intravenous anesthesia(TIVA) technique.
Objectives & Methods: A 68 year old woman was admitted for surgery to address nasolacrimal duct obstruction. We infused propofol and remifentanil through Orchestra TM. Her BIS values were maintained around 80. She breathed spontaneously and responded properly. After 30 minutes. She intermittently stopped snore, and took a slow deep breath. 45minutes later, she suddenly became apneic despite of our stimuli. Even though we lifted her chin, her saturation decreased to 75% after one deep breath and her BIS value fell to 60. Operation was discontinued, started mask ventilation with 100% O2. Her saturation increased rapidly to 95%, and the BIS value returned 80. Intubation was performed because the patient was unresponsive. A lost sponge was noticed, but it might be swallowed rather than aspirated because of maintaining stable vital signs and 100% oxygen saturation.
Results: At the end the operation, we evaluated the chest X-ray, Finally we found that the radio-opaque thread dangling from the sponge was placed in the midline of the trachea. Since she had already extubated, removal of foreign material by fiberoptic bronchoscopy was planned. As soon as the patient started to inhale the cold nebulized drug, she coughed violently and the sponge emerged.
Conclusion: Choice of anesthetic agents does not appear to be significant.2) Anesthesiologists need attention to maintaining adequate sedation levels to prevent adverse events. Also, surgeons need to ensure the surgical materials cautiously.

References

1 General dentistry 2010; 58: e20-5
2 Digestive diseases and sciences 2010; 55: 2537-44

Paper No: 1039.0

Perianaesthetic dental injury in children - Beware the unknown

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Introduction: Current literature emphasises dental injury associated with anaesthesia in the adult population. There is a paucity of literature in the paediatric population. Dental injury is one of the most common adverse events and serious morbidity can result from aspiration of an avulsed tooth. This risk is increased in the paediatric population with a high incidence of loose and easily dislodged primary teeth.

Objectives: To study the incidence, outcomes and risk factors for perianaesthetic dental injury following 80,811 anaesthetics from 2000 to June 2011. A review of the effectiveness of existing measures will allow recommendations, to prevent this recurrent problem, to be made.
Methods: A retrospective search of our departmental audit database for incidents of dental injury was conducted. Analysis of the adverse events from case notes and audit forms filled by anaesthetists at the time of care was done.
Results: Our Incidence of dental injury is 42 out of 80,811 anaesthetics (0.05%).64% of patients with dental injury were intubated and 92% had a Grade 1 larynx. In 24 patients with a negative or inaccurate dental history, 6 patients required radiographs to detect missing avulsed teeth not found clinically. Of these 6, ingestion of teeth occurred in 2. In a patient, the avulsed tooth was only noted when he coughed it out upon emergence. Of the 12 patients with subluxed or luxated teeth, 5 were detected in recovery. Of these 5 patients, 1 required reimplantation of his permanent tooth and another required tooth removal. In 16 patients with an accurate dental history, all 12 with subluxations or luxations were detected intraoperatively. In 2 patients, the missing teeth were found at the end of surgery and removed. 2 patients required radiographs of which ingestion of the tooth was found in 1.
Conclusion: Our Incidence of dental injury of 0.05 % is comparable to that in adults. In our pilot survey of 239 children aged 5 to 12 years, the incidence of loose teeth or gaps is 28%. Our current measures of having a dental diagram in the anaesthetic chart, multiple levels of dental screening and education have contributed to the incidence. Our recommendations include precise identification of loose teeth and gaps, examination of dentition and better communication. Early knowledge of a missing tooth will minimise aspiration risks, irradiation and patient anxiety. It is imperative that we are aware of the perils that lurk.

Paper No: 1049.0

Anaesthetic emergencies preparedness in a paediatric anaesthetic department

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Introduction: Anaesthetic emergencies constitute a small but significant cause of morbidity and mortality in the paediatric population. In order to achieve successful outcome in these challenging situations, a coordinated team response with appropriate knowledge, including location of emergency drugs and equipments, and skills are essential.
Objectives: This study aims to assess the preparedness for anaesthetic emergencies in a paediatric anaesthetic department in a teaching hospital, in two main areas:

(1) To identify the immediate availability of the relevant emergency drugs and equipment in all areas where paediatric anaesthesia is delivered
(2) To assess the awareness and knowledge of staff on the relevant emergency drugs and equipment, and their location

Methods: The study examined the preparedness of five anaesthetic emergency situations: -Malignant hyperpyrexia crisis (MH)-Anaphylaxis-Difficult airway-Severe local anaesthetic toxicity-Paediatric cardiac arrest
It was performed in two parallel parts:

(1) Using a proforma, the author visited each paediatric anaesthetic area and directly assessed the availability of relevant emergency drugs and equipment
(2) The author conducted face-to-face interview with anaesthetic and nursing staff using a pre-written questionnaire

Results: Paediatric anaesthesia, both elective and non-elective, is provided in 6 locations, including 3 isolated locations at the endoscopy suite, dental outpatient department and magnetic resonance imaging suite. In all locations, there were provision of emergency drugs and equipment for anaphylaxis and cardiac arrest. However, only 2 locations had dedicated paediatric cardiac arrest trolley. Treatment for MH is immediately available in 4 locations and only 2 locations stocked Intralipid 20% for severe local anaesthetic toxicity. Difficult airway equipment is available in 3 locations. The author interviewed 25 staff, including 6 consultant paediatric anaesthetists, 7 paediatric anaesthetic trainees, 4 theatre nursing staff and 8 operating department practitioners (OPDs). Majority of anaesthetic trainees (60–80%) did not know the location of the relevant emergency drugs and equipment. None of the nursing staff was aware of the immediate management of MH. Consultant paediatric anaesthetists and ODPs are most knowledgeable about the location of emergency drugs and equipment (67-100%).
Conclusions: This study reiterates that anaesthesia is provided in the diverse and often disparate environments. It identifies important areas for improvement, in particular the involvement of theatre nursing staff as part of the team in anaesthetic emergencies. Multidisciplinary simulation training in anaesthetic emergencies may be beneficial for better patient safety.

References

1 Guidelines for the provision of anaesthetic services. RCOA London 2009
2 J Leedham, S Patel. Anaesthetic emergencies – drugs and equipment preparedness. Raising the Standard: a compendium of audit recipes. RCOA London 2010. (http://www.rcoa.ac.uk/docs/arb-new-emergencies.pdf)

Paper No: 1050.0

Evaluation of trans-dermal nicotine patch for attenuation of venous cannulation pain

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Introduction: Venous cannulation pain, the first painful experience by the patient in operation room is often discomforting and stressful for both patients and health care professionals. Various pharmacological and non-pharmacological measures have been tried to minimize venous cannulation pain with variable success.
Objective: The present study was planned to evaluate the efficacy of trans-dermal nicotine patch for attenuating venous cannulation pain.
Methods: Sixty adults (16–60 yrs), ASA physical status I and II, of either sex, undergoing laparoscopic cholecystectomy, were included in this prospective, randomized, double blind and placebo controlled clinical study. Patients were divided into 2 groups of 30 each. Control group: received placebo patch; Nicotine group: received trans-dermal nicotine patch. The patches were applied at the proposed venous cannulation site 1 hr prior to cannulation with 20 G IV cannula; venous cannulation pain was assessed on a visual analogue scale (VAS) of 0–100 mm (0=no pain, 100=worst possible pain). Data were analyzed using student's T test, chi square test, Mann Whitney U test and Fisher's exact test. $P<0.05$ was considered significant.
Results: The incidence of venous cannulation pain in the nicotine group (63%) was significantly lower as compared to the control group (100%; $P<0.01$). Severity of venous cannulation pain [median VAS (inter-quartile range)] was also significantly reduced in the nicotine group 20 (30) as compared to the control group 50 (30) ($P<0.001$). Incidence of side effects were similar among the groups ($P>0.05$).
Conclusion: Application of trans-dermal nicotine patch at the venous cannulation site 1 h before venous cannulation decreases both the incidence and severity of venous cannulation pain.

References

1 Decker MW, Meyer MD, Sullivan JP. The therapeutic potential of nicotinic acetylcholine receptor agonists for pain control. *Expert Opin Investig Drugs* 2001; **10**: 1819–30
2 Hong D, Conell-Price J, Cheng S, Flood P. Transdermal nicotine patch for postoperative pain management: a pilot dose-ranging study. *Anesth Analg* 2008; **107**: 1005–10

Paper No: 1063.0

Intravenous clonidine improves glycemic control in type-2 diabetic patients undergoing laparoscopic cholecystectomy

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Perioperative stress is due to a variety of factors including surgery, anxiety, anaesthesia induced stress, perioperative pain, postoperative nausea and vomiting, shivering, hyperglycemia, infection etc. Catacholamines are the most important mediator of acute stress leading to glycogenolysis, gluconeogenesis, lipolysis, ketogenesis and perioperative insulin resistance leading to hyperglycemia. It is logical to assume that by decreasing the stress response a better perioperative outcome is anticipated. Perioperative hemodynamic parameters and blood glucose levels may be surrogate markers of stress.
Clonidine which is alpha 2 agonist has several properties which may be helpful. The major pharmacological effects of clonidine involve changes in blood pressure and heart rate. The effect of clonidine in the perioperative period on the blood glucose level is still not clear as some studies propose a better glycemic control due to blunting of catecholamine surge. On the other hand others suggest that clonidine leads to decreased insulin secretion leading to hyperglycemia.
The aim of study is evaluate the efficacy of IV clonidine on blood glucose level of type-2 diabetic patients undergoing laparoscopic cholecystectomy, and also secondary parameters like safety of clonidine in the study group and its efficacy on postoperative nausea and vomiting.
After obtaining Ethics Committee approval and informed consent of patients a prospective, randomized double blind, placebo controlled study was conducted on ASA I & II 100 adult patients(18-60years) of either sex undergoing elective laparoscopic cholecystectomy. Patients were divided in two groups with group I receiving IV clonidine 3 mg/kg in normal saline was infused over 15 minutes and Group II receiving a placebo in similar manner. Insulin (short acting huminsulin, regular monocomponent)therapy was started just before induction of anesthesia @1.25 U/hr and supplement insulin given according to blood glucose levels (BGL). Capillary concentration of glucose was measured every 30 minutes during surgery.
Demographic data were recorded. BGL before induction of anesthesia, antidiabetic treatment (diet alone, oral hypoglycaemic agent, insulin therapy). Systolic blood pressure (SBP) and mean blood pressure(MBP),heart rate(HR) meausured before adminstring the drug and every 15 minutes after administration of the drug. Any side effect in the form of hypotension and bradycardia were noted and those were excluded from the study.
The conclusion of the study is that sympatholytic effects of clonidine may be utilized to decrease the excursion in blood glucose levels and thereby decreasing intraoperative insulin requirements during laparoscopic cholecystectomy in the type2 diabetic patients. Clonidine also attenuates the hemodynamic response to intubation and pneumoperitoneum.

Paper No: 1078.0

Evaluation of haemodynamic and electrolyte changes in patients undergoing liposuction with two types of fluid therapy

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Introduction: Liposuction is one of the most frequently performed aesthetic procedures The 'tumescent technique' of liposuction involves subcutaneous infiltration of large volume of saline containing lignocaine and epinephrine. The extent to which this subcutaneous infiltrate gets absorbed into the intravascular and interstitial compartments is not known. The fluid shifts during large volume liposuction may have a potential for haemodynamic and electrolyte disturbances. Use of colloids in place of crystalloids reduces the volume of intravenous fluids while maintaining haemodynamics. However, their use has not been explored in patients undergoing tumescent liposuction. This study was undertaken to compare saline with hydroxyethylstarch 6% (130/0.4) [HES] for intra-operative fluid resuscitation in patients undergoing large volume liposuction.
Objective: To compare haemodynamics and serum electrolytes using intravenous normal saline versus HES during large volume liposuction.
Methods: After approval from the hospital ethics committee and patients' informed consent, a prospective, randomized study was conducted on 50, ASA grade II and III adult patients scheduled to undergo large volume liposuction under general anaesthesia. Patients with coagulopathy, cardiovascular or renal disease were excluded.
Patients were allocated using computer generated randomization tables to two groups of 25 patients each, to receive either 0.9% normal saline (Group A) or HES (Group B) as the intravenous fluids. Intraoperative fluids for Group A were calculated using 'Rohrich Formula' keeping intravenous fluid plus infiltrate to aspirate ratio of 1.2. For group B, one-third the calculated intravenous volume was infused as HES. Statistical analysis was done using SPSS 17.0.
Results: The demographic profile was comparable in both groups ($p>0.05$).The infiltrate volume was $6.84+/-2.17$ liters in group A and $6.59+/-1.42$ liters in group B ($p=0.635$). The total aspirate volume was $8.23+/-2.46$ liters in group A and $8.22+/-2.77$ liters in group B ($p=0.983$). The total I.V. fluid infused in group A was $2.93+/-1.37$ liters and $1.09+/-0.7$ liters in group B ($P<0.001$). There was no difference in the intraoperative and postoperative haemodynamics (pulse rate, blood pressure and central venous pressure) in both the groups ($p>0.05$). The average postoperative sodium level in group A was 139.22 mmol/l compared to 137.48 mmol/l in group B ($p=0.065$). There was no difference in the postoperative potassium level in both the groups, 4.04 mmol/l in group A compared to 4 mmol/l in group B ($p=0.456$).
Conclusion: Low volumes of hydroxyethylstarch 6% (130/0.4) are equally efficacious as normal saline for large volume liposuction. It may be beneficial in patients at risk of cardiac compromise.

Answers to Reviewers Comments
1. Authors did not receive any financial support from the manufacturers of HES.
2. As incorporated in the methodology, patients with coagulopathy were excluded. With an average 1 liter infusion of hydroxyethylstarch 6% (130/0.4) derangement in coagulation profile is not expected. Therefore coagulation profile was not monitored postoperatively.
3. With tumescent technique there is decreased blood loss due to vasoconstriction and therefore the perioperative bleeding is minimal.

References

1 Coleman W. The history of liposuction and fat transplantation in America. *Dermatol Clin* 1999; **17**: 723–7
2 Klein JA. The tumescent technique for liposuction surgery. *Am J Cosmet Surg* 1987; **4**: 263–7
3 Kenkel JM, Brown SA, Love EJ *et al.*. Hemodynamics, electrolytes, and organ histology of larger-volume liposuction in a porcine model. *Plast Reconstr Surg* 2004; 113:1391–9
4 Rohrich RJ, Rod J *et al.*. Fluid resuscitation in liposuction: A retrospective review of 89 consecutive patients. Amer Soci Plast Surg 2006; **117**(2): 431-5
5 Choi PT, Yip G, Quinonez LG, Cook DJ. Crystalloids vs. colloids in fluid resuscitation: A systematic review. Crit Care Med 1999; 27:200–10

Paper No: 1081.0

Correlates of Unanticipated Difficult Intubation Using a Large National Anesthesia Registry

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Introduction: In 2005, the Anesthesia Business Group (ABG) created a national registry of clinically-enhanced administrative data for the purpose of performance benchmarking of clinical quality outcomes. This investigation describes the methodology used to analyze cases from three large anesthesia groups (SMG, PMC & AMG) participating in the ABG registry from 2007 - 2010. For this analysis, unanticipated difficult intubation was selected as a clinical outcome1.
Methods: 182,028 cases were identified from the three groups mentioned above. Some 399 cases of unanticipated difficult intubation were identified. Unanticipated difficult intubation was defined as greater than 2 attempts by the staff anesthesiologist. Predictors include age, gender, American Society of Anesthesiologists physical status (ASAPS) classification, and Current Procedural Terminology2 (CPT®) code at

the time of surgery. CPT® codes were grouped into six broad anatomic categories that included head and neck, thoracic, abdominal, pelvis, extremities, and spine for the purposes of this analysis. 113,899 comparison cases with the same CPT® codes as the unanticipated difficult intubation were used for the analysis. Multiple logistic regression analysis was used to identify significant predictors of unanticipated difficult intubation.

Results: After adjusting for age, those with unanticipated difficult intubation were more likely to be male [Odds Ratio (OR)=1.58, 95% Confidence Interval (CI)=1.29, 1.93]. Risk of unanticipated difficult intubation increased in a near-linear fashion with increasing ASAPS classification.

ASAPS Classification Odds Ratio 95% CI Demographic data and physical status classification can help identify patients with potential unanticipated difficult airway. This analysis shows the power of a large national database to identify significant differences in clinical quality outcomes.

References

1 Rose KD, Cohen MM. The airway: problems and predictions in 18,500 patients. *Can J Anaesth* 1994; **41**(5): 372–83

2 CPT 2011 Professional Edition, American Medical Association The project is supported by a grant from The Doctors Company Foundation

Paper No: 1082.0

Comparison of the Efficacy of Dexmedetomidine and Esmolol in the Treatment of Increased Hemodynamic Response during the Recovery Period

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Introduction: Hemodynamic response during endotracheal extubation is a serious complication. It can be harmful especially in patients who have certain type of surgeries (intracranial, intraocular).1 All efforts should be shown in order to attenuate hemodynamic response during extubation.

Objective: The aim of our study was to compare effectiveness of esmolol and dexmedetomidine in the treatment of increased hemodynamic response during anesthesia recovery period.

Methods: Sixty ASA I-II patients whom scheduled for elective surgery with endotracheal intubation were randomized at the end of surgery according to their hemodynamic parameters that were increased 20% of their baseline values in order to receive 1 mg/kg esmolol (group E, n=30) or 0.5 μg/kg dexmedetomidine (group D, n=30). Before induction (C), before study drug (T1) and at 1st, 3rd, 5th and 10th min after the study drug administration (T2, T3, T4, T5), before extubation (T6), and just after extubation (T7), at 1st, 3rd, 5th, 10th, and 15th min after extubation (T8,T9,T10,T11,T12) heart rate(HR), systolic blood pressure(SBP), diastolic blood pressure(DBP), mean blood pressure(MBP), peripheral oxygen saturation(SpO2), end tidal carbon dioxide(ETCO2) values were recorded. Extubation time and recovery time were recorded. The time until the need of analgesic(VAS>4)was recorded. Cognitive functions were evaluated by 'short orientation memory concentration test (SMOCT)' at 20th and 50th min.

Results: After giving the study drugs, HR reductions at all periods were significant in groupD(T2-T10: $p<0.001$, T11:$p=0.001$,T12:$p=0.006$). In groupD SBP was high at3rd min after drug($p<0.001$), and SBP were lower in all periods before and after extubation(T6-T10: $p<0.001$,T11:$p=0.02$,T12:$p=0.04$). In groupD, DBP was higher at 1st min after drug($p=0.001$), DBP were lower at 10th min after drug and before extubation($p=0.045$,$p=0.001$). In groupD MBP 3rd min after drug was higher ($p=0.019$) and MBP were lower at all other periods(T4-T10:$p<0.001$, T11:$p=0.001$, T12:$p=0.03$).SpO2 in groupD was higher at all periods after drug($p=0.001$, $p=0.003$, $p=0.002$, $p=0.007$, p=0,001, $p=0.001$, $p=0.002$, $p=0.001$). In groupD ETCO2 values at 5th and 10th min after drug were higher ($p=0.44$, $p=0.49$). The time until the need of analgesic and recovery period were longer in dexmedetomidine group ($p<0.001$).

Discussion and Conclusion: Although both esmolol and dexmedetomidine attenuated the hemodynamic response during recovery period, dexmedetomidine was more effective in hemodynamic stabilization and time until the need of analgesic was longer. Dexmedetomidine was an agent that could be chosen for the attenuation of hemodynamic response during the extubation period. Esmolol provided faster recovery time. We believe that in order to get more effective attenuation of hemodynamic response, dosage studies with esmolol are needed.

Reference

1 Miller KA, Harkin CP *et al.*. Postoperative tracheal extubation. *Anesth Analg* 1995; **80**: 149–72

Paper No: 1087.0

Intraoperative cardiac arrest and mortality in trauma: a study over 14 years from a brazilian teaching hospital

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Introduction: Trauma plays an important role in public health. Hence, efforts must aim at their prevention and care of the victims1.

Objectives: This survey evaluated the incidence, causes and outcome of intraoperative cardiac arrests as consequence of trauma in a Brazilian tertiary general teaching hospital over 14 years.
Methods: After obtaining approval from Medical Ethics Committee, this retrospective survey analyzed all reported intraoperative cardiac arrests in 90,909 consecutive anesthetics from January 1996 to December 2009. Data was collected from an anesthesia database, and medical and anesthesia records. Data collected from intraoperative cardiac arrest due to trauma included patient characteristics, surgical procedures (elective, urgent or emergency), ASA physical status classification, anesthesia provider information, surgical areas and traumás cause, and cardiac arrest and mortality rates. The Tukey test for multiple comparisons and X2 test were used for statistical analysis. $P<0.05$ was considered statistically significant.
Results: Fifty-eight cardiac arrests (6.4:10,000 anesthetics) and 47 deaths (5.2:10,000 anesthetics) were found in patients with trauma, corresponding respectively to 21.6% and 26% of the total number of cardiac arrests (269) and deaths (181) obtained in the study. Patients with major risk for cardiac arrest and mortality in trauma were: young (18 – 35 years) male patients (4.5:1 compared with female), ASA IV or poorer physical status, in emergency surgery and under general anesthesia for multiclinical, gastroenterological, thoracic, neurosurgery or orthopedic surgery ($P<0.05$). Hemorrhage was the major cause of cardiac arrest and mortality. Considering all causes of intraoperative cardiac arrest and deaths, trauma was the second cause of cardiac arrest and the first cause of mortality. The most important causes of intraoperative cardiac arrest in trauma were motor vehicle crashes (55.2%), penetrating trauma with stab wounds (12.1%) or gunshot wounds (8.6%), running over (8.6%), and beating (6.9%).
Conclusions: The study showed higher intraoperative cardiac arrest and death rates in patients with trauma. Patients with risk for cardiac arrest and mortality are young male with severe underlying condition and under emergency surgery. The most important causes of trauma are motor vehicle crashes and violence.

Reference

1 Dias AR, Abib S de C, Poli-de-Figueiredo LF, Perfeito JA. Entrapped victims in motor vehicle collisions: characteristics and prehospital care in the city of São Paulo, Brazil. *Clinics (Sao Paulo)* 2011; **66**: 21 – 5

Paper No: 1096.0

Tracheobrochopathia osteochondroplastica causing unexpected difficulty in tracheal intubation

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Introduction: Tracheobrochopathia osteochondroplastica is a rare benign dysplasia of the tracheas and large bronchi, characterized by calcifying cartilaginous outgrowths in to the tracheal lumen. It is often asymptomatic and may be undiagnosed. We report this disorder in a female patient with an unusual symptom which caused difficulty in tracheal intubation.
Case Presentation: A 54-year-old woman was presented for a pelviscopic salpingo-oorphrectomy due to left ovarian cyst with general anesthesia. She had no any specific respiratory symptoms. On the day of surgery anesthesia was induced with propofol and muscle relaxation was achieved with rocuronium. On the laryngoscopy, the larynx was easily visualized, but when a size 7.5 cuffed tracheal tube was passed through the cords subglottic resistance was occurred. As there was no tracheal air leakage, it was decided to proceed with surgery. During the surgery fiberoptic brochoscopy was performed through the tracheal tube. There were superficial nodular lesions, which spread down the trachea to the carina and into the main bronchi. The operation was performed without any problems and the postoperative period was unremarkable. Two days after the operation the patient was referred to the respiratory physician. The bronchoscopy was performed. The findings showed prominent protrusion with narrowing of the tracheal lumen and main bronchi. The bronchoscopic diagnosis was tracheobrochopathia osteochondroplasica.
Conclusion: Anesthetic considerations for tracheobrochopathia osteochondroplasica are similar to tracheal stenosis. When the disorder is suspected difficult intubation should be anticipated.

Reference

1 Khan AM, Klapper P, Jain VR, Mahadevia P, Berman AR. Tracheobrochopathia osteochondroplasica, An entry diagnosed on bronchoscopy. *J Bronchol* 2006; **13**: 99 – 101

Paper No: 1132.0

Anesthesia Management in Intracranial Juvenile Nasopharyngeal Angiofibroma

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Juvenile nasopharyngeal angiofibromas are rare, benign but aggressive tumors for which surgical resection is the treatment of choice. Tumor resection can be accompanied by significant blood loss and postoperative morbidity. Despite the advances in radiological imaging, embolisation of vascular supply and endoscopic resection, these tumors continue to be a challenge and require multidisciplinary

management. The tumors though superficially similar in terms of high vascularity, proximity to neurovascular structures as well as difficult anatomical location require differing anaesthetic management depending on the tumor type and location. A 18- year old boy was referred to our center with 6 month history of progressive nasal obstruction and repetitive episodes of epistaxis moderate in severity. Biopsy under anesthesia confirmed the diagnosis of angiofibroma. The patient was for invasive tumor underwent preoperative radiotherapy & chemotherapy. In physical examination, was found Chemosis and proptosis in the left side and tumor in the left maxillary sinus that progressive to mouth. Cranial nerves (I,II, IX,X) function were abnormal and other finding examination was Uvula dislocated to left side. A CT scan and an MRI scan were performed demonstrating a mass with extension to frontal lobe, nasal, oral cavity and paranasal sinus and into the sphenoid and were involved the sinuses. The day before surgery, the patient underwent angiography with embolization of feeding vessels from the distal external carotid system. The patient candidate for craniotomy. The evaluation of possible difficult intubation or ventilation was performed, and revealed a Mallampati grade 2, opening mouth and thyromental distance was normal. Despite of history of tumor, possible airway involvement by angiofibroma, made decided to awake intubation. Patient is placed in head up position to improve venous drainage, reduce the blood loss and clear surgical field. Patient is placed in head up position to improve venous drainage, reduce the blood loss and clear surgical field Premedication consisted of fentanyl 50 μg and 1 mg (IV) midazolam, and lidocaine 1% 2ml into the tracheal tube, bicoronal hyoid 2 ml, hard palate and Uvula lidocaine spray administrated, then the patient underwent laryngoscopy and Cormack grade 2 viewed and intubated with No. 7 tube. The anesthesias induction was made with intravenous Thiopental 5 mg/kg and atracurium 0.2 mg/kg. Monitoring included invasive arterial monitoring, central venous pressure, ECG, temperature, urine output and SPO2. The anesthesia was maintained with profofol 100 μg/kg/min, remifentanyl 0.1 μg/kg/min. After the end of surgery removed to ICU underwent mechanical ventilation and intubated. The patient was sedated with propofol 50 mg/hr, fentanyl 50 μg. Propofol continued till 2 days in ICU, Finally, regard to contious and respiratory condition extubated. With nasopharyngeal angiofibroma, it is better to proceed with awake fiberoptic intubation in the sedate. The presence or suspicion of airway difficulty mandates awake direct or fiberoptic laryngoscopy. Various airway management techniques should be well known to the anesthesiologists handling cancer patients. Besides the routine monitoring, invasive monitoring like arterial blood pressure and central venous pressure monitoring may be required major surgery with anticipated blood loss or because of the to associated co morbid disease. Urinary catheterization and temperature monitoring is essentia.

Paper No: 1134.0

Anesthesia in endoscopic and microscopic (hybrid) transsphenoidal surgery for a pituitary adenoma in cushing's disease- a case report

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Cushing's disease is a multi-etiologic clinical situation, resulting in several features like obesity, hyperglycemia, hypertension, proximal muscle weakness, skin thinning, buffalo hump, and purple striae. In perioperative period the anesthesiologist must deal with difficult ventilation and intubation, hemodynamic disturbances, volume overload and hypokalemia, glucose intolerance and diabetes, maintaining the blood cortisol level and preventing the glucocorticoid deficiency. This disease is quite rare and its features make these patients very difficult to the anesthesiologist.

A morbidly obese 7-year-old male (Height 115 cm, weight 60 kg, body mass index 45.5 kg/m2, ASA II) presented with a recent history of weight gain and the development of diabetes mellitus, which was managed with diet and oral hypoglycemic drugs. Physical examination revealed the typical physical features of Cushing's disease. So that, was consulted by an endocrinologist and diagnosis of Cushing's disease confirmed by the endocrinologist. He underwent a dynamic MRI showed a pituitary microadenoma (size 3 mm), central in the gland. Clinical assessment, chest x-ray and electrolytes findings were normal. Preoperative hypertension (172/85 mm Hg) was treated with metoprolol, whereas hyperglycemia (196 mg/dl) with insulin regimen. Complete airway obstruction, sleep apnea problems were not been reported. There was, however, paroxysmal nocturnal dyspnea. The evaluation of possible difficult intubation or ventilation was performed, and revealed a Mallampati grade 2, opening mouth 2.5 finger width. The thyromental distance was normal. After 8 h of fasting, Premedication consisted of fentanyl 120 μg and 1.2 mg (IV) midazolam. In operating room after peripheral venous cannula was inserted, right radial artery and right internal jugular vein were cannulated. The anaesthesia induction was made with intravenous, Thiopental 300 mg titrated, Succinylcholine 60 mg, then tracheal intubation performed with No. 5.5 tube and atracurium 18 mg IV was administrated. Monitoring included invasive arterial monitoring, central venous pressure, ECG, temperature, urine output, end-Tidal carbon dioxide, and blood cortisol and sugar levels and electrolytes. The anaesthesia was maintained with profofol 60 mg/h infusions, O2/N2O 3 L/ min, and atracurium 5 mg PRN. The patient undergo transsphenoidal adenomectomy. The patient was transferred to ICU and

extubated after surgery with no anaesthetic complications. We conclude that Cushing's disease presents a challenge to anesthesiologist. We must deal with the volume overload, hyperglycemia, hypokalemia, difficult airway and ventilation. Especially, we consider in the patients anaesthesia hemodynamic stability, maintenance of cerebral oxygenation, and provision of conditions to facilitate surgical exposure, prevention of intraoperative complications and rapid emergence to facilitate early neurological assessment.

Paper No: 1135.0

Anaesthetic Management of a Case of Osteogenesis Imperfecta

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Osteogenesis Imperfecta is a fibro-osseous disorder of the collagen tissue that leads to defects in skeletal growth and causes short stature. Osteogenesis Imperfecta poses various anesthetic challenges, which include difficult intubation, problems with positioning and a tendency to develop malignant hyperthermia, coagulopathy and cardiovascular abnormalities. Our patient was a 6-year-old boy with height of 119 cm and body weight of 25 kg, who had multiple fractures since he was 7 months old and was diagnosed with Osteogenesis Imperfecta genetically diagnosed as type I according to the Sillence classification. He had a history of frequent long bone fractures even after infancy. He was scheduled for tibial osteotomy. The patient reported no previous medical history other than this condition and was hospitalization for treatment. On airway assessment, he had no maxillofacial deformity, scoliosis and macroglossia, but revealed a Mallampati grade 2. The extension and flexion of the neck, thyromental distance, and upper lip-biting test were normal.

Premedication consisted of fentanyl 25 μg and midazolam 0.5 mg (IV)then Thiopental 125 mg and atracurium 10 mg were administrated under direct laryngoscopy. Intubation was performed with tracheal tube 5.5 NO. The anaesthesia was maintained with profofol 15 ml/h and O2/N2O 3L/ min. Monitoring included invasive arterial monitoring, ECG, SPO2, temperature and urine output. The patient was extubated after surgery and awakened with no anaesthetic complications. In conclusion, we like to emphasize the need for a detailed pre-operative evaluation and preparation for anaesthesia. In a patient with osteogenesis imperfecta, special attention is required to rule out associated cardiovascular abnormalities, bleeding disorders and difficult airways before undergoing anesthesia. Gentle care is also essential during the positioning and the transfer of these patients. A successful outcome was ensured by careful history taking and examination as well as gentle care and the application of basic principles in managing the patient.

Paper No: 1140.0

Review of the current situation of the nomenclature and presentation of the ampoules and serums in argentina

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Introduction: Nowadays, there are common errors in the anesthetic practice regarding medication identification contained in ampoules and serums. Some countries in the world have laws that regulate drugs´production, as well as their pharmaceutical presentations. In Argentina, such regulation has not been approved yet, which makes the existence of a unified criterion for drug nomenclature and presentation difficult.
Objetive: Identify the current situation of the public hospital (GCBA and Buenos Aires province) in respect of those most common errors of the anesthetic practice related to the confusion of ampoules and serums due to the similar presentations.
Methods and Materials: Multicentric, descriptive cross-sectional study, applied to the target population (residents of GCBA hospitals and of the Bs. As province [R]) as a census and an intentional consecutive sampling (staff physicians of the same hospitals [S]) through a multiple choice questionnaire. The information obtained are treated with the chi-square test for proportions comparison, considering significant a $p<0.05$.
Results: From the 189 surveyed people, 133 are residents (of a total of 164) and 47 are anesthesiologists. The average of performed anesthesia per week is of 19+/−6.8 (S=19+/− 7.2; R=14+/−6.6). 70% declared the current presentation of ampoules and serums to be confusing in order to identify the drug correctly, 80% took a drug by error believing that it was another one, and from these, 74 % referred to repeat the error at least once a month. 34 % discovered the error after the administration of the drug, with a side-effects incidence of 8.9% (S=4% vs R=11% p=0.19). Even though S subgroup confuse more frequently the presentation of drugs than R subgroup (96% vs. 74% p=0.0017), there were no significant differences when injecting the drug (S=45% vs R=31% p=0.08). The association which produced more confusion is certain commercial ratios of dextamethasone/metoclopramide followed by mannitol / physiologic solution.

Conclusions: Nowadays, where there is no regulation of ampoules and serums production, the re-checkup of the drugs to use is particularly important to decrease the probabilities of making an error in the confusing presentations. Beyond the actions aimed at the safety and quality of the surgical patient enforced by the AAARBA and FAAAAR, the approval of the Bill N°16.643 that refers to the general rules of Good Practices of Manufacturing for Drug Manufacturers, Importers/Exporters created by the ANMAT [National Administration of Foods, Drugs and Medical Technology] is necessary.

References

1 Consenso sobre Identificación de los Envases por Color de las Soluciones Parenterales – Convenio AAARBA – Laboratorios de Especialidades Medicinales. 2003

2 NHS - Design for patient safety - A guide to labelling and packaging of injectable medicines - Edition 1 - 2008

3 Institute for Safe Medication Practice – Errors Reporting Program. www.joinycommission.org – 2008

4 Poon EG, Keohane CA, Yoon CS, et al. Effect of Bar-Code Technology on the Safety of Medication Administration. N Engl J Med 2010; 362:1698–707

Paper No: 1142.0

Technical failure checkup in the anesthesia machine: lessons learned from the anesthesiology department of Ramos Mejia General Hospital

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Introduction: The risk involved for the patient of potential failure in the anesthesia equipment together with an inappropriate training of the professionals, led instructors of the Department to include in the residency training, practical simulation test of failure in the pre-anesthetic checkup.

Objectives: To assess the influence of an educational intervention to reduce the incidence of errors in the pre-anesthetic checkup.

Methods: Quasi-experimental study before-after the educational intervention on safety. Pre-intervention-Stage: scenarios based on simulation were created to measure the performance of 25 professionals while doing the prior checkup of the anesthetic equipment before the entry of the first patient to the OR. Recognition and control of 6 pre-established failures was found in Drager-Fabius machines, chosen according a frequency and gravity criterion potential to the patient. An external observer performed a subjective assessment of pre-anesthetic checkup process integrity. Intervention-Stage: It consisted of four lessons about security and safety. Post-intervention-Stage: The same scenario correspondent to the first stage was re assessed, post intervention. For the comparison of the occurrence proportions the Fisheŕs Exact Text was used.

Results: Pre-intervention Stage: 100% participants verified 71% of the items from the checklist of the ASA. The most predominant lack of control was that there was no verification of the vaporizer (ignored by 60%). The second was the verification of the electric connection (52%). Finally, the third was the ventilatoŕs configuration (48%). Post-intervention Stage: 100% participants checked 92% of the items from the ASA. The least assessed failure was the verification of the vaporizer (40% ignored this checkup). The second was the verification of the ventilatoŕs parameters (32%); however, in the subjective comprehensive assessment, it was observed that the proportion of the participants who performed the verification was higher (92% vs. 68%) but in post induction stage, so it did not appear as checked in the assessment files. The third item, less verified, was the electric connection (24%). The p values for the proportions differences of the three most predominant failures were: 1) No checkup of the vaporizer: $p=0.173$; 2) No checkup of the electric connection: $p=0.048$; 3) No ventilatoŕs checkup: $p=0.267$. However, the global checkup of the items from the checklist of the ASA improved significantly post intervention ($p=0.0012$).

Conclusions: The failure checkup of the anesthetic equipment is still a pending matter, being the latent-error a potential danger for the patient́s safety. The educational interventions must be continuous.

References

1 Caplan R, Vistica M, Posner K, Cheney F. Adverse anesthetic outcomes arising from gas delivery equipment: a closed claims analysis. *Anesthesiology* 1997; **87**: 741–8

2 Merry A, Weller J, Robinson B, Warman G, Davies E, Shaw J, Cheeseman J, Wilson L. A simulation design for research evaluating safety innovations in anaesthesia. *Anaesthesia* 2008; **63**: 1349–57

3 Recommendations for Pre-Anesthesia Checkout Procedures (2008) Sub-Committee of ASA Committee on Equipment and Facilities

4 Goldhaber-Fiebert SN, Goldhaber-Fiebert JD, Roscow CE. Knowledge-based errors in anesthesia: a paired, controlled trial of learning and retention. *Can J Anaesth* 2009; **56**: 35–45

Paper No: 1153.0

The availability of core anaesthetic guidelines: fact or fiction?

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Introduction: National collegiate guidance recommends that a set of core guidelines should be displayed or immediately available in all locations where anaesthesia is delivered. The management of malignant hyperthermia, anaphylaxis,

severe local anaesthetic toxicity, peri-arrest arrhythmias, failed intubation and ventilation drills and anaesthetic machine checklists fall within this remit (1).

Objectives: To determine the availability of core anaesthetic guidelines at sites of anaesthesia within a UK teaching hospital. To evaluate anaesthetists' expectations of guideline availability and confidence at working without immediate access to guidelines.

Methods: An audit was undertaken to ascertain the presence of up-to-date anaesthetic guidelines within the proximity of every anaesthetic machine throughout a London teaching hospital (n=77). A two-page questionnaire was subsequently distributed to anaesthetists working within this institution (n=50).

Results: Guidelines were unavailable in 48% of locations. 15.5%, 40.4% and 2.5% of anaesthetic machines, were found to have up to two, four and six guidelines available, respectively. The commonest guideline was anaphylaxis management (40.3%), followed by malignant hyperthermia (36.8%), peri-arrest arrhythmias (33.8%), anaesthetic machine check (32.5%), failed intubation and ventilation (28.6%) and local anaesthetic toxicity (13.2%). 16.9% of guidelines found were up-to-date. 22% of locations were remote sites.

Most anaesthetists expected to find guidelines for anaesthetic machine checks (98%), anaphylaxis (96%), failed intubation and ventilation drills (96%), malignant hyperthermia (88%), local anaesthetic toxicity (72%) and peri-arrest protocols (68%), on the anaesthetic machine or displayed within eyesight of an anaesthetic. 86% of respondents were 'somewhat confident' at managing emergencies without immediate access to guidelines. 48% correctly described the initial dose of adrenaline in anaphylaxis management, compared to 30% for dantrolene and 26% for intralipid. Only 30% and 34% of respondents could identify the nearest location of intralipid and dantrolene in comparison to 70% for difficult airway trolleys.

Conclusions: Cognitive aids, such as guidelines, are widely used within many high risk industries and recommended during simulation training (2). Our findings suggest that anaesthetists have come to rely heavily upon these tools and expect to utilise them during emergent care. However, if the availability and integrity of such aids are fiction, as seen here, rather than fact, this discrepancy can compromise patient care. This audit suggests the need for a responsible designated lead within each department to ensure that guidelines are continuously monitored and updated, and the development of innovative methods to display guidelines and the location of emergency drug and equipment.

References

1 Royal College of Anaesthetists. Curriculum for a CCT in Anaesthetics. 2010; Available from: www.rcoa.ac.uk/docs/CCTparti.pdf Accessed. August 2011

2 Harrison TK, Manser T, Howard SK, Gaba DM. Use of cognitive aids in a simulated anesthetic crisis. *Anesthesia & Analgesia*. 2006; **103**(3): 551

Paper No: 1165.0

Intraperitoneal nebulization prevents central temperature drop during laparoscopic surgery

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Introduction: Slight hypothermia (central temperature 33-36Â°C) may produce cardiac, respiratory, immunologic and coagulation complications after laparoscopic surgery1. Animal studies using microvibration-based nebulization device (Aeroneb ProÂ® system, Aerogen, Galway, Ireland) suggested that cold nebulization prevents loss of central temperature produced by CO2 pneumoperitoneum2. However, the effect of cold nebulization on central temperature was not previously tested during surgery in humans.

Objectives: This retrospective analysis was designed to evaluate the effects of cold nebulization with a microvibration-based nebulization device on central temperature after laparoscopic surgery.

Methods: Data of four randomized, controlled, double blinded clinical trials were analyzed. In the studies ARHSG 01â€“2008 (Gynecological surgery) and ARHSG 02-2008 (Cholecystectomy) patients received nebulization of Ropivacaine 30 mg, instillation of Ropivacaine 100 mg or no treatment. In the study ARHSG 01-2010 (Cholecystectomy) patients received nebulization of Ropivacaine 50, 100 or 150 mg. In the study ARHSG 02-2010 (Ovarian cyst) patients received nebulization of Ropivacaine 150 mg or instillation of Ropivacaine 150 mg. Ropivacaine was nebulized using the Aeroneb ProÂ® system (Aerogen Galway, Ireland) through the umbilical port during surgery. All patients received a standard anesthesia and post-operative analgesia protocols. Operating room temperature was set at 21Â°C and patients were kept warm using forced warm-air device and warmed intravenous solutions. Temperature (primary end-point) was measured continuously during surgery using an esophageal probe. The variation of central temperature, the proportion of patients with a temperature drop between 0.5-1Â°C and the proportion of patients developing slight (33-36Â°C) hypothermia were compared in patients receiving peritoneal nebulization (nebulization group) with those receiving instillation or no treatment (control group).

Results: This analysis included 308 patients, 212 in the nebulization group and 96 in the control group. Intraoperative variation of central temperature was lower in patients in nebulization group (-0.2 Â± 0.4Â°C) compared with patients in the control group (-0.4 Â± 0.4Â°C) ($p<0.05$). When surgery length more than 60 minutes the proportion of patients with a temperature drop between 0.5-1Â°C was

lower in nebulization group (23%) compared to control group (36%) ($p<0.05$). When surgery length more than 60 minutes the proportion of patients developing slight hypothermia was significantly lower in nebulization group (20%) compared with control group (40%) ($p<0.01$). **Conclusions:** Cold nebulization reduced intraoperative variation of central temperature. When surgery last more than 60 minutes, cold nebulization prevents slight hypothermia in adult patients undergoing laparoscopic surgery.

References

1 Slotman GJ, Jed EH, Burchard KW, Adverse effects of hypothermia in postoperative patients; *The American Journal of Surgery* **149**: 1985

2 Schlotterbeck H, Schaeffer R, Dow WA *et al.*, Cold nebulization used to prevent heat loss during laparoscopic surgery: an experimental study in pigs; *Surgical Endoscopy* 2008; **22**: 2616–2620

Paper No: 1167.0

Which is the better anesthesia technique to undergo to a a Double Balloon Endoscopy in patients with severe multiple diseases?

Silvia Niveyro, Claudia Fuxman, Florencia Werhum, Eduardo Bilesio and Guillermo Orce

HUFFavaloro

Introduction: A double balloon endoscope (DBE)can be inserted into deeper portions of the small intestine via both oral and anal approaches, and allows observation as well as treatment of small intestinal diseases.
Objectives: To demonstrate that DBE examination can be safely performed in general anesthesia with intubation and that this method is the option in patients (pts) with severe multiple morbidities.
Material and Methods: A retrospective evaluation of general anesthesia with intubation in pts with severe multiple morbidities undergoing DBE was performed at Servicio de Gastroenterología, Hospital Universitario Fundación Favaloro. Pts were grouped on gender, age, physical state, indication, endoscopic finding, DBE related complication and examination duration. Regarding anesthesia records included the duration of anesthesia, the quantities of medications used and complications.
Results: Data obtained from 45 DBE performed in 32 pts from April 2009 to July 2011 were analyzed (15 antegrade, 4 retrograde and 13 both). The indications included gastrointestinal bleeding, anaemia, malabsorption and suspected inflamatory bowel disease. 14 (43.75%) were female and 18 (56.25%) male. Middle age was 65.4 (SD 28.88). The ASA score were ASA II 1 pt (3.1%), ASA III 15 pts (46.88%) and ASA IV 16 pts (50%). Most of the pts were intubated (96.87%). The middle examination time was 112.9 minutes (SD 45-240). 27 pts (84.10%) had endoscopic findings and endoscopic therapeutics were performance in 20 (62.5%) of them. Complication related to anesthesia was observed in 1 pt (3.1%) and related to the DBE 1 pt (3.1%). The complications werw desaturation post extubation need orthopnea and supply of O2 mask and intestinal perforation, respectively, in different patients.
Discussion: In our experience we found the most important advantage of general anesthesia with intubation over other methods was the advantage of ensure stable airways, wich makes it easy to counter act frequent complications. Turn is essential to ensure not to increase the possibility of complacations given the condition of patients, often with significant morbid antecedents.
Conclusions: DBE needs sufficient hypnosis and relajation technique, because the examination is uncomfortable and lengthy so we recommend this procedure in terms of anesthesia suitable for development. At this moment the general anesthesia with intubation is the best option in our consideration.

Paper No: 1185.0

"Is there a doctor on board?"-What to do in case of a medical emergency during mid-flight? Due to the design of this format it was not possible to copy the tabel in this box. The results are supposed to be shown in a tabel!!

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Introduction: Providing emergency medical care when you're miles above the earth is any physician's nightmare. In-flight medical emergencies occur as frequently as 1:11,000 passengers(1,2). Most common medical problems include cardiac, neurological, gastro-intestinal, traumatic and respiratory problems(2). Physicians may be reluctant to assist due to fear of liability, lack of medical treatment options and unfamiliarity with the drugs/equipment on board.
Objectives: To inform physicians about the stress of air travel, the most common medical problems on board and the medico-legal aspects of providing medical care during flights.
Methods: A Pubmed literature search: 'emergencies', 'in-flight', 'management' and 'liability'.
Results: Tabel 1 shows the in-flight medical emergencies with possible solutions(1-4). Category Problem Solution Passenger-Cabin environment - Oxygen, hydration

- Lack of space - In-flight movement compression stockings
- Dehydration - Hydration, warm blankets
- Pre-existing - Medical clearance/ doctor's conditions note, alarm bracelet
- Pregnancy - No flying after 36 weeks of gestation
- Recent surgery - Physician pre-flight screening
- Scuba diving - Don't fly within 12-24 hours of diving
- Forgotten/lost - Adjusting medication medication or intake schedules, medication medication in within reach check-in luggage
- Injured/sick - Notify flight attendant, patient postpone flying
- Illicit drug or - Airline carrier protocol alcohol abuse Physician
- Language barriers - Use interpreter
- Few diagnostic tools - Cardiac monitoring (AED)
- Inexperience with - Contact ground-based emergency care medical support
- Fear of liability - Documentation, obtain patient consent whenever possible
- Inexperienced cabin crew
- Limited examination facilities
- Unfamiliarity with equipment
- Intoxicated patients
- Airline carrier
- In-flight medical - Contact ground-based emergency medical support, flight diversion

The range of equipment and drugs on board vary substantially among airlines. The US Federal Aviation Administration (FAA) requires commercial aircraft weighing more than 3,400kg with minimal one flight attendant to carry an emergency medical kit with specified contents, e.g. aspirin, antihistamine, atropine, dextrose 50%, epinephrine, inhaled broncho-dilatator, lidocaine, nitroglycerine, non-narcotic analgesics, saline solution. Physicians are protected from liability in the US, Canada and the UK by Good Samaritan legislation(3,4). European nations obligate physicians to provide medical assistance when it is requested by the cabin crew(2).

Conclusion: Medical emergencies on board aircrafts inevitably will happen. Anaesthesiologists can be extremely important during in-flight emergencies. They should be aware of the legal protections offered and the equipment/drugs on board. We plea for a universal emergency kit.

References

1 Dowdall. "Is there a doctor on the aircraft?" Top 10 in-flight medical emergencies. *BMJ* 2000; **321**: 1336–7

2 Prout et al. Management of inflight medical emergencies on commercial airlines. www.uptodate.com

3 Sand et al. Surgical and medical emergencies on board European aircraft: a retrospective study of 10189 cases. *Critical Care* 2009, **13**No 1

4 Goodwin. In-flight medical emergencies: an overview. *BMJ* 2000; **321**: 1338–41

Paper No: 1187.0

Problem-oriented evidence: asymptomatic coronary patient in non-cardiac surgery plan what first? revascularization or surgery?

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Introduction: R.S. masculine, 68 years old, severe smoker, hypertensive, diabetic. Asymptomatic for anxiety and dyspnea; with mild ischemia in dobutamine test. In surgical plan for radical prostatectomy. In a surgery-anesthesiology conjoint athenaeum, the possibility of pre-surgical revascularization is discussed.

Objetives: Analyze randomized trials or meta-analysis about asymptomatic coronary patient in non-cardiac surgery.

Methods and Materials: POEMS (patient oriented evidence that matters). Search in Pubmed, Embase and Cochrane. Search criteria: prophylactic coronary revascularization, perioperative cardiovascular evaluation, revascularization prior surgery.

Results: Two randomized studies addressed the issue. CARP (Coronary Artery Revascularization Prophylaxis 2004) compared medical treatment vs. revascularization in 510 patients, without finding any significant differences in mortality or perioperative IAM [Acute Myocardial Infarction]. DECREASE-V (2007), recruited 430 patients with extensive ischemia, randomized in revascularization vs. non-revascularization (they all received b-blockers and ASA [Acetylsalicylic Acid]). No differences observed in mortality or IAM [Acute Myocardial Infarction]. Patients with severe ischemia induced by stress test with dobutamine were included. None of them recommends revascularization. The ESC/ESA (European Society of Cardiology/European Society of Anesthesiology) guide 2010 considers revascularization in surgery of high risk (IIb B recommendation). A meta-analysis covering the period of 1980-2006 (Wong et al) included 7 trials with N: 3.949. (1 randomized study: CARP and the rest retrospective), did not found significant differences for decease or IAM. The ACC/AHA guides (American College of Cardiology/American Heart Association) do not recommend the routine revascularization in cardiopathic asymptomatics.

Conclusions: The EOP constitutes a bibliographic search resource oriented to a problem of daily medical practice simple to use. It is important to analyze the obtained information in order to determine its kind and level of evidence. A surgery without complications (in non-revascularized patient) does not imply that the patient does not need revascularization. High risk patients in major surgery plan might revascularize after the surgery to avoid delaying the surgery. Although revascularization forms the ACA/AHA

algorithms; its use is based on exper's opinion. In the case of the patient, it was resolved to perform the surgery without previous revascularization and posterior derivation to cardiology for follow up.

References

1 Shaughnessy AF, Slawson DC, Bennett JH. Becoming an information master: a guidebook to the medical information jungle *J. Fam. Pract*. 1994; **39**: 489–99

2 Slawson DC, Shaghnessy AF. Obtaining useful information from expert based sourses. *BMJ* 1997; **314**: 947–9

3 Slawson DC, Shaghnessy AF. Teaching evidence-based medicine: should we be teaching information management instead?. *Acad. Med*. 2005; **80**7: 685–689

Paper No: 1191.0

Usefullness of stress echocardiography in perioperative evaluation of patients scheduled for non-cardiac surgery: a review

Gonzalo Valencia, Gabriel Canale, Ramiro Barolo, Pablo Gorosito and Diego García Picasso

Introduction: The need for assessment of the risk for developing cardiovascular events in patients scheduled for non-cardiac surgery (PSFNCS) is undeniable. In many cases it is not enough to rely on the patien's clinical features, and stress tests must be used in order to detect ischaemia. Stress Echocardiography (SE) rises as a useful tool, joining exercise testing (ET) and single-photon emission computed tomography (SPECT).
Objectives: To assess the usefulness of SE in PSFNCS, compared to that of ET and SPECT.
Methods and Materials: We conducted a throughout search in Medline and Ovid databases. Our keywords were "stress echocardiography", "perioperative evaluation" and "non-cardiac surgery". We took into account reviews, meta-analysis, and RCTs published between 2000 and 2011. We included in our work 6 selected articles.
Results and Discussion: Exercise is the prototype of ischaemic stress. However, many patients requiring a stress test cańt exercise, can exercise submaximally, or have an uninterpretable ECG[1]. Besides, with pharmacological stress testing factors such as hyperventilation, excessive chest wall movement and myocardial hypercontraction (which make echocardiographical assesment difficult and therefore reduce diagnostic accuracy) are avoided.[2] SE with either dobutamine or dypiridamole shows similar accuracy and sensibility. The choice of one test over the other will depend on patient characteristics, availability and physicians preferences.[3] Nevertheless, SE should be used as a first-line technique only when ET is uninterpretable (like in left bundle-branch block, or pacing).[4] The less informative and/or interpretable ET is, the higher is the level of appropriateness to SE [5]. On the other hand, it must be aknowledged that SE is recommended for high-risk patients with a previous history of coronary artery disease (CAD) sheduled for high-risk surgical procedures. The test is not recommended in low-to-medium-risk patients [6]. One of the tests with which SE has been compared to, is SPECT. According to many authors, SE should be chosen instead of SPECT, because of its lower costs and lack of radiation (SPECT radiation burden equals that of up to 1300 chest x-rays). [1]
Conclusions: SE's diagnostic and pronostic accuracy is similar to that of SPECT, at a lower cost, with no enviromental impact and avoiding exposure to radiation. Stress testing with SE is useful in patients for whom ET is not, and should only be used in that setting. Finally, we remark that SE is useful for high surgical risk patients, with known CAD.

References

1 Sicari R *et al. European Journal of Echocardiography* (2008) **9**, 415–437

2 Sicari R. *Cardiovascular Ultrasound* 2004, **2:4**

3 Fleischer LA *et al. J. Am. Coll. Cardiol*. 2009; **54**;e13–e118

4 Picano E *et al. Cardiovascular Ultrasound* 2008, **6**: 30

5 Chassot PG *et al. Br J Anaesth* 2002; **89**: 747–59

6 Boersma E *et al. JAMA* 2001; **285**: 1865–73

Paper No: 1204.0

Lagos State doctors' attitude towards informed consent: a cross sectional study

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Introduction: Informed consent has become a pillar in the surgical management of patients. This importance is being emphasized and embraced in developing countries like Nigeria. There is a dearth of scientific data elucidating the attitude of doctors to this important aspect of patient management. This lack of data is further pronounced in resource poor environment like ours. In this study, we sort to investigate the attitude of doctors to issues concerning informed consent in Lagos, Nigeria.
Objectives: To determine the attitude of medical doctors towards informed consent.
Methods: A questionnaire made up of 35 statements addressing issues concerning the process of consent for anaesthesia and surgery was distributed to randomly selected doctors working in the 26 local government hospitals in Lagos State, Nigeria in May 2011. Questions were structured to evaluate to what extent they agreed with statements regarding consent.
Results: Eighty five percent (170/200) of distributed questionnaires were returned of which 136(68%) were duly filled out and analyzed. 92.6% of the respondents considered that providing the doctor with greater protection against

medical litigation was the main purpose of consent. The highest agreement among respondent (77.2%) as the reason for inappropriateness of consent was the notion that "Most patients trust their doctor to decide what is best for them". What the procedure entails(94.9%) as well as what it aims to achieve(94.9%) were thought of as the most important details to be discussed with the patient during the process of informed consent- only 75% of respondents thought that the doctor should explain the possibility of death(if present). 86.8% of the respondents agreed that age of the patient should not be a significant determinant as regards the amount of information to be discussed.

Conclusions: The study revealed that the possibility of litigation weighs heavily on most respondents' minds as a major reason for consent form administration and quite a substantial proportion of doctors still hold paternalistic views about the process. Hence, this survey underlines the need for further information and training in this issue.

Paper No: 1207.0

Effect of Hydroxyethyl Starch 6% (130/0.4) which is a Colloid Solution on Blood Glucose

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Introduction: Hydroxyethyl Starch (HES) 6% (130/0.4) solutions are widely used in clinical practice. This solution has quite long half-life and most of HES particles were held by reticuloendothelial system. It was catabolized by sucrose-isomaltase complex.1 These features of HES solutions could influence the blood glucose level.

Objective: We aimed to investigate the effect of HES 6% (130/0.4) solution on blood glucose level in patients who received a standard type of anesthesia and surgery.

Methods: After Ethics Committee approval and informed consent sixty non-diabetic patients (age 18-75, ASA I-II) scheduled for elective surgery under spinal anesthesia were included in this study. Patients were randomly divided into two groups: Group HES and Group S. Thirty min before spinal anesthesia, fluid infusion was administered to the patients for preloading according to study groups. The patients received 500 ml (HES) 6% (130/0.4) solution in group HES and 1000 ml 0.9% NaCl solution in group S. Capillary blood sugar measurements using a regularly calibrated standard blood sugar measurement instrument were done before infusion of the fluids (T1), immediately after the infusion (T2), 45 min, 6 h and 12 h after the infusion (T3, T4, T5). Mean blood pressure(MBP), heart rate(HR) and peripheric oxygen saturation (SpO2) were recorded at mentioned measurement periods. Spinal anesthesia using 25G Quincke spinal needle and 12.5 mg 0.5% hyperbaric bupivacaine was applied to all prehydrated patients at the left lateral position, through L3-4 or L4-5 intervertebral spaces. The duration of anesthesia and surgery, and complications were recorded.

Results: ASA classification, gender, age, duration of surgery and anesthesia were not significant between the groups ($p>0.05$). Blood sugar levels were higher in group HES at all measurement times($p<0.001$, $p<0.01$, $p<0.001$, $p<0.01$, respectively) but in group S it was only higher 6 h after infusion ($p<0.05$) compared to the values before infusion. At 6th h after infusion, there was a significant difference in blood glucose level between the groups ($p<0.001$).

Discussion and Conclusion: This study showed that blood sugar levels were higher in patient who have infusion of 500 ml (HES) 6% (130/0.4) solution. Infusion of HES 6% (130/0.4) solution altered blood sugar levels of the patients. Six h after HES 6% (130/0.4) infusion, blood sugar was at the highest level. These findings could be carefully taken into consideration in patients whose blood sugar level measuremet is important.

Reference

1 Hulse JD, Yacohi A. Hetastarch: an overview of the colloid and its metabolism. *Drug Intell Clin Pharm* 1983; **17**: 334–41

Paper No: 1211.0

Incidence of silent regurgitation and aspirationin patients receving general anesthesiafor upper abdominal surgeries

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Introduction and objectives: Pulmonary aspiration can be a lethal complication of anesthesia.The incidence of aspiration is about 1 in 3000 cases of anesthesia and it is the main cause of 10 to 30 percent of anesthesia- related deaths. The aim of this study is to determine the incidence of silent regurgitation in patients undergoing general anesthesia for upper abdominal surgeries.

Methods: Considering inclusion criteria, we studied 105 adult patients in hospitals of ShahidBeheshti Medical University who were scheduled for elective upper abdominal operations.Inthis study we measured PH of oral cavity secretions before anesthesia and then measured the ph of secretions over and under the cuff of tracheal tubesafter extubation of these patients. The cuff pressure in all patients is same and measured by same type of barometers. PH less than 5 regarded as acidotic, and higher than 7.5 as alkaline, in this study.PH between 5-7.5 assumed as normal values for pharyngeal secrations.

Results: In our research we did not find any patient out of normal range we assumed, before starting anesthesia but after that 36 patients had pH higher than 7.5 in their oral cavity and among them, in 26 percent of the patients we

detected the same pH of secretions below tracheal tube cuffs.
Conclusion: Despite intubating trachea with high volume low pressure inflated cuffs, the cuffs could not protect airway from passage of oral cavity secretions to trachea. In 75 percent of patients who had abnormal PH of their oral cavity secretion, we could detect the same PH of secretion below their tracheal tube cuffs. Although in this study, we could not find any acid regurgitation but we realized the high incidence of passage of secretions through the tracheal tube cuffs. Therefore, in our study we showed the incompetency of the cuffs of high volume low pressure tracheal tubes we used in our hospitals,for protecting airway.

Refrences

1 Benington S, Seven A, Preventing aspitration and regurgitation, *Anesthesia and intensive care med* (2007)
2 Marik PE, Aspiration pneumonia and aspiration *New england journal of medicine* 2001 no 344 pp 665–771
3 Asai T, shingu K Should mendelsons syndrom be renamed? *Anesthesia* 2001 n 56 pp 398–9

Paper No: 1219.0

Brachial plexus nerve block with blind techniques: a retrospective study

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Introduction: Regional anesthetic techniques have been driven by the popularization of methods used for locating peripheral nerves, particularly by ultrasound. These techniques provide high accuracy and significantly increase the safety of the procedures. However, the equipment is still considered expensive and impractical, often seen as superfluous, limiting its availability, especially in hospitals with limited financial resources.
Objectives: To evaluate the experience of our service, which does not yet have an imaging method and only recently standardized the supply of insulated needles in brachial plexus nerve block with blind techniques.
Methods: In this retrospective observational study we analyzed 112 reports of anesthesia of patients undergoing blind techniques for brachial plexus block in our hospital over a period of two years (2009-2010), by three different evaluators, to determine by consensus, the failure indices, combined anesthesia and successful anesthesia. The inclusion criterion was anesthesia for brachial plexus block. The exclusion criteria were: brachial plexus anesthesia combined with general anesthesia, the use of neurostimulation for the location of peripheral nerve associated with use of any block of the territory innervated by branches of brachial plexus anesthesia or by any other technique.
Results: The exclusion criteria were withdrawn from study 18 cases of brachial plexus blocking combined with general anesthesia before and 02 cases that used electrical stimulation to locate the peripheral nerve. Of the remaining 92 cases, 38 (41.30%) had satisfactory for blocking this type of surgery alone or accompanied by intravenous sedation. In 54 cases (58.70%) totally failed or part of the brachial plexus block with the need for other anesthetic techniques to allow for surgery.
Conclusion: This study shows the reality of a service with a small number of brachial plexus blocks without propaedeutic options in place for the localization of the nerves. The comparison with literature data suggests that the use of electrical stimulation and ultrasound can be even more relevant in hospitals with a low numbers of blocks increasing the accuracy of regional techniques, reducing the chance of iatrogenic diseases, improving the quality of patient care and decreasing costs directly related to anesthesia.

References

1 *Rev Bras Anestesiol* 2009, **59**: 585–591
2 *Anesth Analg* 2009; **109**: 265–271

Paper No: 1231.0

Comparison between MgSo4 and lidicain interavenously on hemodynamic changes after laryngoscopy and tracheal intubation

Masih Ebrahimy Dehkordy, Navid Nouraee, Shayesteh Khorasanizadeh and Homeyra kozekanany

Introduction: It has been clearly known that laryngoscopy and tracheal intubation induces marked variation in heart rate, blood pressure and pulmonary capillary wedge pressure.Anesthesiologists try to find the ways for preventing occurrences of these undesirable effects.Intravenous MgSo4 has been suggested for attenuating these unfavorable events.
Objectives: This study has been designed to compare lidocaine and MgSo4 in attenuation of unwanted hemodynamic responses following intubation in patients who underwent elective surgery.
Methods: This randomized double blind trial was done on sixty ASA class 1 or 2 patients.We randomly used lidocaine or MgSo4 for patients.Blood pressure,heart rate were recorded in two groups in five minutes after intubation.
Results: Our study showed that systolic blood pressure increased in both groups but this increase in BP for lidocaine group after three minutes started to attenuate mean while in MgSo4 group, this increase after intubation attenuate during

one minute.p=0.011 Diastolic blood pressure increased after intubation in both groups but there was not any statistically distinguishable effects in both groups.p>0.05. Mean arterial pressure increased in both groups after intubation but if we consider returning time to basic values, in lidocaine group within two minutes and in MgSo4 within one minute this elevation were returned to its basic values<0.05. Heart rate increased in both groups after intubation but in lidocaine group attenuation accrued between two minutes but in MgSo4 group it happens in four minutes.

Conclusion: Both lidocaine and MgSo4 has been suggested for attenuating undesirable effects of laryngoscopy and tracheal intubation. Although many advantages has been reported for each drug, but in attenuation of heart rate changes and mean arterial pressure these two drugs are different. For decreasing heart rate, MgSo4 needs more time for its action.In the contrary, Mgso4 has slightly faster attenuation effects for retuning mean arterial pressure and systolic blood pressure changes to basic values.

Paper No: 1239.0

The effects of preanesthetic, different two single-doses dexmedetomidine on the onset time of rocuronium

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Introduction: Dexmedetomidine, a highly selective ?2-agonist, has been used in the perioperative period and in intensive care because of its sedative, analgesic, and anaesthetic-sparing and haemodynamic-stabilising effects (1). However, the effect of dexmedetomidine on the action of non-depolarizing neuromuscular blocking drugs has not been extensively studied (2).

Objectives: We evaluated that the effect of different two doses of dexmedetomidine given before induction on onset of rocuronium-induced neuromuscular block.

Methods: After obtaining Ethics Committee's approval and written informed consents, 75 ASA I-II patients were randomly divided into 3 groups (n=25 for each): the first group received dexmedetomidine 0.5 μg/kg (Group D1), the second group received dexmedetomidine 1 μg/kg (Group D2), and the third group received physiologic saline (Group S) before induction of anesthesia. Rocuronium 0.6 mg/kg was administered during propofol/fentanyl induction. Anesthesia was maintained sevoflurane/nitrous oxide. The neuromuscular block was monitored by electromyography.

Results: Both dexmedetomidine 0.5 μg/kg and 1 μg/kg decreased onset time (77.8?19.3 in group D1, 83.9?33.9 in group D2 vs 108.7?35.8 in group S, p<0.01, p<0.01, respectively), but increased recovery index (26.7?14.6 in group D1, 30.7?14.7 in group D2 vs 16.9?8.9 in group S, p<0.01 and p<0.001, respectively). The clinical duration was longer in the group D2 than the group S (60.1?12.0 vs 49.8?16.6, p<0.05).

Discussion and Conclusions: The administration of preanesthetic, both dexmedetomidine 0.5 μg/kg and 1 μg/kg before propofol /fentanyl induction was shown to improve the intubating conditions provided by rocuronium 0.6 mg/kg and to decrease its onset time but to prolong clinical duration.

References

1 Gurbet A, Basagan-Mogol E, Turker G, Ugun F, Kaya FN, Ozcan B. Intraoperative infusion of dexmedetomidine reduces perioperative analgesic requirements. *Can J Anaesth* 2006; **53**: 646–52

2 Talke PO, Caldwell JE, Richardson CA, Kirkegaard-Nielsen H, Stafford M. The effects of dexmedetomidine on neuromuscular blockade in human volunteers. *Anesth Analg* 1999; **88**: 633–9

Paper No: 1253.0

Surgical site infections in head and neck surgery – role of anesthesiologist

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Introduction: The surgical site infection (SSI) is the most common complication in head and neck surgery (HNS) and its incidence ranges from 10 to 45%. The patient who develops SSI has a higher rate of mortality and morbidity, with prolonged hospitalization, delayed healing, poor cosmetic results, delay the start of radiotherapy and has 60% more likely to be in ICU and being re-hospitalized(1)(3).

Objectives: We did a literature review with the aim of identifying risk factors, preventive measures to optimize the anaesthetic approach and proper management of antibiotic therapy in HNS.

Methods: The PubMed was searched for relevant papers.

Results: SSI is the most frequent and most feared complication of HNS(2). In scientific literature we identified several risk factors for SSI in HNS, but they vary from study to study and there is no clear definition of risk groups. As major risk factors were identified: malnutrition, smoking, chemotherapy, stage 3/4 disease, lymph node invasion, long hospitalization, tracheotomy, surgical contamination, flap reconstruction and surgery more than 9 hours. There are just general guidelines for prevention of SSI; those who have level of evidence IA are: using immune-modulating nutrition support, treating infections, and maintain normothermia; and those with level of evidence IB are: intraoperative glucose levels between 80-120mg/dl, stop smoking at least 30 days before surgery

and protect all wounds with sterile think. The prophylactic antibiotic (PA) regimen should be decided by the institution based on the most commons microorganisms, that are usually E.coli, coagulase negative St., non hemolytic Str. and St. aureus(2). Cefazolin, clindamycin and gentamicin usually are a good choice. The PA therapy should be ideally administered 30-60 minutes before incision and maintained for 24 hours.

Conclusion: The anaesthesiologist can take some preventive measures to help decrease the incidence of SSI in HNS: during the pre-anaesthetic consultation should encourage the patient to stop smoking; in the perioperative period should supervise the administration of PA at the right time, maintain normoglycemia and normothermia. We should try to optimize the anaesthetic and surgical approach in order to minimize the incidence of SSI in HNS.

References

1 *Anestesiology* 2006; **105**: 413–21
2 Penel N *et al. Oral Oncology* 2005; **41**: 294–303
3 *Epidemiology* 1999; **20**;4: 241–76

Paper No: 1260.0

Prophylactic use of tranexamic acid and e-aminocaproic acid in heart surgery

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Introduction: Prophylactic pharmacological treatment of intraoperative bleeding in heart surgery with extracorporeal circulation has been changed to tranexamic acid since antifibrinolytic therapy with Aprotinin has been withdrawn from the market. Objective : The purpose of this study was to compare the efficacy of medium Tranexamic acid (TA) and å-Aminocaproic acid (EACA) dosages in the prophylaxis of excessive bleeding in heart surgery. Material and

Methods: Perioperative data of 163 consecutive patients undergoing cardiac surgery with cardiopulmonary bypass were retrospectively reviewed from February 2011 to July 2011. TA (n=79) received a bolus of 20 mg/kg following anesthetic induction, 20 mg/k g in the pump priming and a continuous infusion of 5 mg/kg/h during 5 h. EACA (n=84) received a bolus of 70 mg/kg and a continuous infusion of 30 mg/kg/h and is continued postoperatively until 2 controls without bleeding. Preoperative, intraoperative and postoperative variables were comparable between the prophylactic hemostasis groups. Student t test, and chi-squared test were used as appropriate.

Results: There was a similar distribution of type of surgery in both groups. Six patients had undergone preoperative surgery: 5 patients (6.3%) in TA and 1 patient (1.1%) in EACA (NS). The 24-hour postoperative bleeding was not statistically different between TA and EACA (473 ± 414 ml vs 436 ± 250 ml). Postoperative allogeneic blood transfusion requirements were lower in TA than in EACA: 29 patients (36.7%) vs. 49 patients (58.3%) ($p<0.01$). Hypovolemic shock which developed in 13 patients was significantly greater in EACA: 11 patients (13%) vs. 2 patients (2.5%) in TA ($p<0.02$). Cardiogenic shock with preserved ventricular function occurred in 7 patients: 6 patients (7.1%) in EACA vs. 1 patient (1.3%) in TA (NS). Intraaortic balloon pump counterpulsation was performed in 12 patients: 3 patients (3.6%) in EACA vs. 9 patients (11.4%) in TA (NS). Re-do surgery for bleeding was necessary in 5 patients: 3.6 % (3 pts) in EACA vs. 2.5 % (2 patients) in TA (NS). Zeizures occurred in 3 patients (3.8%), all in TA (NS) and stroke in 5 patients: 1.2% (1 pt) in EACA vs. 5% (4 pts) in TA (NS). Intrahospital mortality occurred in 4 patients (3 of which were very high risk patients), all in TA (5%) ($p<0.05$).

Conclusion: TA and EACA are equally efficient in prophylactic control of bleeding with lower postoperative allogenic blood requirements in TA. Future randomized studies are needed to analyze death incidence with TA.

Reference

1 *Martin K, Wiesner G, Breuer T, Lange R, Tassani P. The risks of aprotinin and tranexamic acid in cardiac surgery: a one-year follow-up of 1188 consecutive patients. Cardiovasc Anesth* 2008; **106**: 1783–90

Paper No: 1261.0

Transcatheter aortic valve implantation

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Introduction: In high surgical risk patients with severe aortic stenosis, biotechnological development allows transcatheter aortic valve implantation (TAVI) improving survival and quality of life.

Objective: The aim of this study was to describe preliminary TAVI results in patients with severe aortic stenosis excluded from surgery due to their high risk condition.

Material and Methods: Preopreative, intraoperative and post-operative variables in 33 patients with aortic stenosis undergoing TAVI were analyzed from March 2009 to July 2011 using the hospital data base prospectively collected. Procedure: All patients received general anesthesia without premedication, receiving induction with propofol with previous titration and optional fentanyl (50 μg), maintaining with remifentanyl (0.1 to 0.2 μg /kg/min), proprofol (0.04 mg/kg/min). Non-depolarizing muscle relaxant was optional. Preload and arterial pressure vasopressors were optimized before and during valvuloplasty or TAVI. Peripheral venous accesses were prepared for volume expansion and endovenous anesthesia administration and a radial catheter

for invasive arterial monitoring. Two central venous accesses (jugular and femoral) were used for transient pacemaker and Swan Ganz catheter implantation. In all cases, angio-fluoro and transesophageal echocardiography were used for valve implantation guidance, except in one patient with previous esophageal stenosis. Valve implantation was done by retrograde approach in all cases (29 transfemoral and 1 subclavian), and direct valve implantation was used in 22 cases.
Results: Mean age 79.5 ± 7.95 years (61 – 92); Logistic Euroscore: 19.5 ± 14; Symptoms: Angor: 6 (18.1%); Dyspnea: 32 (97%); Syncope: 4 (12.1%); Atrial fibrillation: 6 (18.1%); Diabetes: 9 (27,2%); Dyslipidemia 18 (54.5%); Arterial hypertension 26 p (78,7%); History of heart failure 6 (18,1%), functional class: III-IV 20 (62%); Previous myocardial revascularization surgery 6 (18%); Chronic renal failure 7 (21,2%). Preoperative Doppler evaluation: peak gradient: 77.7 ± 21.5; mean gradient: 48.4 ± 11.56); left ventricular ejection fraction 52 ± 12,45%. TAVI successful implantation was achieved in all cases. Complications: Pacemaker implantation 9 (29,7%). 30-day mortality: 3.3% (1 patient intraprocedure due to mechanical dissociation) and intrahospital stay: 7.5 days ± 12.
Conclusions: TAVI was feasible and safe in this high risk population. All patients tolerated well anesthesia and blood pressure control was the most difficult part for the anesthesiologist.
Covello RD, Landoni G, Zangrillo A. Anesthetic management of transcatheter aortic valve implantation. Curr Op Anesthesiol 24: 417–425, 2011.

Paper No: 1263.0

Intraoperative hemodynamic predictors in the surgical treatment of the chronic thromboembolic pulmonary hypertension

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Introduction: Patients with chronic thromboembolic pulmonary hypertension (CTEPH) are characterized by right ventricular (RV) dilation and severe systolic dysfunction, partly expressed as increased stroke work due to elevated afterload.
Objective: To determine the immediate impact of pulmonary endarterectomy (PE) on RV, stroke work index (RVSWI) and its correlation with other preoperative hemodynamic parameters. Material and
Methods: Between 11/1992 and 8/2010, 41 consecutive patients (23 male, 56%) underwent PE alone or combined with other surgical procedures. Mean age was 45 ± 13 years. Preoperative NYHA Functional Class (FC) was III-IV (90%). Pre and postoperative hemodynamic variables were analyzed in the operating room (OR) and changes were assesed with the "t" test for paired samples. The relationship between RVSWI Improvement (IMP) due to PE (IMP= RVSWIpre – RVSWIpost) and preoperative parameters were analysed to determine the best preoperative estimation of the surgical outcome.
Results: After PE, a significant decrease ($p<0.01$) was observed in PAPm (57 ± 17 vs. 31 ± 11 mmHg), total pulmonary vascular resistance (TPVR) (1207 ± 405 vs. 447 ± 231 dyne-s/cm5) and RVSWI (18.5 ± 9.0 vs 10.5 ± 4.6 gr-m/m2). The linear adjust between IMP and mean preoperative pulmonary arterial pressure (PAPmpre) resulted in a linear correlation coefficient equal to R=0.75, between IMP and preoperative cardiac index (CIpre) in R=0.74, and between IMP and preoperative RVSWI (RVSWIpre) in R=0.91 (all with $p<0.01$). The comparison among correlation coefficients gave statistically significant differences ($p<0.005$ after Z transformation, ÷2=11.04). The correlation coefficient between IMP and RVSWIpre also had the lower standard error of the estimate, with a value of 4.64 gm-m/m2 in compared with 7.32 for PAPmpre and 7.50 for CIpre.
Conclusion: RVSWI is a reliable intraoperative marker of RV performance, and its improvement (IMP) due to PE is better estimated through RVSWIpre, even though PAPmpre and CIpre can be used with the same purpose due to their acceptable correlation coefficients.

Paper No: 1266.0

Prediction of mortality after infective endocarditis surgery: comparison of five scoring systems

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Introduction: The risk assessment for surgically treated infective endocarditis is complex. A new simplified risk scoring system (SRSS) developed by the STS (Society of Thoracic Surgeons) has been validated for estimate the risk of death in patients operated for infective endocarditis (1). The purpose of this study is to compare the predictive value of in-hospital mortality after cardiac surgery for infective endocarditis using the additive EuroSCORE, Logistic EuroSCORE, Logistic System 97, Ontario Province Risk (OPR) and SRSS. Materiel and methods : This retrospective study. We included patients who underwent surgery for infective endocarditis during the period 1 January 2000 to 31 December 2010.The additive EuroSCORE, logistic EuroSCORE, logistic System 97 (2), OPR (3) and SRSS were calculated. Statistical Analysis: The assessment of the association of scores with mortality was made by the Mann-Whitney. The performance

of scores with an association with mortality been studied by the discriminating power (AUC ROC).
Results: Forty patients were included. We analyzed 41 episodes of infective endocarditis operated. The Mortality was 19%. The median of the logistic system 97 and SRSS were significantly lower in survivors than the deads, respectively [6.2 (interquartile range: 2.8 to 14) vs 27.8 (17.2 to 48.1), p=0.01] and [25 (16-33) vs. 35 (26-51), p=0.02]. The additive EuroSCORE Logisitic EuroSCORE the OPR and the score were not associated with mortality (p> 0.05). The area under the ROC curve was 0.87 for the logistic score System 97 and 0.76 for the SRSS. There was no significant difference between the AUC of ROC curves of logistic System 97 and SRSS (p=0.48). The ROC curve has shown that threshold 16, the logistic predicted mortality System 97 with a sensitivity (Se) of 86% and specificity (Sp) of 79% with an odds ratio of 21 (confidence interval [2.2 to 208.84]). The threshold score 24 for the SRSS had best couple "Se-Sp" with a 100% Se and Sp of 48.5%.
Discussion: Logistic System 97 and SRSS were used to predict hospital mortality in our study. The prognostic scores can help the selection of patients for surgery, management of hospital resources and comparison of studies in infective endocarditis.

References

1 *J Thorac Cardiovasc Surg* 2011; **141**: 98–106
2 *Ann Thorac Surg*. 2000; **69**: 823–8
3 *Circulation*. 1995; **91**: 677–84

Paper No: 1271.0

Airway anaesthetic management with AIRTRAQ® laryngoscope of 40 morbidly obese patients undergoing laparoscopic bariatric surgery

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Introduction: Difficult airway management is one of the identifyng characteristics of the anaesthesioly. Obese population are in continuous risk of airway complications when anaesthesia is administered.
Objectives: Laparoscopic bariatric surgery is a challenge for anaesthesiologists because morbidly obese patients are at high risk. There is strong evidence that difficult airway management is more prevalent in morbidity obese patients than in regular population. The aim of this study was to analyze the real incidence of difficult airway management of a morbidly obese patients series using AIRTRAQ® laryngoscope and develop the role of the AIRTRAQ laryngoscope in a modified Airway algorithm adapted to obese population.
Material and methods: Prospective study of 40 consecutive patients diagnosed with morbid obesity and scheduled for laparoscopic bariatric surgery. After preanaesthesic consultation and exhaustive airway evaluation patients were enroled to the study. Patients were positioned with a wedge cushion under the head and shoulders. Midazolam was used as premedication. A target controlled infusion of propofol and remifentanil at low doses was established to maintain spontaneous ventilation. An AIRTRAQ laryngoscope, was used for intubation. Cormack Lehane view, time to intubation, ease of introduction of the oral tube were recorded. Bronchoscope and difficult airway cart were on hand within rescue devices.
Results: Ninety percent of the patients were women with a mean (SD) body mass index (kg/m2) of 46. One hundred percent of the patients had one difficult airway predictor at least. All patients were successfully intubated at the first attempt in less than thirty seconds. Only two patients required the use of Frova stylet to ease the intubation. No respiratory complications were recorded.
Conclusions: Airway management of morbidly obese patients is a continuous challenge not only for the increased prevalence of difficult airway but for the usual difficulty to ventilate patients manually. To minimize complications, preoxygenation, optimized position of the patient, rigorous exploration of the airway should be performed correctly. New devices as AIRTRAQ laryngoscope can help us to ease orotracheal intubation and demonstrate its safeness in the obese patients.

References

1 Domínguez-Cherit G, Gonzalez R, Borunda D, Pedroza J, Gonzalez-Barranco J, Herrera MF, *et al.* Anesthesia for Morbidly Obese Patients. *World J Surg*. 1998; **22**: 969–73
2 Reed AP. Evaluation and recognition of the difficult airway. En: Hagberg Carin A., editors. *Benumof's airway management: Principles and practice*. Philadelphia: Mosby Elsevier; 2007. pp. 221–35
3 Binks A, Pyke M. Anaesthesia in the obese patient. *Anaesth Intensive Care*. 2008; **9**:7: 299–302

Paper No: 1273.0

Protocol for Anesthesia to Bariatric surgery: the outecome of 915 cases

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Introduction: In recent years the surgical treatment of Morbid obesity (MO) has been increasing membership in the scientific community. MO brings many pathophysiology systemic changes, so these patients will benefit from a multidisciplinary assessment. In 2003 and with the development of a Centre for Bariatric Surgery at the Hospital São

Sebastião, it was created a multidisciplinary perioperative team for the obese patients. In this context the Anesthesiology Department developed a protocol approach for the patient with MO, which has been strictly applied in an attempt to reduce morbidity and mortality of these patients.
Description: We analyzed a data base of 915 patients. All passed by the preoperative appointment for stratification of cardiovascular, respiratory and metabolic risk. In this consultation was also evaluated the airway and programmed handling of ventilation in postoperative setting (noninvasive and invasive ventilation). Based on this data set, an anesthetic protocol was developed through perioperative period in order to reduce the major complications of this particular group of patients.
Results: Mean age (years): 39 (18-67);Sex: Male-767,Female-184; Weight(Kg):115,3 (77-203); IMC(Kg/m2): 45,84 (34-75); ASA classification: II-522, III-338, IV-55; Mean neck circumference: 42 cm (+ ou −12; Difficult airway criteria-292. Type of procedure: Gastric bypass-91%, Adjustable gastric band-6% Gastrectomy-band-3%. Intubation resolved with laringoscopy-728; Intubation resolved with videolaringoscopy (GlidescopeTM)-187; Residual curarization-5;BIPAP/VNI in recovery area-430; Invasive ventilation in Intensive area on postoperative period-7; Pulmonary atelectasy postoperative-6; Early surgical morbidity (Anastomotic dehiscence, intra-abdominal abscess, fistula)-59; Severe late surgical morbidity(Anastomotic stenosis, occlusion)-25; Overall mortality-4; Mortality related to anesthesia-0.
Conclusion: We conclude that the comprehensive assessment, risk stratification and the existence of a specific anesthetic regimen appears to contribute to a low morbidity and mortality related with perioperative anesthesia care in Bariatric Surgery.

Paper No: 1274.0

Case study series of post-anesthesia eye injury

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Introduction: In surgical and anesthetic procedures, the anesthesiologist stands out as an instrument for injury prevention. The eye complaints are not unusual, though often undervalued, impairing not only physical and functional to patients, such as economic and legal charges to responsible, so prevention becomes critical.
Objectives: To describe the epidemiological characteristics of patients, the main types of eye injuries, considering the use of eye protection, and identify possible risk factors inherent in surgery and anesthetic that can be correlated.
Methods: The cases of eye complaints were selected quality indicators of patients at a private hospital in São Paulo from January 2007 to December 2010. Data were tabulated and analyzed frequencies against the total sample.
Results: During 39,431 surgical procedures were performed, with nine reported cases, ie, an incidence of 2.3: 10,000. Six male and three females, age 58.9 ± 19.5 years. Classified as ASA I (33.3%), ASA II (55.6%) and ASA III (11.1%). A surgery was urgent and 8, electives. Intravenous general anesthesia was used in 4 cases, 4 cases and balanced in a case of use of regional block associated with general anesthesia. Five (55.6%) patients were placed in the supine position, one (11.1%) in the lithotomy position, two (22.2%) in the prone position and one (11.1%) in lateral. All patients were given eye and occlusion in 5 cases added lubricating eye. Of ocular signs and symptoms, all had red eye, 55.6% (5 / 9), pain / burning eyes, 11.2% (1 / 9), visual impairment, 11.2% (1 / 9) ocular discharge and 11.2% (ninth), photophobia. Four patients were followed by ophthalmology, and diagnoses relevant to exposure keratitis and corneal scarification, there was no period in case of permanent injury.
Conclusions: Understanding the risk factors and characteristics that predispose the occurrence of eye injury during surgery is of paramount importance for prevention strategies are developed. Despite an apparently low incidence of such complications, the potential for serious and permanent injury, such as retinal ischemia, among others, justify the care and active search for quality services in anesthesia. Although our study ratifies the literature data, There are few guidelines that serve as reference to guide the eye protection practices taking into account the differences between positioning, surgical time, patient's physical status, among other aspects, therefore, a vast field of research.

References

1 Roth S *et al.* Eye Injuries after nonocular surgery - A Study of 60.965 anesthetic from 1988 to 1992. *Anesthesiology* 1996, **85**;5: 1020–1026
2 Martin D *et al.* Performance Improvement system and postoperative corneal injuries Incidence and risk factors. *Anesthesiology* 2009, **111**;2: 320–326

Paper No: 1286.0

Taking care of surgical patients as a team in the process for international accreditation of a tertiary hospital in Brazil

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Introduction: Accreditation is composed of external evaluation focused on health services using performance standards aimed at the processes of patient care and management of services. The institution is assessed for compliance with these standards established and before its fulfillment receives your certification. For the Canadian International Accreditation is necessary to develop a manual with international standards of excellence, whose primary focus is the safety of care provided to patients. Assistance teams are created for program development. They are groups of people who work with the aim of adapting international standards to the hospital reality, respecting rigid rules.
Objective: Implement medical flowchart to surgical patients to ensure safe care.
Methods: Among the health care team, the Surgical Patients Team was composed by professionals involved in all the process, including anesthesiologists and surgeons, nurses, pharmacists and administrative managers. A schedule of activities involving all the way of care was established, including the admission, stay and discharge of the patients in a safe goal.
Results: With the actions for standard cares the team got the operating theater reservation by web with careful description of therapeutical plans and patientś comorbidity. They increased the number of pre-anesthetic consultation, implemented the informed consent, started the drugs reconciliation to maintain the pharmacological drugs used at home, expanded the use of antibioticprophylaxis 30 minutes before surgery, including right doses and right drugs, implemented safe surgery checklist for all surgical procedures, created a protocol for the treatment of postoperative pain, established a thromboembolism prophylaxis protocol for all eligible patients and started a homecare prescription in a multidisciplinary approach.
Conclusions: To ensure safety and quality of care is a big challenge, but we noted that teamwork can reach that goal. The strategy focuses on organization, layout and vision care as a team.

References

1 *Surgeon*. 2004; **2**(6): 321–6
2 *JAMC*. 2004; **170** (11): 1678–86

Paper No: 1287.0

Improvement of venous thromboembolism prophylaxis in hospitalized patients after a protocol and educational program implementation

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Purpose: To evaluate the results of educational interventions (lectures, folders and brochures) in the venous thromboembolism (VTE) prophylaxis in hospitalized patients at Hospital Meridional, Brazil.
Methods: The appropriateness of VTE thromboprophylaxis was determined based on ACCP recommendations in hospitalized patients (medical and surgical) before the educational program (conferences, folders and brochures) to the medical and nurse staffs. We reviewed during november 2010 to july 2011 records of 684 inpatients (medical and surgical) including elective and critical patients to determinate if there was adherence and effectiveness after the begining of VTE thromboprophylaxis in all hospital.
Results: After the educational program we had 95,22% of protocol adherence in surgical, clinical and neurological patients and 96,63% of protocol adherence in critical patients, both with correct VTE thromboprophylaxis (ACCP recomendations). The effectiveness to prevent VTE during hospitalization till the 30th day after discharge was 100% for neurological patients, 98,98% for clinical patients and 98,96% for surgical patients.
Conclusion: Although use of prophylaxis is accepted,its incorporation into clinical practice is not so easy. An educational program can improve the adherence to VTE prophylaxis guidelines and decrease one of the most important preventable cause of morbility and mortality in hospitalized patients.

Paper No: 1289.0

Vocal cord paralysis and tracheal stenosis - anaesthetic approach for pulmonary lobectomy

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Introduction: Bilateral vocal cord paralysis is currently an infrequent complication of thyroid surgery(1). Its consequences range from dysphonia, hoarseness, stridor, dyspnea and respiratory failure requiring tracheostomy.
Objectives: We report the anaesthetic approach and complications of right upper pulmonary lobectomy performed in a patient with unilateral vocal cord paralysis post-thyroidectomy and tracheal stenosis post-tracheostomy.
Methods: Female patient, 36 years old, physical status ASA II was submitted to pulmonary lobectomy. She was premedicated with midazolam and hydrocortisone. General anaesthesia was induced with propofol, fentanil and rocuronium

and the patient was intubated with a left double lumen endotracheal tube 35Fr. The correct position of the tube was confirmed with bronchofibroscopy. Anaesthesia was maintained with sevoflurane, fentanil and rocuronium. After surgery an epidural cateter 20G was inserted at level T7-T8 for postoperative analgesia.

Results: The anaesthetic induction and maintenance had no complications. Laryngoscopy was classified as grade 1 (Cormack Lehane) and there was no difficulty in the insertion and advancement of the endotracheal tube. The patient was extubated after reversal of neuromuscular block, with effective analgesia and no respiratory distress. During emergency and after extubation the patient developed bronchospasm and laryngospasm that required re-intubation with a cuffed endotracheal tube 7,5mm. After a few minutes there was a reversal of symptoms. The patient was transferred to the intensive care unit and extubated 4 days later.

Conclusion: The patient had bilateral vocal cord paralysis caused by total thyroidectomy procedure, so she was then tracheostomized during 1 year. Then she underwent surgery that gave her the mobility of one of the cords. However, she developed permanent hoarseness and stridor related with episodes of stress. Now she has stenosis of the trachea in about 1cm, as a consequence of the tracheostomy, as showed by bronchofibroscopy. In spite of these alterations it was possible the introduction of a 35Fr double-lumen endotracheal tube without any difficulty. Although an induction and maintenance without complications, the endotracheal tube was probably the cause of the laringo and bronchospasm after the extubation, a detail that could not be avoided. In this case its extremely important a proper assessment of the airway, preparation of material for possible difficult intubation and intensive care unit available for the patient.

Reference

1 *Rev Bras Cir Cab Pesc* (2003) **32** (3), 31–33

Paper No: 1297.0

A Program to Teach Moderate Sedation in the Gastrointestinal Endoscopy Suite

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Background: Gastrointestinal endoscopists currently perform an average of 12 esophagogastroduodenoscopies and 22 colonoscopies per week in the United States.1 The use of moderate sedation during endoscopic procedures has improved the overall quality of the examination,2 increased both patient and physician satisfaction 3 and has, with few exceptions, become standard practice. Credentials required to perform moderate sedation vary among institutions, but published guidelines require providers to obtain training in the pharmacology of the agents commonly used, the ability to recognize complications associated with sedation, and advanced life support skills.4 Despite this, significant morbidity and mortality still exist related to sedation practices.5 Here we describe a simulation-based training program designed to train non-anesthesiologists in the administration of moderate sedation.

Methods: The project was supported by the Veteran's Affairs' National Center for Patient Safety in the US. We designed a program that incorporates clinical information relevant to moderate sedation practice but also emphasizes deliberate practice of technical skills (monitoring, airway support maneuvers, etc. as well as teamwork, leadership and communication. The program utilizes the "Moderate Sedation Toolkit for Non-Anesthesiologists", an educational tool produced by our group that has been published elsewhere.6

Description: The program includes:

(1) Didactic sessions designed to highlight core and target-audience derived moderate sedation topics
   (a) The Moderate Sedation Toolkit for Non-Anesthesiologists is provided to trainees for review prior to the date of training
   (b) A one hour-long session is conducted for GI nurses and physicians; the session will include identification and management of high-risk patients with emphasis on capnographic monitoring and dosage and titration of sedative-analgesics

(1) High-fidelity manikin in situ simulation sessions that will allow participants to integrate and apply learned moderate sedation concepts in the context of nurse / physician teams. Sessions will include four 20 minutes simulation scenarios followed by a video-assisted debrief.

(2) Effective teamwork, communication, and leadership skills are taught as part of the course.

(3) Program evaluation methods to measure effectiveness of the teaching program Summary We describe a moderate sedation training program for nurse/ physician teams providing moderate sedation in a GI endoscopy unit at a tertiary teaching hospital. The program utilizes a previously published educational toolkit in conjunction with in-situ high fidelity simulation. Non-technical skills are thought and evaluated as part of the program.

References

1 Cohen LB, Wecsler JS, Gaetano JN, *et al.* Endoscopic sedation in the United States: results from a nationwide survey. *Am J Gastroenterol.* May 2006; **101**(5): 967–974

2 Radaelli F, Meucci G, Sgroi G, Minoli G. Technical performance of colonoscopy: the key role of sedation/analgesia and other

quality indicators. *Am J Gastroenterol*. May 2008; **103**(5): 1122–1130
3 McQuaid KR, Laine L. A systematic review and meta-analysis of randomized, controlled trials of moderate sedation for routine endoscopic procedures. *Gastrointest Endosc*. May 2008; **67**(6): 910–923
4 Practice guidelines for sedation and analgesia by non-anesthesiologists. *Anesthesiology*. Apr 2002; **96**(4): 1004–1017
5 Sharma VK, Nguyen CC, Crowell MD, Lieberman DA, de Garmo P, Fleischer DE. A national study of cardiopulmonary unplanned events after GI endoscopy. *Gastrointestinal Endoscopy*. Jul 2007; **66**(1): 27–34
6 Mark J, Schroeder R, Barbeito A, Bonifacio A, For the Durham VAMC Patient Safety Center of Inquiry. *Moderate Sedation Toolkit for Non-Anesthesiologists*. 2010; http://www.patientsafety.gov/pubs.html - sedate. Accessed September 2, **2011**, 2011

Paper No: 1298.0

Introducing routine monitoring of vital signs and the WHO checklist at Mbarara Regional Referral Hospital, Uganda: an observational study

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Introduction: Maternal mortality remains high in sub-Saharan Africa, and many countries are not on track to achieve UN Millennium Development Goal 5 by 2015 (1). Mbarara Regional Referral Hospital undertakes approximately 8000 deliveries per annum (28% caesarean section rate, MMR 500:100 000 births). Common causes of maternal death are haemorrhage, sepsis, eclampsia and obstructed labour. Early recognition of abnormal vital signs and the use of a surgical checklist have been identified as potential ways to improve outcomes (2,3).
Objectives: The key objectives of this study were to introduce routine monitoring of vital signs and the WHO surgical safety checklist for mothers undergoing caesarean section.
Methods: Ethical approval was obtained. A baseline audit in August 2010 measured the percentage of mothers with vital signs recorded pre- and postoperatively. A visiting anaesthetist (NR) coordinated training from September 2010 to January 2011. Changes were introduced into practice using multiple PDSA cycles (plan-do-study-act) to improve the target outcomes. Lack of equipment was identified as a barrier and 4 mobile monitors were introduced with training. A MEOWS chart and checklist were formally launched in January 2011. Data was collected by weekly chart review by trained data abstractors.
Results: were plotted as percentages on weekly run-charts and presented at monthly obstetric meetings.
Results: Data was obtained for 86 caesarean sections in the baseline audit and 964 caesarean sections January - June 2011 (83% emergencies). Preoperative and postoperative blood pressure was recorded in 2/86 (2.3%) and 1/86 (1%) of patients at baseline. Preoperative blood pressure was recorded in all patients at the end of the study period (fig 1). Postoperative observations improved although the effect was not as marked. Prior to introduction of the WHO surgical safety checklist, no formal checks were undertaken. The use of the checklist was not sustained (fig 2). Retained surgical swabs were detected on two occasions as a result of using the checklist. Maternal deaths were lower than in the previous year.
Conclusions: We have shown that in resource limited settings it is possible to improve basic care processes such as routine blood pressure monitoring through local leadership, training and introduction of suitable equipment. Regular audits help change practice and improve patient care. Improvements in the uptake of the checklist were not sustained, despite demonstration of utility. Introducing the WHO checklist is a complex process in any setting and requires local champions and multidisciplinary team involvement to identify local barriers (4).

References

1 WHO Making Pregnancy Safer. http://www.afro.who.int/en/clusters-a-programmes/frh/making-pregnancy-safer.html. (accessed 3rd September 2012)
2 Bleyer AJ, Vidya S, Russell GB *et al.* Longitudinal analysis of one million vital signs in patients in an academic medical center. *Resuscitation* 2011: doi:10.1016/j.resuscitation.2011.06.033
3 Haynes AB, Weiser TG, Berry WR *et al.* A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med* 2009 **360**: 491–9
4 Kearns RJ, Uppal V, Bonner J *et al.* The introduction of a surgical safety checklist in a tertiary referral obstetric centre. *BMJ Qual Saf*. 2011 **20**: 818–22

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PHARMACOLOGY CLINICAL

(The names of the authors presenting each paper are shown in bold type)

Paper No: 29.00

Comparison Of Etomidate And Propofol For Rapid Sequence Intubation With Rocuronium

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Introduction: Conditions during tracheal intubation are determined not only by the neuromuscular blocking drug used but also by the intravenous agent used for induction.[1] Etomidate attenuates the diaphragmatic response to intubation and decreases the incidence of coughing during intubation [2,3]. Propofol depresses the pharyngeal and laryngeal responses to intubation and decreases muscle nicotinic receptor channel opening [4]. Rocuronium a non – depolarizing muscle relaxant circumvents the undesirable side effects of succinylcholine but itself has a strong diaphragmatic response to intubation [5].

Objectives: The aim of this study was to evaluate which of the two induction agents, etomidate or propofol provides ideal intubating conditions with rocuronium.

Methods: After obtaining ethics committee approval and written informed consent 108 patients, ASA I/II, aged 18-65 years undergoing elective surgery under general anaesthesia were included in the study. The patients were randomly divided into two groups of 54 each. Patients in group I received etomidate 0.3 mg/kg and patients in group II received propofol 2mg/kg. Rocuronium 0.6mg/kg was given in both the groups for neuromuscular blockade. Sixty seconds after injection of rocuronium, the trachea was intubated in all patients by anaesthesiologist who was blinded to the drugs used.

Intubation conditions was assessed using the criteria of Cooper and colleagues [6].

COOPER'S CRITERIA
Laryngoscopy
Impossible 0
Difficult 1
Fair 2 Easy 3
Condition of vocal cords
Closed 0
Closing 1
Moving 2
Open 3
Response to intubation
Severe coughing or bucking 0 Mild coughing 1 Slight diaphragmatic movement 2 None 3

A score of 8-9 was considered excellent, 6-7 good, 3-5 fair and 0-2 poor. Patients having excellent and good score were considered to have satisfactory intubation conditions whereas conditions were considered unsatisfactory if the score was fair and poor.

Heart rate and mean blood pressure were recorded for first 10 minutes postintubation

Results: In group I 50 patients had satisfactory intubation condition compared to 52 patients in group II ($p = .401$) . 4 patients in group I had unsatisfactory intubation conditions compared to 2 patients in group II ($p = .401$). There were no major haemodynamic changes and the haemodynamic parameters were comparable in both the groups.

Conclusions: The incidence of clinically satisfactory intubation conditions is similar with etomidate and propofol. Hence both these agents can be used safely for rapid sequence intubation.

Refrences

1 El-Orbany MI, Wafai Y, Joseph NJ, Salem MR. Does the choice of intravenous induction drug affect intubation conditions after a fast-onset neuromuscular blocker? *J Clin Anesth* 2003; **15**: 9–14.

2 Munhoz DC, Braga Ade F, Potério GM. Influence of propofol and etomidate on rocuronium-induced neuromuscular block: evaluation with acceleromyography. *Rev Bras Anestesio* 2002; **52**: 673–80.

3 Oglesby AJ. Should etomidate be the induction agent of choice for rapid sequence intubation in the emergency department? *Emerg Med J* 2004; **21**: 655–9.
4 Skinner HJ, Biswas A, Mahajan RP. Evaluation of intubating conditions with rocuronium and either propofol or etomidate for rapid sequence induction. *Anaesthesia* 1998; **53**: 702–6.
5 Mirakhur RK. Dose-response and time-course of action of rocuronium bromide. *Eur J Anaesthesiol Suppl* 1995; **11**: 23–5.
6 Cooper R, Mirakhur RK, Clarke RS, Boules Z. Comparison of intubating conditions after administration of Org 9246 (rocuronium) and suxamethonium. *Br J Anaesth* 1992; **69**: 269–73.

Paper No: 50.00

Effect of alkalinization of bupivacaine for epidural anaesthesia - a comparative study

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Introduction: Epidural anaesthesia is the anaesthesia of choice in various surgeries wherein general or spinal anaesthesia carries a risk. Bupivacaine, is the most commonly used drug for epidural blockade, but its slow onset of action remains the main drawback. Most local anaesthetics are supplied in solutions that are acidic in nature to improve the stability of the preparation. In an acidic preparation the local anaesthetic exists mostly in ionized form. Increasing the pH of the solution increases the concentration of the non ionic form of the drug In an attempt to increase the pH of the local anaesthetics, many alkaline compounds have been added like sodium bicarbonate, potassium chloride, dextran, urea, mannitol and folate, thereby achieving an increased concentration of non ionic form of drug. This study aims to evaluate the effects of the mixture of 0.5% bupivacaine and sodium bicarbonate on the onset, duration and efficacy of lumbar epidural blockade and compare it with that of plain bupivacaine.
Objective: To evaluate the effects of plain 0.5% Bupivacaine and alkalinized 0.5% Bupivacaine, on the onset and duration of lumbar epidural blockade and to compare the effects of both drugs.
Methods: Patients were randomly allocated to two groups of 30 each,

- Group I received 20ml of 0.5% bupivacaine
- Group II received 20 ml of 0.5% bupivacaine and 0.1ml of 7.5% sodium bicarbonate was added just prior to injection.

Patients were preloaded with 1000ml of crystalloid. Under strict asepsis lumbar epidural block was performed at the L3-L4 inter vertebral space.3ml of lignocaine with adrenaline was injected into the epidural space as test dose. After 3 minutes, with no signs of needle misplacement, the test solution was injected over 2 minutes. The end of injection was considered as point zero of the time measurements. Onset of sensory block was assessed by loss of sensation to pinprick. Observations were conducted at 30 second intervals. Motor block was evaluated at 2 minute intervals using Bromage scale.3 Duration of block was considered as time to regression by 2 segments. The efficacy of the block was adjudged by need of supplemental intravenous narcotics.
Results: Alkalinized Bupivacaine group showed rapid onset of sensory blockade as well as a prolonged duration of anaesthesia when compared to plain bupivacaine group. In relation to motor blockade there was no clinical advantage of alkalinization.
Conclusion: Alkalinization reduces the time of onset of sensory blockade and also prolongs the duration of action significantly, with no effects on motor blockade

References

1 McMorland GH, Douglas MJ, Jeffery WK, Ross PLE, Axelson JE, Kim JHK, Gambling DR, Robertson K. Effect of pH adjustment of bupivacaine on onset and duration of epidural analgesia in parturients. *Canadian Anesthetists Society J.* 1986; **33**(5): 537–541.
2 Morrison DH. Editorial: alkalinization of local anaesthetics. *Canadian J Anaesthesia* 1995; **42**(12):1076–1079.
3 Milner RJW, Gurd BC, Allan JG. Alkalinization of amide local anaesthetic by addition of 1% sodium bicarbonate. *European J. Anaesthesia* 2001; **17**(1): 38–42.
4 Cunningham NL, Kaplan JA. A rapid onset long acting regional anaesthetic technique. *Anaesthesiology* 1974; **41**: 509–517.
5 Bromage PR, Gertel M. Improved brachial plexus blockade with bupivacaine hydrochloride and carbonated lidocaine. *Anaesthesiology* 1972; **36**: 479–487.
6 Hilgier M. Alkalinization of bupivacaine for brachial plexus block. *Regional anaesthesia* 1985; **10**: 59–61.
7 Coventry DM, Todd JG. Alkalinization of bupivacaine for sciatic nerve blockade. *Anaesthesia* 1989; **44**: 467–470.
8 Zahl K, Jordan A, McGroaty J, Gotta AW. pH adjusted bupivacaine and hyaluronidase for peribulbar block. *Anaesthesiology* 1999; **72**: 230–232.
9 Capogna G, Cellena D, Laudano D, Giunta F. Alkalinization of local anaesthetics. Which block, which local anaesthetic? *Regional anaesthesia* 1995; **20**(5): 369–377.

Paper No: 74.00

Evaluation of intravenous tranexamic acid effects on bleeding, duration of surgery and surgeon's satisfaction in endoscopic sinus surgery

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Background and Objective: Functional Endoscpoic Sinus Surgery (FESS) is regraded as one of the most common surgeries in the field of head and neck. As the site of surgery

is extremely limited and contains too much vessels, even small amount of bleeding during surgery could obstruct the view. The purpose of this study was to assess the effect of intravenous administration of tranexamic acid on bleeding and surgeon's satisfaction during FESS which could help avoiding deliberate hypotension.

Methods: In a randomized double-blinded placebo-controlled clinical trial,100 patients with age of 18-50 years with ASA class I or II who were candidated for elective FESS at Loghman Hospital in 2010 were randomly assigned into two groups of control and intervention (50 patients in each group). In the intervention group, 20 minutes before induction of anesthesia, 500 mg tranexamic acid was injected intravenously and the patient in control group received the same volume of saline as placebo, and surgery was performed under general anesthesia. Demographic and hemodynamic variables, besides the amount of bleeding during surgery based on a 6 degree scale (not by volume of bleeding, since it is less than 200-300 ml), and surgeon's satisfaction were recorded and compared.

Results: Demographic variables (including age, sex and weight) showed no significant differences. Changes in mean arterial pressure in the control group ($P = 0.002$) and intervention group ($P = 0.014$) during surgery showed a significant reduction, but the pattern of changes in control and intervention groups were similar ($P = 0.99$). The heart rate changes in the control group ($P = 0.974$) and intervention group ($P = 0.512$) during the operation showed no significant differences. In addition, the pattern of changes in control and intervention groups were similar ($P = 0.938$). Similar Results on changes in the bleeding score in the control group ($P = 0.167$) and intervention group ($P = 0.50$) and the pattern of change in control and intervention groups($P = 0.366$) and surgeon's satisfaction score changes in control group ($P = 0.415$) and intervention group ($P = 0.682$) and the changing pattern in the two groups were obtained ($P = 0.658$).

Conclusions: Using Tranexamic acid 500 mg intravenously before starting FESS does not make any changes in surgical bleeding and surgeon's satisfaction.

References

1 Longneeker DE, Tinker JH, Morgan GE. *Principles and practice of Anesthesiology*; 2nd ed. St Louis: Mosby, 1998.

2 Boezaart AP, Van Der Merwe J, Coetzee A. Comparison of sodium nitroprusside- and esmolol-induced controlled hypotension for functional endoscopic sinus surgery. *CAN. J. ANAESTH*. 1995; **42**(51):373–376.

3 Rathjen T, Bockmuhl U, Greim CA. Modern anesthesiologic concepts supporting paranasal sinus surgery. *Laryngorhi-nootologie*. 2006; **85**: 20–3.

4 Jacobi KE, Bohm BE, Rickauer AJ, Jacobi C. Moderate controlled hypotension with sodium nitroprusside does not improve surgical conditions or decrease blood loss in endoscopic sinus surgery. *J clin Anesth* 2000; **12**: 202–7.

5 Coker N, Higgins DJ. Tranexamic acid ap-plied topically to achieve haemostasis. *Anesthesia*. 2000; **55**: 600–1.

6 Abul-Azm A, Abdullah KM. Effect of topical tranexamic acid in open heart surgery. *Eur J Anaesthesiol* 2006; **23**: 380–4.

7 Product information: Cyklokapron ® oral tablets, injection, tranexamic acid oral tablets, injection. Pharmacia and Upjohn company, Kalama 200ml/200.

8 Adams HP. Current status of antifibrinolytic therapy for treatment of patients with aneurismal subarachnoid hemorrhage. *Stroke* 1982; **13**(2):256–259.

9 Henry DA, Carless PA, Moxey AJ, O'Connell D, Stokes BJ, McClelland B, *et al.* Anti-fibrinolytic use for minimising perioperative allogeneic blood transfusion. *Cochrane Database Syst Rev*. 2007 (4):CD001886.

10 Gill JB, Chin Y, Levin A, Feng D. The use of antifibrinolytic agents in spine surgery. A meta-analysis. *J Bone Joint Surg Am*. 2008 Nov; **90**(11):2399–407.

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Can remifentanil administration during cardiopulmonary bypass control blood sugar level?

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Background and Objectives: Remifentanil is a short-acting opioid that does not accumulate in substantial quantities and can be administered in high doses intraoperatively since it has little or no influence on postoperative recovery (1). Adequate remifentanil administration can attenuate stress responses and inhibit hyperglycemic responses to surgery (2). We retrospectively compared the blood sugar levels in patients undergoing cardiopulmonary bypass (CPB). The patients were divided into 2 groups: one group received intermittent boluses of fentanyl and the other group received continuous remifenatil infusion.

Methods: All patients were scheduled for valve replacement surgery. Patients requiring intraoperative insulin administration were excluded from the study. The fentanyl group consisted of 20 patients who underwent surgery in 2008 before remifentanil was used in our hospital, and the remifentanil group consisted of 20 patients who underwent surgery in 2010. The blood sugar level was measured at T1: induction, T2: heparinization, T3: the start of CPB, T4: 30 min after CPB, T5: 90 min after CPB, and T6: after weaning from CPB.

Results: There were no significant differences in the demographic data of the 2 groups. The duration of CPB was significantly shorter in the fentanyl group than in the remifentanil group (178 } 29 min vs. 209 } 63 min, $P = 0.001$). In the fentanyl group, total doses of 15.7 } 5.5 ƒÊg kg-1 fentanyl were given. In the remifentanil group, remifentanil was infused at 0.1 - 0.2 ƒÊg kg-1 min-1 for the duration of CPB. The blood sugar level in the fentanyl group increased considerably and more quickly than the remifentanil group. Compared with at heparinization, both groups indicated significantly

elevated blood sugar levels at 90 min after CPB and after weaning from CPB (T1: 107 } 32 vs. 105 } 17; T2: 126 } 35 vs. 111 } 19; T3: 134 } 44 vs. 109 } 22; T4: 142 } 38 vs. 119 } 21; T5: 157 } 31 vs. 132 } 23; T6: 163 } 39 vs. 138 } 20 mg dL-1).

Conclusion: There was no significant difference in the elevation of blood sugar levels between the 2 groups. Continuous remifentanil administration was effective for suppressing the elevation of blood sugar level to a small extent, but not enough. Some studies (3-5) have reported that the perioperative stress response was attenuated with higher-dose of continuous remifentanil infusion than this study. And so, higher doses of remifentanil than those used in this study might be required during CPB in order to inhibit hyperglycemic responses.

References

1 Egan TD, Lemmens HJ, Fiset P, *et al.* The pharmacokinetic of the new short-acting opioid remifentanil (GI187084 B) in healthy adult male volunteers. *Anesthesiology* 1993; **79**: 881–92.

2 Marand E, Scambia G, Colicci S, *et al.* Leptin and perioperative neuroendocrine stress response with two different anaesthesic techniques. *Acta Anaesthesiol Scand* 2008; **52**: 541–6.

3 Winterhalter M, Brandl K, Rahe-Meyer N, *et al.* Endocrine stress response and inflammatory activation during CABG surgery. A randomized trial comparing remifentanil infusion to intermittent fentanyl. *Eur J Anaesthesiol* 2008; **25**: 326–35.

4 Kabon B, Kugener A, Gruenberger T, *et al.* Effects of continuous remifentanil administration on intra-operative subcutaneous tissue oxygen tension. *Anaesthesia* 2007; **62**: 1101–9.

5 Weale NK, Rogers CA, Cooper R, *et al.* Effect of remifentanil infusion rate on stress response to the pre-bypass phase of paediatric cardiac surgery. *Br J Anaesth* 2004; **92**: 187–94.

Paper No: 188.00

Derivation of an effect site model for the Integrated Propofol Pharmacokinetic model in Obese Patients

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Background: The recently published pharmacokinetic (PK) propofol model designed to be used in TCI mode in normal and obese patients1 has not included an effect site model to predict the time course of the effect. The goal of this study is derive a PD model extracted from a morbidity obese patient's population.

Methods: With Ethic institutional committee approval, patients proposed for bariatric surgery, using standard monitoring, arterial line and BIS®, received a plasma TCI with the study model using Anestfusor®. After the patients reach a calculated target of 12ug/ml we set the target in 0 until patients wake up(BIS>75) obtaining a complete BIS depression-recovery curve and the correspondent calculated Cp. With Anestfusor® the BIS and Cp calc data where stored every 5sec. Using NONMEM a complete IMAX model was derived and the plasma effect-site elimination rate constant(ke0) was used to link PK model predictions with BIS response data. A performance analysis comparing the measured and the obtained predicted BIS values for each calculated effect site concentration was done. No other drugs were given. Arterial blood samples for propofol assays were collected at 1,2,3,5,9 and 10 min to evaluate the PK performance of the model using Varvel2 methodology. The sample where analyzed in HPLC.

Results: 12 ASA I-II obese patients (47.7 ±11 yr, BMI 44±6 kg/mt2, weight 122±19 kg, height 169±9.9 mt) were studied. With basal BIS of 94, the PD model obtained a ke0 of 0.21 min-1, gamma 3.67 and an EC50 3.29 ug/ml. The performance error from the measured BIS vs. predicted BIS with the PD model was MDPE 0.55% (percentile 25-75: -19-14) and MADPE 15.8% (percentile 25-75:5-32). Pharmacodynamic time profiles of the measured observations vs. predicted BIS for the obtained model are shown in figure 1. The FK performance error during the studied time was MDPE -7% and MAPE 19%.

Conclusions: The time profile of propofol BIS effect in obese patient was well described (MDPE between ±20 and MDAPE<30%) with the extracted PD parameters (ke0 and Ce50) and allowed a good characterization of propofol TCI effect site mode in this population.

References

1 *Cortinez. BJA* **105** (4): 448–56; 2010

2 Varvel. *J Pharmacokinet Biopharm*, **20**: 63–94;1992

Paper No: 190.00

Performance evaluation of the Integrated Propofol Pharmacokinetic model in Obese Patients

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Background: Our group has recently published a Propofol pharmacokinetic (PK) model including data obtained in normal weight and obese patients1. This model hasn't been prospectively assessed in an obese population using target controlled infusion mode (TCI). The goal of this study was to evaluate the predictive performance of the model in a morbid obese population using TCI.

Methods: After Ethic institutional committee approval, patients proposed for bariatric surgery, using standard monitoring, radial arterial line and BIS®, received a plasma TCI with the study propofol model to reach a target 12 ug/ml and then 0 until patients wake up (BIS $>$ 75). Afterwards the patients received a TCI 4ug/ml during 30 min followed by a target 2.5 ug/ml until the end of the surgery. Remifentanil and tracheal intubation with neuromuscular blocks were used after reaching the propofol target of 4 ug/ml. Anestfusor® controlled the TCI pumps and stored the calculated plasma concentration (Cp calc) throughout the study period. Arterial blood samples for propofol assays were collected at 1,2,3,5,9, 10,15,20,40,60,90 min, at stop of infusion, and at 1,3,5,10,30,60,120 min after stopping. The samples were analyzed in HPLC. The performance error for the population and for each anesthetic phase (induction, maintenance, recovery) were calculated using Varvel methodology2 (Median performance errors (MDPE), Median absolute performance errors (MDAPE), Wooble and Divergence) between the Cp calc and the Cp measured.
Results: 14 ASA I-II adult obese patients (50.2 $\pm$ 9.7 yr, BMI 42 $\pm$ 6 kg/m2, Weight 118 $\pm$ 20 kg, 4 Female, 6 Male) were studied. Remifentanil was infused at a rate of 0.15 $\pm$ 0.06 ug/kg/min. We obtained 254 arterial blood samples of propofol. The global performance was poor, with an overprediction out of acceptable ranges (MDPE +28%, MADPE 38%, Wooble 29%, divergence value of 22%). The induction phase showed a MDPE -7% and MADPE 19%, the recovery phase MDPE +4,6% and MADPE 11% . The maintenance phase showed the worst performance, with a MDPE +41% and MADPE of 41%.
Conclusions: The integrated propofol PK model needs further adjustments before recommended it for TCI in morbidly obese patients.

References

1 Cortinez. *BJA* **105** (4): 448–56; 2010
2 Varvel. *J Pharmacokinet Biopharm*, **20**: 63–94;1992

Paper No: 191.00

Roll of recombinant factor VII activated in bleeding subsequent to cardiac surgery. Its application in Cardiovascular Anaesthesiology in a Medical Center in México

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Objective: To report the experience of the cardiovascular anesthesiology in the treatment of non-surgical bleeding with the use of the recombinant factor VII activated (rFVIIa). Setting: Medical Center of "Instituto de Seguridad Social del Estado de México y Municipios". México Design: Observacional, descriptive, retrospective study of a series of cases. Statistical analysis: Percentages as summary measure for qualitative variables. Material and
Methods: Between of June of 2006 to June of 2010, clinical records of the patients were reviewed, analyzed variables were: age, gender, type of cardiac surgery, anesthetic protocol, bleeding and complications, use of package blood, dose of rFVIIa, morbi-mortality.
Results: 22 patients in a period of 4 years were studied, of wich 16 were male, with age average of 59,6 years, weight average 64,8 Kgrs. Cardiac procedure were: coronary artery by-pass grafting (5 cases), mitral+aortic valve replacement (5), coronary artery by-pass grafting+mitral valve replacement (3), mitral valve replacement+tricuspid valve annuloplasty (3), Bentall-Bono surgery (3) and aortic valve replacement (3). Mean cardiopulmonary by-pass time 85.4 min. Using cell-saver in all the cases and a volume average of 367.5 ml. The used dose of rFVIIa was 90 mcr/kg, average of transfusion requirement were: red blood cells (4,0 U), fresh frozen plasma (6,2U), cryoprecipitate (3,3 U), platelet concentrates (3,2 U). Of number of red packed cells saved per intervention of factor VIIa used were 8.7 U. Chest tube drainage were before rFVIIa 1455 ml and after 326,5 ml. Three patients were re-exploration and 45 mcr/kg dose repeated. Only two complications for the anesthetic procedure and satisfactory evolution of 10 to 22 months.
Conclusion: Our Results suppose, that the use of rFVIIa as therapy of rescue for bleeding by coagulopathy after cardiovascular surgery is beneficial and diminishes the use of packed blood and re-exploration.

References

1 An update report by the American Society of Anaesthesiologists Task Force in perioperative blood transfusion and adjuvant therapies. Practice guidelines for perioperative blood transfusion and adjuvant therapies. *Anesthesiology* 2006; **105**: 198–208.
2 Friederich P, Henny C. Effect of recombinant activated factor VII on perioperative blood loss in patients undergoing retropubica prostatectomy: a double-blind placebo-controlled ramdomized trial. *Lancet* 2003; **361**: 201–05.
3 Ground M. Recombinant factor VIIa (rFVIIa) and its use in severe bleeding in surgery and trauma: a review. *Blood Rev* 2003; **17**: S11–S21.
4 González-Chon O. Sangrado postoperatorio. En: Complicaciones en la terapia postquirúrgica cardiovascular. O González-Chon. (Eds) *Manual Moderno 1ª Edición*, México 2002: 109–38.

Paper No: 306.00

Comparison of, lidocaine and Fentanyl on hemodynamic changes to laryngoscopy and tracheal intubation for Cardiac surgery

Ebrahim Nasiri Formi, Aria Soliamani, Hedayat Jafari, Yousef Mortazavi and Hossain Babatabar

Objective: Prevention of cardiovascular change during laryngoscopy and tracheal intubation is very important.. Comparison between oropharyngeal lidocaine Spray and IV lidocaine with fentanyl on hemodynamic response to laryngoscopy and intubation in CABG patients.
Methods: This study was prospective, randomized, double-blind, clinical trial, That performed on 66 ASA physical status III adult patients scheduled for elective CABG surgery requiring general anesthesia and laryngoscopy and orotracheal intubation in teaching hospital at Mazandaran province, Iran. Patient s randomized to receive intravenous lidocaine 1.5 mg/kg (n = 21, L-IV group) or pharyngeal spray 4 puff 10% lidocaine, (n = 22, l-s group) or 4 meg/kg fentanyl (n = 23, routine group = control group) two minutes before laryngoscopy. Laryngoscopy and tracheal intubation was attempted two minutes later. Induction of anesthesia for all of the groups were similar. Systolic blood pressure(SBP), diastolic blood pressure (DBP), heart rate(hr), Mean Arterial Pressure(MAP) and Spo2 were recorded by digital Datascope monitor at before induction of anesthesia (baseline), just before laryngoscopy, and immediately after intubation,1,3,5,10 minutes after intubation. Arrhythmia in electrocardiography, ETCo2, Time of laryngoscopy and intubation were also documented.
Results: All post intubation value of SBP, DBP, HR, and MAP no different between three groups. All of the values more significantly less than baseline after induction of anesthesia ($p < 0.05$). These are increasing post intubation but no more than baseline values.
Conclusion: Lidocaine 1.5 mg/kg or 4 puff spray 10% 2 min before laryngoscopy same like fentanyl 4 meg /kg effective in attenuating the hemodynamic response to laryngoscopy and tracheal intubation

Keywords: Lidocaine; Fentanyl; Hemodynamic change; Laryngoscpy; Tracheal intubation

Paper No: 327.00

Magnesium sulphate: an adjuvant therapy for resection of pheochromocytoma

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Introduction: Pheochromocytomas are catecholamine secreting neuroendocrine tumours. They are responsible for 0.1-0.2% of all cases of hypertension. The morbidity and mortality in an emergency situation is 50% but less than 2% in planned surgery [1]. Traditionally, preparation for resection of pheochromocytoma is made with alpha and beta blockers. Magnesium sulphate has been used in the anaesthetic approach in this patients but isn't always effective in controlling blood pressure.
Case Report: The authors report a case of a 48 years-old male with a diagnostic of pheochromocytoma proposed for laparoscopic adrenalectomy. In the preoperative evaluation his blood pressure was 133/79mmHg but without orthostatic hypotension. Electrocardiogram showed a sinus rhythm with a heart rate of 63beats•min-1 and blood tests revealed a hematocrit of 47.4%. He started phenoxybenzamine 10mg three times a day for 21 days and stopped after an extra dose at midnight of the day of surgery, Diazepam was give on the eve to control anxiety and begun an infusion of 0.9% sodium chloride (62ml•h-1). On the day of surgery he was pre-medicated with esomeprazole (40mg), ondansetron (4mg) and magnesium sulfate (4g). After standard monitoring and placing a central and arterial line, a total intravenous anesthesia was started with bolus of fentanil and perfusion of propofol, rocuronium and magnesium sulfate (1g•hr−1). The patient was hemodynamically stable throughout the entire procedure with a maximum systolic blood pressure of 140mmHg and a cardiac frequency between 60-90bpm. Postoperative period was uneventful and he was discharged at the seventh day.
Conclusion: The main objective in the preoperative optimization of these patients is to control the blood pressure, heart rate, arrhythmias and to allow restoration of blood volume [1,2]. Although there's no consensus on the best pharmacological agent or optimal duration of therapy for the preparation of these patients for pheochromocytoma surgery, our report showed a successful case of the use of magnesium sulphate. Magnesium sulphate is the second most import intracellular cation and, among other actions, inhibits the release of catecholamines from the adrenal medulla, peripheral adrenergic terminals and directly blocks catecholamine receptors. Also has direct vasodilatory effects and antiarrhythmic properties and should be considered in the perioperative management of this patients.

References

1 *Acta Anaesthesiol Belg*; 2009; **60** (1): 55–66.
2 *Can J Anesth*; 2001; **48** (9): 876–80.

Paper No: 399.00

New oral anticoagulants in orthopedic surgery: A retrospective study

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Introduction: Dabigatran (DAB) and rivaroxaban (RIV) are new oral anticoagulants recently released for thromboprophylaxis after elective total hip arthroplasty (THA) and total knee arthroplasty (TKA). DAB has demonstrated non-inferiority and RIV has demonstrated superiority versus enoxaparin in THA and TKA but to date, there is no study comparing DAB and RIB in these indications [1-4].
Objectives: We compared the efficacy and safety of DAB versus RIB in treated patients from our unit.
Methods: This was a retrospective study conducted in patients undergoing scheduled THA or. All patients received oral thromboprophylaxis 6 to 8 hours after the end of surgery, consisting of DAB 110 then 220 mg/day (or 75 then 150 mg/day if creatinine clearance was <60 mL/min) or RIV 10 mg/day at the discretion of the anesthesiologist. Treatment was administered during 2 weeks in case of TKA and 5 weeks in case of THA. Thromboembolic events – clinical deep vein thrombosis (DVT), assessed by Doppler, and pulmonary embolism (PE) – and hemorrhagic events during the postoperative period were collected. Quantitative date were analyzed by Student's t test after verification of the normality of their distribution by Kolmogorov-Smirnov test, and qualitative data were analyzed by $?^2$ test, a value of $p < 0.05$ being considered as statistically significant.
Results: In total, 88 patients were analyzed (39 DAB and 49 RIV). Demographic data were similar between groups. Anesthetic procedures, type and duration of surgery were similar between groups. Thromboembolic events were similar between DAB and RIV groups: 2 (5%) vs 2 (4%) distal DVT ($p < 0.05$), and 0 vs 1 (2%) PE ($p < 0.05$), respectively. Hemorrhagic events were similar between groups, with 1 (3%) vs 1 (2%) transfusion of 2 blood cells units in DAB and RIV groups, respectively ($p < 0.05$). No late thromboembolic event was observed at surgical follow-up visit after 45 days.
Conclusion: This retrospective study did not show any significant difference between new oral anticoagulants in orthopedic surgery. These Results are different from a recent meta-analysis suggesting that RIV may be superior to DAB for thromboprophylaxis but with a moderately higher hemorrhagic risk [5]. However, this was an indirect comparison between DAB and RIV since comparator was enoxaparin in the included studies. A randomized prospective trial comparing new oral anticoagulants in orthopedic surgery is required to determine any difference between DAB and RIV.

References

1 Eriksson BI, *et al. Lancet* 2007; **370**: 949–56.
2 Eriksson BI, *et al. J Thromb Haemost* 2007; **5**: 2178–85.
3 Eriksson BI, *et al. N Engl J Med* 2008; **358**: 2765–75.
4 Lassen MR, *et al. N Engl J Med* 2008; **358**: 2776–86.
5 Loke YK, *et al. J Clin Pharm Ther* 2011; **36**: 111–24.

Paper No: 441.00

The effects of remifentanil on the QT interval and transmural dispersion of repolarization (Tp-e): Target-controlled infusion versus manual infusion

Carlos Germán Soto, María Ivón, Ruiz Melisa, Sanchez Ramski, Evangelina Gagliardo and Cesar Doménico

Introduction: Prolongation of the corrected QT (QTc) and Tp-e (interval from the peak to the end of the T wave) intervals is related with sympathetic stimulation and risk of arrhythmias. Target-controlled infusion (TCI) achieves a defined target concentration without overshoot or overdosing, which is common when using manual infusions. The purpose was to determine if remifentanil by TCI avoid the prolongation of QTc and Tp-e intervals during laparoscopic cholecystectomy.
Objectives: To compare the effects of two different remifentanil infusion techniques on QTc, Tp-e, remifentanil requirement and effect site concentration (Ce).
Methods: A prospective, double-blinded study, ASA I patients. Anesthesia was induced and maintained with propofol. Muscle relaxation with vecuronio. Two groups randomized: Manual Controlled Infusion (MCI) n15 remifentanil 0,5 ug/kg/min, and Target-Controlled Infusion (TCI) n15 TCI remifentanil Cp 4 ng/ml. Both infusion were reduced 50 % posintubation, and then adapted according to hemodynamic. The QTc and Tp-e intervals were measured in lead II by ergometer: baseline (T0), before intubation (T1), after intubation (T2), after skin incision (T3). Remifentanil requirement and Ce were obtained by a pharmacokinetic model, posintubation, pos skin incision and end of surgery. Systolic and diastolic arterial pressure and heart rate were measured until the end of surgery. Standard monitoring included electrocardiogram, pulse oximetry, temperature and EtCO2.
Results: Patients demographic characteristics were similar concerning sex ratio (F 86,7% vs 100%), age ($40,2 \pm 10,0$ vs $37,9 \pm 14,6$), body weight ($75,7 \pm 16,2$ vs $70,4 \pm 12,9$), duration of surgery ($72,1 \pm 26,8$ vs $72,8 \pm 26,8$) and anesthesia ($83,2 \pm 26,3$ vs $86,0 \pm 29,7$), Lean body mass ($50,6 \pm 8,3$ vs $46,4 \pm 4$), Body Mass Index ($83,2 \pm 26,3$ vs $86,0 \pm 29,7$). Hemodynamic variables were stable in both groups. The QTc and Tp-e intervals were prolonged during T2 in MCI ($X \pm de$) compared to baseline values ($462,2 \pm 34,9$, $p < 0,002$; $97,0 \pm 6,5$, $p = 0,006$). Remifentanil requirement TCI vs MCI posintubation $104,7 \pm 19,9$ vs $227,7 \pm 66,8$ ($p = 0,0002$), pos skin incision $160,5 \pm 58,5$ vs $367,0 \pm 83,4$ ($p < 0,0002$), end of surgery $1085 \pm 450,4$ vs $1872,2 \pm 1025,4$ ($p = 0,007$). Ce remifentanil TCI vs MCI posintubation $3,3 \pm 0,8$ vs $8,2 \pm 2,2$ ($p < 0,0001$), pos skin incision $3,2 \pm 1,2$ vs $7,5 \pm 1,9$ ($p < 0,0001$), end of surgery $4,9 \pm 2,0$ vs $8,1 \pm 2,1$ ($p < 0,0001$).

Conclusions: Although the two intravenous techniques compared differ slightly, remifentanil by TCI attenuated the QTc and Tp-e prolongation associated with laryngoscopy and tracheal intubation, with lower doses and effect site concentration. Infusion by pharmacokinetic model could be indicated in elderly and cardiac patients, in which an accurate opioids concentration is necessary.

References

1 Kweon T, Nam S, Chang C, *et al.* The effect of bolus administration of remifentanil on QTc interval during induction of sevoflurane anaesthesia. *Anaesthesia* 2008; **63**: 347–351.

2 Nakao S, Kiyohiko H, Chisato S, *et al.* Sevoflurane causes greater QTc interval prolongation in elderly patients than in younger patients. *Anesth Analg* 2010; **110**: 775–9.

3 Whyte S, Booker P, Buckley D. The effects of propofol and sevoflurane on the QT interval and transmural dispersion of repolarization in children. *Anesth Analg* 2005; **100**: 71–7.

Paper No: 450.00

Role of ketamine and dantrolen on the apoptotic effect of isoflurane in rats

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Introduction: Mechanism of action of isoflurane includes Gamma amnino butyric acit A receptor (GABA-A) activation, while ketamine is mediated via N-Methyl D-Aspartat (NMDA) receptor inhibition. Apoptosis has been induced by abnormal activation of GABA-A or inhibition of NMDA1. Dantrolen showed neuroprotective effect on apoptosis2.
Objective: Effects of ketamine and/or dantrolen on the isoflurane induced apoptotic neurodegeneration were investigated.
Methods: Thirty Wistar male rats were randomly assigned to five groups, each containing n = 6, in order to investigate the effects of ketamine and/or dantrolen on the isoflurane induced apoptosis. Oxygen 100% was administered into the closed cage for 2 hours in the control group, whereas 1.4% isoflurane in 100% oxygen was administered in the other 4 groups. Six hours after intraperitoneal injection of dantrolen 10 mg/kg (Group Iso+Dant), ketamine 40 mg/kg (Group Iso+Ket) and dantrolen+ketamine (Group Iso+Dant+Ket), rats were sacrified.
Results: Immunoreactive cells in the hypocampus CA-1 region for caspase 3 in group Iso+Ket and for caspase 8 and 9 in group Iso, group Iso+Ket, and group Iso+Ket+Dant were significantly higher than the control group. Immunoreactive cells in the hypocampus CA-1 region for caspase 3, 8 and 9 in group Iso+Ket were significantly higher than all groups, whereas it was higher in group Iso with respect to only group Iso+Dant and it was higher for group Iso+Ket+Dant than group Iso+Dant. Significantly more immunoreactive cells in the dentat gyrus region for caspase 3 and 8 in group Iso and group Iso+Ket and for caspase 9 in group Iso, group Iso+Ket, and group Iso+Ket+Dant versus control were observed. Caspase 3 and 8 in group Iso+Ket was significantly more than other groups. Whereas caspase 9 in group Iso+Ket was higher than that of group Iso+Dant and group Iso+Ket+Dant. Caspase 3 and 9 in group Iso+Ket+Dant was significantly lower than only group Iso. Caspase 3, 8 and 9 were similar between group Iso+Ket+Dant and group Iso+Dant.
Discussion: Isoflurane induced apoptosis in rats increased by ketamine and decreased by dantrolen. Since apoptotic neurodegeneration has been shown in hypocampus which was related to short term memory, these Results might be important during anesthesia in patients with Alzheimer or demansia and dantrolen might be useful because of its neuroprotective effects.

References

1 Xiang et al. Ketamine: The best partner for isoflurane in neonatal anasthesia? *Med Hipotheses* 2008.

2 Muehlschlegel et al. Dantrolen: Mechanisms of neuroprotection and possible clinical aplications in the neurointensive care unit. *Neurocrit Care* 2009.

Paper No: 456.00

Evaluation of Electrocardiography After Combined Use of Ondansetron and Diltiazem in Anesthetized Rats

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Introduction: Ondansetron is a 5-hydroxytryptamine-3 (5HT) receptor antagonist and it is currently used to prevent perioperative nausea and vomiting. Ondansetron has an effect on electrocardiography such as QRS widening, prolongation of QT and PR intervals. Although Diltiazem is an ideal agent to treat perioperative acute hypertension, it also causes bradycardia and prolonged PR interval.
Objectives: Our goal is to investigate any changes in rat electrocardiography with combined use of Ondansetron and Diltiazem.
Methods: Computer programs and recording apparatus specially prepared by the authors for the study was used to record and to analyze electrocardiography. Lead I electrocardiogram signals from 17 male albino Wistar rats were amplified using a biopotential amplifier and then recorded to

computer hard disk at 12 bit resolution and 20 KHz sampling rate. Records during the initial first 5 minutes kept as "Baseline" record after proper anesthesia. Then, intravenous Ondansetron (200 ?g/kg) was injected to the rats, followed by 5 minutes of another electrocardiography record. Similar procedure was repeated with the injection of intravenous Diltiazem (1000 ?g/kg). The software measured only RR interval and QT time from the records automatically. QT time was corrected with Bazett formula (QTc) in the evaluation. Obtained data were initially analyzed within themselves and then with data from all experimental animals statistically in order to reach a conclusion.

Results: The consequent administration of Ondansetron and Diltiazem was not found to have a statistically significant effect on heart rate. However, QTc from 9 rats were statistically longer after the administration of Ondansetron. In 2 rats, a statistically significant decrease in their QTc was determined. When Diltiazem was given after Ondansetron, in 10 rats out of 11, the QTc time was correlated negatively with prior measurement. There is no statistically significant difference between the QTc of baseline electrocardiography and the QTc obtained after the administration of Diltiazem.

Conclusions: QTc changes that occur upon Ondansetron administration can be corrected by giving Diltiazem and therefore, we believe that combination of Ondansetron and Diltiazem can be safe.

References

1 Kuryshev YA, Brown AM, Wang L, Benedict CR, Rampe D. Interactions of the 5-hydroxytryptamine 3 antagonist class of antiemetic drugs with human cardiac ion channels. *J Pharmacol Exp Ther* 2000; **295**: 614–20.

2 Viswanathan PC, Rudy Y. Pause induced early afterdepolarizations in the long QT syndrome: a simulation study. *Cardiovasc Res* 1999; **42**: 530–42.

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Comparison of Intramuscular Metoclopramide and Subcutaneous Hyoscine as Prophylactic Drugs for Late Post Operative Nausea and Vomiting in Viterectomy Patients

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Introduction: Post operative nausea and vomiting (PONV) are common complications of anesthesia in outpatient surgeries, especially ophthalmic surgeries such as viterectomy (1). Anesthesia, type of surgery, use of opioids, premedication, age, gender, smoking, underlying disease and surgery's duration affect the incidence of PONV (2). It is suggested that patients' individual characteristics and risk factors related to anesthesia are more important (3-5). Metoclopramide, and Hyoscine are two drugs that are used for treatment of PONV. (6)

Objectives: Because of short half-life of Metoclopramide and Hyoscine and their restricted effect on early PONV after intravenous administration, we decided to use Metoclopramide intramuscularly and Hyoscine subcutaneously, in aim to slower release and possible better effects on late POVN.

Methods: Number of 105 patients over 60 year old who undergoing vitrectomy were enrolled in this double blinded study. Patients randomly assigned into 3 groups (35 patients per group) and each group received Metoclopramide (10 mg, Intramuscular), Hyoscine (20 mg, subcutaneously) or no drug (control), respectively, as premedication before anesthesia induction. The incidance and severity of nausea and vomiting were assessed using VRS scale in recovery room, 6 hours and 24 hours after surgery. The Results were analyzed using X2 test.

Results: 24 hours after surgery in 49 patients who had experienced nausea, 18 (36/7%) were in Hyoscine group, 16 (32/7%) were in Metoclopramide group and 15 (30/6%) were in control group. From 40 patients with mild nausea, 15 (37/5%) were in Metoclopramide group, 11 (27/5%) were in Hyoscine group and 14 patients (35%) were in control group. From 16 people who had experienced severe nausea, the Results of Hyoscine and control groups were the same and 6 (37/5%), and 4 (25%) were in Metoclopramide group. ($P = 0.84$) 24 hours after surgery in 70 patients with no vomiting, 26 (37/1%) were in Hyoscine group, 24 (34/3%) were in Metoclopramide group, and 20 (28/6%) in control group. Of the 26 patients with mild vomiting, 10 were in control group, 9 (34/6%) were in Metoclopramide group and 7 (26/9%) were in Hyoscine group. Of the 9 patients with severe vomiting, 5 patients were without medication (55/6%) and 2 patients (22/2%) were in Metoclopramide group and 2 in Hyoscine group. ($P = 0.54$)

Conclusion: Based on finding of this study, it seems that despite these drugs were somehow successful in controlling late post operative nausea and vomiting, but there was no statistically difference in their effects.

Paper No: 568.00

Propofol reduces the pupil dilation response to noxious stimulation in humans

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Introduction: Pupil dilation is a potential biomarker for both analgesic effect and anesthetic depth, but it is not a simple sympathetic reflex. Event-related pupil dilation response

(PDR) is a complex, cognitively-mediated response related to defense, and as such it may prove useful for assessing sedation level in conscious patients.
Objectives: The purpose of this study is to evaluate the PDR to noxious fingertip stimulation as an index of propofol sedation level.
Methods: We varied mixture target effect-site concentrations of propofol (0, 0.5, 1.0, 1.5 ƒÊg/mL), measuring Somatosensory Evoked Potential (SEP), PDR, and pain report (PR) responses to painful electrical fingertip stimulation at high and low intensities in 27 female volunteers.
Results: Mixed effects model statistical analyses revealed that: (1) Propofol significantly reduces the amplitude of SEP peaks related to attentional processes ($P < 0.01$) in a dose related fashion; (2) PDR amplitude significantly diminishes with increasing propofol sedation dose in a dose related fashion ($P < 0.05$); (3) PR correlates positively with PDR and SEP amplitudes; and (4) The decrease in PDR to noxious stimulation during propofol sedation correlates with sedation level, as gauged with the Bispectral Index and the Observerfs Assessment of Alertness/Sedation, as well as blood concentrations of propofol.
Conclusions: The PDR is a useful gauge for light sedation induced by propofol. Propofol may exert a mild analgesic effect.

References

1 Oka S, Chapman CR, Kim B, Nakajima I, Shimizu O, Oi Y. Pupil dilation response to noxious stimulation:Effect of varying nitrous oxide concentration. *Clinical Neurophysiology*, **118**,2016–2024, 2007.

Paper No: 579.00

Plasma concentration of bupivacaine after spinal anesthesia with single shot femoral nerve block in total knee arthroplasty

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Introduction: Femoral nerve block is commonly established for postoperative analgesia in total knee arthroplasty but no evidence of plasma bupivacaine level has been reported.
Objectives: The aim of our study was to determine the plasma concentrations of bupivacaine in patients who had single-injection of femoral nerve block.
Methods: A prospective observational study was undertaken with 25 patients scheduled for unilateral total knee arthroplasty under spinal anesthesia and single shot femoral nerve block with 20 mL of 0.5% bupivacaine. Venous blood samples were collected at 0, 5, 10, 15, 30, 60, 90, and 120 minutes after femoral nerve block. Plasma bupivacaine levels were analyzed by using a high performance liquid chromatography with tandem mass spectrometry method.
Results: Four male and 21 female, ASA I-II were enrolled in this study. Mean age, body mass index and serum albumin level were 69.9+5.95 years, 27+3.67 kg/m2 and 4.46+0.26 mg/dL respectively. The median of peak plasma concentration was 538.35 ng/mL (min = 176.30, max = 1,383.99) at 60 minutes after femoral nerve block, while the maximal plasma concentration of bupivacaine was 1,883.39 ng/mL at 10 minutes. Nobody showed signs and symptoms of bupivacaine toxicity.
Discussion: The peak plasma concentration of bupivacaine after femoral nerve block alone was similar to the peak plasma bupivacaine level following combined sciatic block and femoral 3 in 1 block reported by Misra et al.1 (60+7 min) but was little different from the conclusion of Moore et al.2 which was peak at 15 minutes and persisted up to 60 minutes. However, the plasma bupivacaine level between 5 to 10 minutes and 60 to 90 minutes in our study were significantly changed ($p = 0.00$ and 0.02 respectively). We postulated that the blood level started rising within 10 min and reached its peak at 60 min before decreasing.
Conclusion: Peak plasma concentrations of bupivacaine were demonstrated at 60 minutes after single shot femoral nerve block, and no signs and symptoms of bupivacaine toxicity.

Reference

1 Misra U, Pridie AK, McCylmont C, Bower S. Plasma concentrations of bupivacaine following combined sciatic and femoral 3 in 1 nerve blocks in open knee surgery. *Brit J Anaesth*. 1991; **66**: 310–3.
2 Moore DC, Mather LE, Bridenbaugh LD, Balfour RI, Lysons DF, Horton WG. Arterial and venous plasma levels of bupivacaine following peripheral nerve blocks. *Anesth Analg*. 1976; **55**(6):763–8.

Paper No: 626.00

Prophylactic intravenous palonosetron, granisetron and ondansetron in the prevention of post operative nausea and vomiting in laparoscopic surgeries

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Introduction: Post operative nausea and vomiting (PONV) are distressing symptoms that are more pronounced in laparoscopic surgeries. It may result in dehydration, electrolyte imbalance, increased bleeding, increased pain perception and delayed discharge of the patient.1
A wide range of antiemetics are available, but adverse effects e.g. excessive sedation, dry mouth, hallucinations, extrapyramidal symptoms etc. have been noted. 5HT3 antagonists are devoid of such side effects and are highly effective.2 Earlier studies have indicated that the newer 5HT3

antagonists e.g; palonosetron & granisetron have advantages over ondansetron.3,4,5But to the best of our knowledge, there is no study comparing these three drugs.

Objectives: This study has been done to determine which among these three 5HT3 antagonists would be more suitable (greater efficacy, longer duration of action & lesser side effects) for prevention of PONV.

Methods: Ninety patients (18 to 60 yrs of age) undergoing laparoscopic surgeries under GA, according to standard institutional protocol were randomly allocated into three groups containing 30 patients each. Group A received palonosetron .075mg, group B received granisetron 1mg and group C received ondansetron 4mg IV. Parametrical data was analyzed using one way ANOVA and Student t test to compare the difference between different groups. Differences within groups were evaluated using paired t test.

Results: The incidence of complete response(CR) during 0-6 hr postoperative period was 76.6% with ondansetron, 86.6% with granisetron & 93.3% with palonosetron. The incidence during 6-12 postoperative hr was 60%, 86.6% & 93.3% respectively; during 12- 18 postoperative hr, it was 40%, 83.3% & 93.3% and during 18-24 postoperative hr, it was 33.3%, 73.3% & 93.3%. Thus, during 0-18 hrs post operative period, CR is significantly higher in group A & B than groupC ($p < 0.05$). During 18-24 hrs postoperative period, CR is significantly higher in group A than group B & C($p < 0.05$). There was no statistically significant difference in the adverse effects between groups.

Discussion & Conclusions: Preventing PONV is the cornerstone of a good anesthetic technique. Our study suggests that Palonosetron prevents PONV effectively and for a longer period than other 5HT3 antagonists. Due to its greater potency and longer half life it may become the preferred 5HT3 antagonist for PONV prevention. 4,5 Since a single dose may be sufficient, it could also be cost effective. However, because of the small sample size of this study, further studies with a larger sample size are required.

References

1 White PF, Shaper A. Nausea & vomiting; causes and prophylaxis, seminar. *Anesthesiology* 1998; **6**: 300–08.

2 Fujii Y, Tanaka M, Toyooka H. Clinical aspect of granisetron, droperidol & metoclopramide in the treatment of postoperative nausea & vomiting after laparoscopic cholecystectomy. *Pak J Anaesth* 1997; **14**: 14–19.

3 Bhattacharya D, Benerjee A. Comparison of ondansetron, granisetron for PONV following day care gynaecologist laparoscopy. *Ind J Anaesth* 2003; **4**: 279–82.

4 Rojas C, Stathis M, Thomas AG, Massuda E, Alt J, Zhang J, Rubenstein E, Sebestiani S, Cantoreggi S, Snyder SH, Slusher B. Palonosetron exhibit unique molecular interactions with the 5HT3 receptor. *Anesth Analg* 2008; **107**: 469–478.

5 Bhattacharya DP, Dawn S, Nayak S, Roy PR, Acharya A, Dey R. Comparision between palonosetron and granisetron to prevent PONV after laparascopic surgeries. *J Anaesthesiol Clin Pharmacol*. 2010; **26**(4):480–483.

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Ramosetron vs. ramosetron plus dexamethasone on the PONV after laparoscopic cholecystectomy

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Introduction: Patients undergoing general anesthesia for laparoscopic cholecystectomy have a high risk of postoperative nausea and vomiting (PONV). Ramosetron and dexamethasone have been reported to be effective for the prophylaxis of PONV following laparoscopic cholecystectomy but their synergistic effect has not been investigated.

Objectives: We compared and investigated the effect of ramosetron and ramosetron plus dexamethason on PONV prophylaxis after laparoscopic cholecystectomy.

Method: Forty patients scheduled for laparoscopic cholecystectomy were allocated randomly to one of two groups ($n = 20$ in each) to receive 0.3 mg ramosetron (group I), or 0.3 mg ramosetron plus 8mg dexamethasone (group II) intravenously. Balanced anesthesia with desflurane and remifentanil was used in all patients. Postoperative nausea, retching, vomiting, pain (100 point verbal rating scale, VRS) and side effects were assessed at 2 h, 24 h and 48 h after surgery.

Result: No statistical differences were observed among the three groups with regard to patient characteristics and information on surgery and anesthesia. The ratio of PONV was higher in groups I than group II; 35% ($n = 7$, group I) vs. 5% ($n = 1$, group II) during the first postoperative 24 h ($p = 0.044$). In addition, rescue antiemetics were used in significantly fewer patients in group II ($n = 1$, 5%) than group I ($n = 7$, 35%) ($p = 0.044$) during the first 24 h after surgery. In addition, postoperative pain was significantly lower group II than in group I during postoperative 2 h (75 $i\frac{3}{4}$ 16 in group I vs. 42 $i\frac{3}{4}$ 26 in group II, $p = 0.00$). The use of rescue analgesics and the incidences of adverse effect were comparable between the two groups. There was no clinically serious adverse event due to study drugs.

Conclusion: Ramosetron plus dexamethasone was more effective than ramosetron alone for the prophylaxis of PONV and postoperative pain control after laparoscopic cholecystectomy (24 h).

References

1 Nesek-Adam V, Grizelj-Stojcic E, Rasic Z, Cala Z, Mrsic V, Smiljanic A. Comparison of dexamethasone, metoclopramide, and their combination in the prevention of postoperative nausea and vomiting after laparoscopic cholecystectomy. *Surg Endosc*. 2007; **21**: 607–612.

2 Leksowski K, Peryga P, Szyca R. Ondansetron, metoclopramid, dexamethason, and their combinations compared for the prevention

of postoperative nausea and vomiting in patients undergoing laparoscopic cholecystectomy: a prospective randomized study. *Surg Endosc*. 2006; **20**: 878–882.

3 Ryu J, So YM, Hwang J, Do SH. Ramosetron versus ondansetron for the prevention of postoperative nausea and vomiting after laparoscopic cholecystectomy. *Surg Endosc*. 2010; **24**: 812–817.

Paper No: 691.00

Association of 5-ht3 receptor gene polymorphism with the efficiency of ondansetron for postoperative nausea and vomiting

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Introduction: Postoperative nausea and vomiting (PONV) is a common and distressing complication in patients undergoing general anesthesia. However, although 5-hydroxytryptamine type 3 (5-HT3) receptor antagonists have significantly reduced PONV, it is reported that over 35% of patients treated with ondansetron experience PONV. Though the cause of failure in ondansetron treatment is not clear, we assumed that polymorphism in the 5-HT3 receptor gene would contribute to such inter-individual variation.
Objectives: In this study, we investigate whether the polymorphisms of 5-HT3 receptor gene affect the efficacy of ondansetron to prevent PONV in patients undergoing general anesthesia for laparoscopic surgery.
Methods: Two hundred and eighty-eight adult patients undergoing laparoscopic surgery are enrolled in this study. Anesthetic technique is standardized. Sevoflurane and remifentanil are used for maintenance of anesthesia. A bispectral index score is monitored to maintain appropriate anesthetic depth. Thirty minutes before the end of surgery, ondansetron 0.1 mg/kg is administered intravenously. We assess an episode of PONV at first 2 h and 2-24 h after surgery. The incidence of PONV is compared among genotypes in 5-HT3 receptor gene polymorphisms (5-HT3a: S253N; 5-HT3b: Y129S, -100_-102delAAG; 5-HT3c: K163N, A405G, 3'UTR A/G; 5-HT3d: IVS5+14, A36G, H52R, 3UTR C/T; 5-HT3e: T86A, G2722A).
Results: There were no significant differences in demographic and clinical data according to genotypes. Frequencies of the 5-HT3b AAG deletion genotypes were as follows: 83.3% for wild type, 12.5% for heteromutant, and 4.2% for homomutant. Among 5-HT3b AAG deletion genotypes, the incidence of PONV was higher in patients with homomutant than other genotypes during the first 2 hr after surgery ($P = 0.03$). There were no significant differences in the incidence of PONV according to genotypes during 2-24 hr after surgery. In other 5-HT3 receptor gene genotypes, there were no significant differences in the incidence of PONV according to genotypes during first 2h and 2-24 hr after surgery.
Conclusions: The response to ondansetron for PONV was significantly influenced by 5-HT3b gene polymorphisms. Therefore, 5-HT3b AAG deletion mutation gene may be a clinical biomarker of responsiveness for ondansetron for PONV.

Reference

1 Tremblay PB, Kaiser R, Sezer O, Rosler N, Schelenz C, Possinger K, *et al.* Variations in the 5-hydroxytryptamine type 3b receptor gene as predictors of the efficacy of antiemetic treatment in cancer patients. *J Clin Oncol* 2003; **21**: 2147–55.

Paper No: 715.00

Propofol Pharmacokinetic and Pharmacodynamic Profile in Elderly Patients

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Background: Despite the wide use of propofol target-controlled infusion (TCI) in elderly patients, only one pharmacokinetic (PK) pharmacodynamic (PD) model has formally characterized the effect of aging in propofol PKPD profile. Using a canonical analysis of the EEG, as a measure of propofol hypnotic effect, the authors did not find an influence of age in the plasma effect site equilibration rate constant (ke0).The PKPD performance of this model, however, has not been prospectively validated in elderly patients. The aim of this study is to assess the PK and PD performance of the Schnider model in elderly patients and to compare it with a new PKPD propofol model derived with BIS data.
Methods: After BIS® and routine monitors were placed, 14 ASA I-II elderly patients (>65 yr) were anesthetized with plasma TCI of propofol based on Schnider model. After partial recovery from the bolus dose a remifentanil infusion was started and continued throughout surgery. All BIS and TCI data were continuously recorded. Arterial blood samples for propofol assays were collected at 1, 2, 3, 5, 10, 20, 40 and 60 min post-induction, and at 0, 1, 3, 5, and 10 min after stopping the infusion. A three compartment effect site model linked to a Sigmoidal Emax PD model, were used to fit all the data simultaneously in NONMEM. Median performance errors(MDPE), and median absolute performance errors(MDAPE) were calculated to measure bias and accuracy of each model. Comparisons between models were performed with Wilcoxon signed rank test.
Results: All fourteen, ASA I-II adult patients (74 yr, range 69–100) were studied. The global PK performance of the new developed model was: MDPE =-3.7% and MDAPE 22.4%. The global PD performance of this model was: MDPE =0.2% and MDAPE 3.4%. The global PK performance of the Schnider model was good (MDPE =12.2% and

MDAPE 25.9%), but worst than that of the new developed model ($p < 0.01$ and $p = 0.025$ for MDPE and MDAPE respectively). Considering the TCI bolus dose given, the time to peak effect predicted by the Schnider model was much faster (2.0 min, range 1.8-2.3) than that predicted by the new developed model (3.4 min, range 2.4-4.8; $p < 0.01$).
Conclusions: The PK model derived by Schnider and colleagues confirmed its adequacy for plasma TCI in elderly patients. The much slower effect time profile observed in elderly patients, compared to the Schnider model predictions, suggests that age reduces the plasma effect site equilibration rate.

Paper No: 718.00

A comparative study of two maternal anesthetic strategies: impact on fetal acidosis and fetal cardiac function in an ovine model

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Introduction: Fetal cardiac compromise is often observed during exposure to high concentration desflurane for fetal surgical procedures. Low dose of desflurane supplemented with intravenous anesthesia (propofol and remifentanil) (SIVA) is an alternative technique for inhalational general anesthesia for fetal surgery. In our preliminary human retrospective study, we observed less fetal cardiac depression when we decreased dose and time of maternal desflurane exposure. To eliminate the limitations of retrospective nature in our previous study, we designed prospective and controlled experiments using fetal-maternal sheep model.
Objectives: To compare fetal cardiac function and acid-base status during maternal exposure to two different anesthetic techniques by using transuterine fetal echocardiography, hemodynamic parameters and blood gas analysis.
Methods: After the institutional IACUC approval, 19 pregnant ewes with 105-110 days of gestation (term 147-150 days) were instrumented, followed by 5 days of recovery. In this randomized, controlled, crossover trial, each instrumented ewe was exposed to both SIVA and high dose desflurane (HD-DES) anesthetic techniques with a washout interval of 40 hours between anesthesia. HD-DES group was exposed to 1.2 MAC of desflurane (10.2%) for 60 minutes, and then 2 MAC (18%) for 90 minutes. The SIVA group was exposed to propofol 450 mcg/kg/min and remifentanil 0.5 mcg/kg/min for 60 minutes, and then desflurane was started at 1.2 MAC and the infusion rate of propofol was decreased to 75 mcg/kg/min, remifentanil at 0.25 mcg/kg/min for 90 minutes. Transuterine fetal echocardiography was performed every 30 minutes after induction of anesthesia. Maternal-fetal blood pressure, heart rate, uterine and umbilical blood flow were continuously monitored. Maternal-fetal blood gas and lactate were analyzed at baseline, then every 30 minutes throughout the experiment.
Results: In HD-DES group, maternal blood pressure and uterine blood flow were significantly lower than SIVA group. There were no significant differences in maternal heart rate, fetal blood pressure, fetal heart rate and umbilical blood flow between the two techniques. Fetuses in HD-DES group developed acidosis over time; however, there was no significant difference in shortening fraction detected on fetal echocardiography.
Conclusion: Compared to SIVA technique, HD-DES induces significant maternal hypotension and reductions in uterine blood flow resulting in fetal acidosis. Fetal echocardiography did not reflect these changes. These data suggest that SIVA may be a preferable technique for maternal anesthesia during fetal surgery, and that more sensitive fetal echocardiographic techniques may be needed to assess fetal cardiac function during fetal surgery.

References

1 Myers LB, Cohen D, Galinkin J, Gaiser R, Kurth CD. Anaesthesia for fetal surgery. *Paediatr Anaesth*. 2002 Sep;**12**(7):569–78.
2 Garcia PJ, Olutoye OO, Ivey RT, Olutoye OA. Case scenario: anesthesia for maternal-fetal surgery: the Ex Utero Intrapartum Therapy (EXIT) procedure. *Anesthesiology*. 2011 Jun;**114**(6):1446–52.
3 Boat A, Mahmoud M, Michelfelder EC, Lin E, Ngamprasertwong P, Schnell B, *et al.* Supplementing desflurane with intravenous anesthesia reduces fetal cardiac dysfunction during open fetal surgery. *Paediatr Anaesth*. 2010 Aug;**20**(8):748–56.

Paper No: 732.00

Derivation of an effect site model for the Integrated Propofol Pharmacokinetic model in Obese Patients

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Background: The recently published pharmacokinetic (PK) propofol model designed to be used in TCI mode in normal and obese patients1 has not included an effect site model to predict the time course of the effect. The goal of this study is derive a PD model extracted from a morbidity obese patient's population.
Methods: With Ethic institutional committee approval, patients proposed for bariatric surgery, using standard monitoring, arterial line and BIS®, received a plasma TCI with the study model using Anestfusor®. After the patients reach a calculated target of 12ug/ml we set the target in 0 until patients wake up(BIS>75) obtaining a complete BIS depression-recovery curve and the correspondent calculated Cp. With Anestfusor® the BIS and Cp calc data where stored

every 5sec. Using NONMEM a complete IMAX model was derived and the plasma effect-site elimination rate constant(ke0) was used to link PK model predictions with BIS response data. A performance analysis comparing the measured and the obtained predicted BIS values for each calculated effect site concentration was done. No other drugs were given. Arterial blood samples for propofol assays were collected at 1,2,3,5,9 and 10 min to evaluate the PK performance of the model using Varvel2 methodology. The sample where analyzed in HPLC.

Results: 14 ASA I-II obese patients (47.7 $\pm$11 yr, BMI 44 $\pm$ 6 kg/mt2, weight 122 $\pm$ 19 kg, height 169 $\pm$ 9.9 mt) were studied. With basal BIS of 94, the PD model obtained a ke0 of 0.21 min-1, gamma 3.67 and an EC50 3.29 ug/ml. The performance error from the measured BIS vs. predicted BIS with the PD model was MDPE 0.55% (percentile 25-75: -19-14) and MADPE 15.8% (percentile 25-75:5-32). The FK performance error during the studied time was MDPE -7% and MAPE 19%.

Conclusions: The time profile of propofol BIS effect in obese patient was well described (MDPE between $\pm$20 and MDAPE$<$30%) with the extracted PD parameters (ke0 and Ce50) and allowed a good characterization of propofol TCI effect site mode in this population.

References

1 Cortinez. *BJA* **105** (4): 448–56; 2010

2 Varvel. *J Pharmacokinet Biopharm*, **20**: 63–94;1992

Paper No: 734.00

To evaluate the efficacy of tranexamic acid in reducing perioperative blood loss and its effect on shunt patency in patients undergoing lieno renal shunt surgeries for extrahepatic portal venous obstruction: A prospective, randomized, double blind, placebo controlled study

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Introduction: Lieno renal shunt (LR shunt) surgery is done in extrahepatic portal venous obstruction (EHPVO) which often Results in significant blood loss. Tranexamic acid(TXA)has been found to be effective in reducing perioperative blood loss by its antifibrinolytic effect.

Objectives: This study designed to ascertain whether the use of TXA would reduce the perioperative blood loss and allogenic blood transfusion in patients undergoing LR shunt surgeries and to address its concerns regarding its use in vascular shunt procedures with respect to maintenance of shunt patency in these patients.

Methods: 32 patients undergoing LR shunt surgery were randomly assigned to receive either bolus of TXA 10mg/kg(0.1ml/kg) intravenously at induction followed by 1mg/kg/hr infusion (n = 16) or placebo bolus of NS 0.1 mL/kg,followed by infusion @ 0.01mL/kg/hr of NS.Infusion of TXA / NS continued until skin closure.

Parameters studied : vital parameters, total bleeding, total PRBC, PRP, FFP, plasma transfused (perioperatively in 24 hours)Doppler study for shunt patency at 24 hours, D-dimer, Fibrinogen, PT, aPTT, perioperatively at 2 hours and 24 hours, any complications like thrombotic complications, etc.

Results: There was significant reduction in the mean postoperative blood loss in Group TXA [697.50 ml Vs 1200 ml; p = 0.012]. The time-related changes in the postoperative blood loss showed that there was significant reduction in the postoperative blood loss at 24 hrs in tranexamic acid group (150 ml vs. 300 ml, p = 0.028) as compared to the placebo group. There was no significant difference in the blood product administration between the two groups.Fibrinogen levels were lower in the TXA group compared to the placebo group in postoperative period (326.88 ¡À 72.55 mg/dl Vs 382.5 ¡À 66.18 mg/dl; p = 0.021). TXA did not have any effect on lienorenal shunt patency. Other test Results were not significantly different between the two groups.

Conclusion: The use of Tranexamic acid significantly reduces the postoperative blood loss in LR shunt surgeries. The study could not find significant difference in the intraoperative and total blood loss or any difference in the amount of blood products administered between the two groups. Tranexamic acid did not have any effect on lienorenal shunt patency

References

1 Wu C-C, Ho W-M, Cheng S-B, *et al.* Perioperative Parenteral Tranexamic Acid in Liver Tumor Resection. *Ann Surg*. 2006; **243**(2): 173–180.

2 Wong J, El Beheiry H, Rampersaud YR, *et al.* Tranexamic Acid reduces perioperative blood loss in adult patients having spinal fusion surgery. *Anesth. Analg*. 2008; **107**(5):1479–1486.

3 Ferraris VA, Brown JR, Despotis GJ, *et al.* 2011 Update to The Society of Thoracic Surgeons and the Society of Cardiovascular Anesthesiologists Blood Conservation Clinical Practice Guidelines. *Ann. Thorac. Surg*. 2011; **91**(3):944–982.

4 Goobie SM, Meier PM, Pereira LM, *et al.* Efficacy of Tranexamic Acid in Pediatric Craniosynostosis Surgery: A Double-blind, Placebo-controlled Trial. *Anesthesiology*. 2011; **114**(4):862–871.

5 Dadure C, Sauter M, Bringuier S, *et al.* Intraoperative Tranexamic Acid Reduces Blood Transfusion in Children Undergoing Craniosynostosis Surgery: A Randomized Double-blind Study. *Anesthesiology*. 2011; **114**(4):856–861.

6 Yamasaki S, Masuhara K, Fuji T. Tranexamic acid reduces postoperative blood loss in cementless total hip arthroplasty. *J Bone Joint Surg Am*. 2005; **87**(4):766–770.

7 Henry DA, Carless PA, Moxey AJ, *et al.* Anti-fibrinolytic use for minimising perioperative allogeneic blood transfusion. *Cochrane Database Syst Rev*. 2011;3:CD001886.

Paper No: 801.00

Efficacy of high-dose intravenous infusions of esomeprazole and omeprazole in reducing mortality and re-bleeding in peptic ulcer disease: a retrospective cohort study

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Introduction: Peptic ulcers account for about 48% of gastrointestinal bleeding episodes.1 Recurrent bleeding has been identified as a risk factor for mortality,2 and proton-pump inhibitors (PPIs) like esomeprazole and omeprazole, are commonly used to reduce the risk of re-bleeds. At identical doses, esomeprazole achieves higher plasma concentrations than omeprazole due to a lower first-pass metabolism and slower plasma clearance.3 As such, esomeprazole, being the active S-isomer of omeprazole, would be expected to be significantly more effective than omeprazole in the treatment of gastric acid-related disorders. In April 2009, our institution's parenteral drug of choice for the management of patients with active bleeding peptic ulcers was switched from omeprazole to esomeprazole.
Objectives: This study compared the efficacy of omeprazole and esomeprazole in reducing the incidence of a re-bleed after an initial peptic ulcer bleed, as well as the mortality rates associated with the bleed.
Methods: In this retrospective cohort study, we identified patients who had received >24 hours of treatment (intravenous bolus, followed by 8 mg/hour infusion) with omeprazole (April 2008 to March 2009) or esomeprazole (April 2009 to March 2010). Only patients with a documented peptic ulcer bleed on first endoscopy were then reviewed. Patients who died as a consequence of the bleed, and those who underwent a second endoscopy within 72 hours that confirmed a re-bleed, were also identified.
Results: A total of 214 patients were reviewed, of which 129 patients had received omeprazole and 85 patients were given esomeprazole. Twenty (15.5%) omeprazole recipients and 19 (22.4%) esomeprazole recipients were required to undergo a second endoscopic procedure (odds ratio [OR] 0.637; 95% confidence interval [CI] 0.317-1.281; $p = 0.211$). The bleeding-related mortality rates between the two treatment groups were also similar: omeprazole 16.2% vs esomeprazole 20.0% (OR 0.782; 95% CI 0.386-1.586; $p = 0.584$). Analysis of baseline patient demographics and comorbidities did not find statistical differences between the omeprazole or esomeprazole groups in terms of reducing the need for a second endoscopy ($p = 1.29$, 95% CI 0.273-1.180) or reducing mortality ($p = 0.959$, 95% CI 0.472-2.203).
Conclusion: No clinical differences were observed between parenteral omeprazole and esomeprazole in bleeding-related mortality rates or the incidence of re-bleeding. Follow up studies could be performed to evaluate the efficacy of 'pharmaceutically-equivalent' dosages of the two agents (e.g., omeprazole 8 mg/hour vs esomeprazole 4mg/hour).

References

1 Silverstein FE, Gilbert DA, Tedesco FJ, Buenger NK, Persing J. The national ASGE survey on upper gastrointestinal bleeding. I. Study design and baseline data. *GastrointestEndosc*1981; **27**: 73–79.
2 Hsiu Chi-Cheng, Bor-Shyang Sheu. Intravenous proton pump inhibitors for peptic ulcer bleeding: clinical benefits and limits. *World J Gastrointest Endosc* 2011 Mar 16; **3**(3): 49–56.
3 Morgner-Miehlke A, Petersen K, Miehlke S, Labenz J. Esomeprazole: potent acid suppression in the treatment of acid-related disorders. Esomeprazole: potent acid suppression in the treatment of acid-related disorders. *Expert Rev ClinImmunol*. 2005 Nov; **1**(4):511–27.
4 Lau James YW, Sung Joseph JY, *et al.* Effect of intravenous omeprazole on recurrent bleeding after endoscopic treatment of bleeding peptic ulcers. *The New England Journal of Medicine*. 2000:**343**: 310–6.

Paper No: 806.00

Genetic polymorphism associated with post-operative morphine consumption and incidence of side effects

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Introduction: Management of acute postoperative pain is a major issue. Only 25% of postoperative patients receive appropriate treatment (1). To improve patient care, research focuses on identifying predictors of acute pain and postoperative use of analgesics (1,3). Genetic factors appear to influence both sensitivity to pain and analgesic requirement for effective pain control (4). The aim of this study was to evaluate the influence of genetic factors on morphine (M) consumption and incidence of side effects after major surgeries in Lebanese patients admitted to Hôtel-Dieu hospital.
Methods: Fourty-four patients undergoing orthopedic or abdominal surgery were included in this prospective pilot study. All had a standard GA using N2O, halogens, fentanyl and muscle relaxant. They received (M) before extubation (0.05-0.1mg/kg) followed by titration in the PACU until VAS? 3 and acetaminophen 1gr q6 IV for 48h. Patient Controlled Analgesia (PCA) was started in PACU with 2mg/10mn for 48h with possibility to raise bolus to 3mg/10mn if the VAS was ? 5. The

cumulative 24 and 48hours dose of (M) and side effects were noted. The protocol was approved by the local ethic committee and all patients gave a written informed consent and were genotyped for three single-nucleotide polymorphisms (SNPs) in genes coding for mu-opioid receptor (c.118A>G, OPRM1), catechol-O-methyltransferase (p.Val158Met, COMT) and P-glycoprotein efflux transporter (c.3435C>T, ABCB1).

Results: No significant differences were detected in demographic characteristics of patients. Doses of (M) administered were highly variable between patients, 10 to 137 mg per 24h and 16 to 179 mg per 48h. The respective median doses were 44 mg and 65 mg. Univariate analysis showed that homozygous patients TT with ABCB1 SNP consumed significantly less morphine at 48h compared with heterozygous CT ($p < 0,025$) and CC ($p < 0,036$) patients, but TT patients expressed more nausea ($p < 0,009$). None of the demographics factors or other SNPs was associated with postoperative morphine dose requirements or adverse effects.

Conclusions: If these Results are confirmed on a larger cohort, it will underline the importance of individualizing analgesic therapy and optimizing the medical treatment, in terms of efficacy, safety and cost. A preoperative genotyping could determine acute pain management strategies. Standard or minor analgesic treatment with good control of nausea might be sufficient for homozygous TT patients, while CC and CT patients would be ideal candidates for PCA based on a "multimodal" analgesia.

References

1 Wu HL, *et al.*, *Acta Anaesthesiol Taiwan*. 2011 Jun;**48**(2):75–9.
2 Sommer M, *et al. Eur J Anaesthesiol*. 2008 Apr;**25**(4):267–74.
3 Coulbault L, *et al. Clin Pharmacol Ther*. 2006 Apr;**79**(4):316–24.
4 Wu CL, *et al. Lancet*. 2011 Jun 25;**377**(9784):2215–25.
5 Apfelbaum JL, *et al. Anesth Analg*. 2003 Aug;**97**(2):534–40.

Paper No: 812.00

The effect of magnesium sulphate on the speed of onset and quality of neuromuscular bloking by cisatracurium during induction of anesthesia with priming method

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Introduction: During induction of anesthesia patients may be at the risk of aspiration. If the onset and speed of muscular relaxation could be increased, risk will be decreased.

Objectives: In order to reach this goal, We studied the effect of magnesium in the speed and quality of relaxation with cisatracurium.

Methods: A prospective randomized study was designed with 88 patients in ASA class I & II. Patients were randomly assigned to three groups. Group 1 received 100CC normal saline (NS). And in Groups 2 & 3 magnesium sulfate 25 & 50 mg/kg was infused respectively during 10 minutes before induction of anesthesia. Anesthesia was induced with 5 mg/kg thiopental and 0.15mg/kg cisatracurium, with priming method. Neuromuscular monitoring of ulnar nerve with single twitch test was done until the responses to twitches were disappeared. The times were measured. After intubation anesthesia was maintained with 100 μg/kg/min Propofol. The intensity of blockade was measured at 2, 5, 10, 15, 20, 25 and 30 min after intubation with PTC test.

Results: The onset of neuromuscular blockade in magnesium sulfate 50 group was faster than the normal saline group. The mean time of muscle relaxation in group 1, 2 & 3 were 226, 209 & 188 seconds respectively ($p = 0.047$). The comparison of neuromuscular blocking intensity in groups was Mg50> Mg25> NS in all times of evaluations, and this difference in the Mg50 group was significant ($p < 0.05$).

Discussion: Using magnesium sulfate before cisatracurium during induction of anesthesia with priming method can increase the speed of onset & intensity of neuromuscular blockade by cisatracurium.

Conclusion: Although magnesium can speed up the effect of cisatracurium but this increase isn't enough for using cisatracurium in rapid sequence induction.

References

1 Jonsson M, Dabrowski M, Gurley DA, *et al.* Activation and inhibition of human muscular and neuronal …. *Anesthesiology*. 2006 Apr; **104**(4): 724–33.
2 Magorian T, Flannery KB, Miller RD: Comparison of rocuronium, succinylcholine, and vecuronium for rapid-sequence induction …. *Anesthesiology*. 1993, **79**: 913–918.
3 Bryson HM, Faulds D. Cisatracurium besilate. A review of its pharmacology and …. *Drugs*. 1997 May; **53**(5): 848–66.
4 Kenaan CA, Estacio RL, Bikhazi GB. Pharmacodynamics and intubating conditions of cisatracurium in …. *J Clin Anesth*. 2000 May; **12**(3):173–6.
5 Shih-Pin Lin, Kuang-Yi Chang, Yu-Ju Chen, *et al.* Priming with Rocuronium to Accelerate the Onset Time of Cisatracurium …. *J of the Chinese med associ*. 2009: Vol **72**, Issue1:15–19.
6 Deepika K, Kenaan CA, Bikhazi GB, *et al.* Influence of the priming technique on pharmacodynamics and …. *J Clin Anesth*. 1999 Nov; **11**(7):572–5.
7 Pinard AM, Donati F, Martineau R, *et al.* Magnesium potentiates neuromuscular blockade with cisatracurium …. *Can J Anaesth*. 2003 Feb; **50**(2): 172–8.
8 Sinatra RS, Philip BK, Naulty JS, *et al.* Prolonged neuromuscular blockade with vecuronium in a patient treated with magnesium sulfate. *Anesth Analg* 1985,**64**: 1220–1222.
9 Fuchs- Buder '1', Wilder-Smith OH, Borgeat A, et al: Interaction of magnesium sulphate with … .Br J Anaesth. 1995, 74;405–409.
10 Fahmy Tawfik, Azer Nivin: The effect of intraoperative magnesium sulfate infusion on …. *J of the Egyptian national cancer institute*.2002:vol.**14**, No.2, June; 137–144.

11 Czarnetzki C, Lysakowski C, Elia N, *et al.* Time course of rocuronium-induced neuromuscular block after pre-treatment with magnesium …. *Acta Anaesth Scand* 2010; **54**: 299–306.
12 Kussman B, Shorten G, Uppington J, *et al.* Administration of magnesium sulphate before rocuronium. *Br J Anaesth*. 1997:**79**;122–124.

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Post succinylcholine prolonged neuromuscular blockade. Case report

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Background: Succinylcholine is the only depolarizing muscle relaxant used today because of its pharmacokinetic and pharmacodynamic characteristics. It is metabolized by plasma cholinesterase. A quantitative and qualitative alteration of the enzyme changes the time of action of muscle relaxant.
Objective: A case of prolonged neuromuscular blockade post Succinylcholine and anesthetic management. Materials and
Methods: A male 58 years old entering to larynx scheduled surgery for suspected tumor. Succinylcholine was used as a muscle relaxant. After finishing surgery the patient presented a delayed anesthetic recovery, so it was suspected the presence of atypical plasma cholinesterase as a differential diagnosis. In this situation remained hypnosis and mechanical ventilation.
Results: After 90 minutes without signs of neuromuscular recovery was decided the administration of fresh frozen plasma, after which the patient regained spontaneous ventilation and were able to conduct a successful anesthetic recovery. Was performed a measurement of the level of plasma cholinesterase that was below normal limits. Was not confirmed the presence of atypical enzyme for not having a dedicated laboratory.
Discussion: The presence of neoplastic disease is associated with a reduction in plasma cholinesterase activity. There is also a wide variability of genetic alterations that determine the presence of an atypical enzyme. Treatment must include mechanical ventilation of the patient and maintenance of hypnosis. The use of fresh frozen plasma is a valid alternative but controversial for treatment.
Conclusions: The presence of a low concentration of plasma cholinesterase and / or atypical form is a differential diagnosis that the anesthesiologist should consider at prolonged apnea after administration of Succinylcholine as muscle relaxant.

Keywords: Succinylcholine; plasma cholinesterase; prolonged neuromuscular blockade

References

1 Naguib M, Lien C. Pharmacology of muscle relaxants and their antagonists. In: Miller RD editor. *Mille's Anesthesia*. 7th ed. United States of America: Churchil Livingstone Elsevier; 2010. 29.
2 Donati F, Bevan D. Neuromuscular blocking agents. In: Barash P, Cullen B, Stoelting R, Cahalan M, Stock M editors. *Clinical Anesthesia*. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2009. 20: 499–530.
3 Mollerup H, Gätke M. Butyrylcholinesterase gene mutations in patients with prolonged apnea after succinylcholine for electroconvulsive therapy. *Acta Anaesthesiol Scand* 2011; **55**: 82–86.

Paper No: 986.00

Effects of ulinastatin on hepatic enzyme after hepatic resection

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Background: Urinary trypsin inhibitor (UTI) has been widely used for the treatment of diseases including the disseminated intravascular coagulation, shock, and pancreatitis. Since UTI synthesis is likely to be reduced in the patient (pt) who had undergone the hepatic resection, the incidence of inflammatory reaction may be increased accordingly. For such pts, the increase of hepatic enzyme after operation can reflect the liver damage. The purpose of this study was to examine if ulinastatin can inhibit the increase of the hepatic enzyme on the hepatic resection.
Methods: After receiving IRB approval, a retrospective chart review was performed on 201 pts who underwent hepatic resection from 2006 to 2010. We divided the records into control ($n = 69$) group and ulinastatin ($n = 132$) group, according to the use of intraoperative ulinastatin, and compared the preoperative and postoperative AST and ALT levels between two groups. The number of pts who showed more than 10 times elevation of AST or ALT levels after surgery was compared between two groups. We examined the relationship between LFT and prothrombin time (PT).
Results: The mean AST and ALT levels after liver resection were significantly lower in ulinastatin groups compared with control group. The number of pts who showed more than 10 times elevation of hepatic enzymes after hepatic resection was significantly higher in control group compared with ulinastatin groups (21.7%v. 9.8%, $p = 0.024$). The relationship between LFT and PT has shown that there exist a positive correlation ($r = 0.5$).
Conclusion: Ulinastatin can decrease the elevation of AST and ALT level after hepatic resection.

Reference

1 Park JH, Kwak SH, Jeong CW, Bae HB, Kim SJ. Effect of ulinastatin on cytokine reaction during gastrectomy. *Korean J Anesthesiol* 2010; **58**: 334–7.

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General anesthesia for thyroid surgery: comparison of remifentanil infusion with nitrous oxide

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Introduction: Routine use of Nitrous Oxide (N2O) has been questioned in the recent years because of its established toxicities and side effects 1,2. Alternative agents are available and remifentanil has gained popularity in this regard, due to its similiar pharmacokinetics with N2O 3,4.
Objectives: The aim of our study is to compare the clinical effectiviness and the side effects of intraoperative remifentanil infusion and N2O.
Methods: After ethics commitee approval and obtaining written informed consent, 75 patients udergoing thyroidectomy with desflurane-fentanil general anesthesia were randomly allocated to three groups (N2O, remifentanil and control). In the N2O-group flowmetre was set to give 2 lt/min N2O and 1lt/min oxygen. In the remifentanil and control groups flowmetres were set to give 2 lt/min air and 1lt/min oxygen. In the Remifentanil group an infusion of 0.085 mcg/kg/min remifentanil was started (This is an infusion rate that will produce stable 2 ng/mL remifentanil whole blood concentration4. This concentration makes a similiar degree of MAC reduction in desflurane as expected with 70% N2O4) . In the N2O and control groups salin infusions were started. All of the other anesthetic procedures were the same for all groups and for extra analgesic needs fentanil was given in 0.001mg/kg bolus doses as needed. Demographics; hemodynamics; time to eye opening, place and time orientation; nausea/vomiting and the drug doses; the first analgesic request time, and doses; patient, surgeon and anesthetist satisfaction scores; were recorded. Pain scores at resting, during neck movement and caughing were recorded at every ten minutes after extubation.
Results: Intraoperative maintanenece fentanyl doses(mg) for N2O, remifentanil and control groups were respectively $0,05 \pm 0,06$ vs. $0,07 \pm 0,06$ vs. $0,11 \pm 0,08$. Fentanyl dose was significantly less than control group both in the N2O and remifentanyl groups ($p = 0,01$ and $p = 0,03$,respectively). There was no significant difference between N2O and remifentanyl groups for the intraoperative maintanence fentanyl doses ($p = 0,44$). All other findings were unsignificantly different between groups ($p > 0.05$ for all).
Conclusions: We compared the clinical effectiviness and side effects of Remifentanil infusion with N2O during thyroidectomy. There were no difference regarding the intraoperative and postoperative analgesic use and side effects. Finding good alternatives to nitrous oxide anasthesia may be an important contribution to modern anesthesia practice.

References

1 Enlund M, Edmark L, Revenäs B. Ceasing routine use of nitrous oxide-a follow up. *Br J Anaesth*. 2003 May;**90**(5):686–8.
2 Myles PS, Leslie K, Chan MT, Forbes A, Paech MJ, Peyton P, Silbert BS, Pascoe E; ENIGMA Trial Group. Avoidance of nitrous oxide for patients undergoing major surgery: a randomized controlled trial. *Anesthesiology*. 2007; **107**(2):221–31.
3 Lee LH, Irwin MG, Lui SK. Intraoperative remifentanil infusion does not increase postoperative opioid consumption compared with 70% nitrous oxide. *Anesthesiology*. 2005 Feb;**102**(2):398–402.
4 Mathews DM, Gaba V, Zaku B, Neuman GG. Can remifentanil replace nitrous oxide during anesthesia for ambulatory orthopedic surgery with desflurane and fentanyl? *Anesth Analg*. 2008 Jan; **106**(1):101–8.

Paper No: 1113.0

Effect of morphine on lower urinary tract discomfort related to transurethral resection of prostate after general anaesthesia

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Introduction: Lower urinary tract discomfort (urge to void, burning sensation and distress about the indwelling catheter) after transurethral resection of the prostate (TURP)is a common problem. Lower urinary tract discomfort (LUTD) may be due to catheter related bladder discomfort, overactive bladder symptoms or both after TURP (1,2).
Objectives: In this randomized, prospective study we evaluated the effect of intravenous morphine on TURP related LUTD.
Methods: 60 patients undergoing TURP were divided into two equal groups (Group C: control group, Group M: morphine group).Induction and maintenance of anesthesia were standartized in both groups. Patients in Group M received IV morphine 0,04 mg kg-1 diluted in 100 ml normal saline whereas Group C patients received 100 ml iv normal saline 20 mins. before the expected extubation time. Paracetamol 1 gr ý.v. was used for analgesia in group C. Patients in Group M received morphine 0.01 mg kg-1 infusion during the 24 hours follow-up postoperatively, whereas patients in Group C received normal saline which looked identical to morphine. The incidence and severity of LUTD, pain (Numerical Rating Scale -NRS-), sedation level (Ramsay sedation scale), postoperative nausea and vomiting (PONV) and respiratory depression were recorded as soon as the patient became cooperative and 1,2,6,12 and 24 hours after the operation. Fisher's exact test, students t test and Mann Whitney U tests were used.
Results: The incidence of LUTD was lower in group M at all measurement times($p < 0.05$) except for 2 hours postoperatively. The severity of LUTD was lower in group M at 0, 12 and

24 hrs postoperatively($p = 0.001$; $p = 0,04$; $p = 0,02$ respectively). Pain scores were lower in Group M at 0 ($p = 0,003$) and 6. hrs ($p < 0,001$). PONV incidence was higher in group M patients ($p = 0.03$). The incidence of pruritus, respiratory depression, oversedation were similar among the groups.
Conclusion: Alleviating the lower urinary tract symptoms after TURP by morphine may be due to its inhibitory effect on bladder contractions which is the mainstay of overactive bladder and CRBD therapy (3,4). We conclude that morphine is an effective and safe drug reducing lower urinary tract discomfort after TURP.

References

1 Tauzin-Fin P, Sesay M, Svartz, *et al.* Sublingual oxybutinin reduces postoperative pain related to indwelling bladder catheter after radical retropubic prostatectomy. *Br J Anaesth* **99**: 572–575; 2007.
2 Peters TJ, Donovan JL, Kay HE, *et al.* The International Continence Society "Benign Prostatic Hyperplasia" study. The bothersomeness of urinary symptoms. *J Urol* **157**: 885–9; 1997.
3 Dray A, Metsch R. Inhibition of urinary bladder contractions by a spinal action of morphine and other opioids. *J Pharmacol Exp Ther* **231**: 254–60; 1984.
4 Rosenberg MT, Newman DK, Tallman CT, *et al.* Overactive bladder: Recognition requires vigilance for symptoms. *Cleveland Clinic Journal of Medicine* **74**: 21–28; 2007.

Paper No: 1149.0

Sugammadex reversal of rocuronium-induced blockade significantly reduces time to patient being operating room discharge ready versus neostigmine or placebo

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Introduction: The selective relaxant-binding agent sugammadex provides significantly more rapid reversal of deep rocuronium-induced neuromuscular blockade (NMB) vs neostigmine[1] or placebo[2]. Here it was investigated whether rapid recovery translates to reduced time to patients being considered ready for operating room (OR) discharge.
Objectives: Times to patients being ready for OR discharge were evaluated in three active-or placebo-controlled studies assessing sugammadex reversal of deep rocuronium-induced blockade[2-4].
Methods: Time from study drug administration to the patient being considered ready for OR discharge was assessed as a secondary endpoint in three studies ($n = 96$, $n = 131$ and $n = 130$) in which sugammadex 4.0 mg/kg was administered at a target of 1–2 post-tetanic counts (PTC) after last rocuronium dose. The respective comparators were: (1) neostigmine 50 mcg/kg administered with glycopyrrolate 10 mcg/kg, according to institution standard practice (primary endpoint was train-of-four (TOF) ratio at extubation)[4]; (2) neostigmine 50 mcg/kg administered with atropine 10 mcg/kg at moderate NMB (reappearance of T2)[3]; and (3) placebo administered at deep NMB (1–2 PTC)[2]. Primary endpoint for the latter two studies was time from study drug administration to recovery to TOF ratio 0.9. Protocol-specified timepoints of sugammadex and neostigmine administration differed as neostigmine is not effective when administered during deep blockade[1].
Results: In each study, geometric mean time to patient being considered ready for OR discharge was significantly faster with sugammadex administered at 1–2 PTC than with comparator (Table): times were (1) 1.3-fold faster vs neostigmine administered according to institution practice ($p = 0.0113$); (2) 1.4-fold faster vs neostigmine administered during moderate NMB ($p = 0.0004$); and (3) 13.3-fold faster vs placebo given during deep NMB ($p < 0.0001$).

Table: Geometric mean (95% CI) time (min) from study drug administration to patient being considered OR discharge ready

Sugammadex Neostigmine		
	n = 50	n = 46
1) Sugammadex at 1-2 PTC vs neostigmine according to institution practice	14 (12-16)	18 (16-20)
Sugammadex Neostigmine		
	n = 66	n = 65
2) Sugammadex at 1-2 PTC vs neostigmine at reappearance of T2	13 (11-15)	18 (16-21)
Sugammadex Placebo		
	n = 69	n = 61
3) Sugammadex at 1-2 PTC 7 vs placebo at 1-2 PTC	(6-10)	99 (89-111)

Conclusion: When sugammadex 4.0 mg/kg was administered during deep rocuronium-induced NMB, there was a significantly shorter time between study drug administration and patient being considered ready for OR discharge, compared with neostigmine (administered according to institution practice or during moderate NMB) or placebo (during deep blockade). This potential time-saving could impact positively on effective use of current OR resources.

References

1 Jones RK, *et al. Anesthesiology*. 2008; **109**: 816–824.
2 Rahe-Meyer N, *et al. Eur J Anaesthesiol* 2011; **201**; Abstract 9AP3–9.
3 Geldner G, *et al. Anesthesiology* 2010; Abstract A528.
4 Sabo D, *et al. J Anesthe Clinic Res* 2011; **2**: 140.

Paper No: 1173.0

The effects thiopental on neural tube development in early stage of chick embryos

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Introduction: Neural tube defects (NTD) are the most common birth defect after congenital heart defects. The etiology of NTD is more complex and plays a role in both genetic and environmental factors. The aim of our study is to determine the effects of thiopental on NTD.early chick embryos by examining histopathologically.

Case presentation: The aim of this study is to demonstrate the effect of thiopental in early stage chick embryos on neural tube development. One hundred specific pathogen-free (SPF) chick eggs were used to investigate the neurulation. SPF eggs were invastigated in four groups. All of the groups were incubated at $37{,}2 \pm 0{,}1\ ^{\circ}C$ and 60 ± 5 % relative humidity for 30 hours and the eighth stage of the embryonic development as defined by Hamburger and Hamilton, was reached. At 30th hour, group A (control group) ($n = 25$) was administered in ovo 0,1 ml saline (%0,9 NaCl) and the other groups were administered same volume of thiopental calculated in increasing dosages for 2 mg/kg, 4 mg/kg, 8 mg/kg for each egg with concentrations of 0,14 mg/0,1 ml Group B ($n = 25$), 0,28 mg/0,1 ml Group C ($n = 25$), 0,58 mg/0,1 ml Group D ($n = 25$) respectively. At the end of 72 hours all of embryos were extracted from eggs and they underwent pathological examination with hematoxilen eosine. While the groups A and B showed no neural tube defects, totally six defective embryos were detected in the groups C and D (two in group C and four in group D). Our Results suggested that thiopental caused neural tube closure defects when injected at supratherapeutic dosage levels. However further studies and different models are needed for its role in neurulation.

Conclusion: If Thiopental is used in the first months of pregnancy, during the organogenesis continues, we think it may have adverse effects on the newborn's development of the nervous system. However, to demonstrate fully the effect of thiopental on development of the nervous system further studies and different models of the embryos are needed.

References

1 Cetinkal A, Colak A, Topuz K, Demircan MN, Simsek H, Berber U, Umur AS, Selcuki M, Vatansever HS. *Turk Neurosurg*. 2010 Apr; **20**(2):111–6. doi: 10.5137/1019-5149.JTN.2659-09.

2 Pamir E, Ali D, Ismail C, Sanli E, Ali K, Mustafa T. *Neurol India*. 2006 Jun;**54**: 178–81.

Paper No: 1188.0

Systemic toxicity with ropivacaine: in reference to a clinical case

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Introduction: Signs and symptoms of local anesthetic (LA) systemic toxicity are exhibited at the level of central nervous system and cardiovascular system, being the first the target of the most frequent toxic replies. Early neurological symptoms such as gustative and/or visual symptoms, changes in the state of consciousness, disturbance, convulsions and coma can coexist with cardiac arrhythmias of difficult reversal or cardiovascular breakdown, eventually culminating in death.1 One of the main mechanisms involved in the LA toxicity is the increase of plasmatic concentration of these drugs in a short period of time, what can occur due to intravascular inadverted injection or higher absorption than expected either in certain routes of administration or overdose.2

Clinical case: Male patient, 57 years old, proposed to diagnostic arthroscopy of the left knee. Medical history of hypertension, type 2 diabetes, chronic obstructive pulmonary disease and anxiety. Weight: 86 kg. Without changes at medical examination, analyses, chest x-ray or ECG. After standard monitoring ultrasound-guided single shot femoral nerve block and subgluteal sciatic block were performed, using a total dose of 40mL of Ropivacaine 7,5mg/mL, without complications. About 10 minutes after the blockades, the patient started sudden psicomotor restlessness, mental confusion with aggressiveness, visual hallucinations, perioral torpidity, disarticulation and bilateral amaurosis accompanied by hypertensive crisis and tachycardia. The surgery was postponed and the patient was transferred to Recovery room for constant cardiorespiratory and neurologic monitoring. Acute cerebrovascular and psychiatric pathology were ruled out. He remained haemodynamically stable and eupneic, without the need of ventilator support. One hour and a half after the beginning of the symptoms, these start to fade away.

Discussion and Conclusions: In spite of taking all precautions, there is always a small amount of LA that reaches other organs, being the symptoms mainly neurological, with or without cardiovascular involvement. Despite the security given by echographic technique, the maximum recommended doses should always be respected (in this case was exceeded) due to the risk of happening systemic toxicity. In these case, the patient should stay under unremitting cardiovascular and neurologic monitoring, must be vigorously hydrated and lipid rescue should be available. Treatment may be supportive and symptomatic, but it may be

necessary to guarantee an advanced airway or even try to reverse a cardiopulmonary arrest, reasons why an intubation set and emergency drugs should be prepared and near the patient.

1 *Clinical Anesthesia*, 2009; Section IV, **21**: 542–545.
2 *Miller's Anesthesia*, 2010; **30**: 923–924, 931–934.

Paper No: 1197.0

Does oral clonidine premedication in hypertensives & normotensives improve the hemodynamic stability during intubation?

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Laryngoscopy and orotracheal intubation are associated with haemodynamic changes due to sympathetic stimulation which can be attenuated by a variable combination of drugs. Clonidine, an alpha-2 adrenoceptor agonist, is known to suppress hemodynamic response to intubation. Whether, this suppression is similar in hypertensive patients as compared to normotensive patients is not clear. We therefore studied hemodynamic responses in hypertensives & normotensives during intubation with oral clonidine premedication.
Methods: 80 of ASA grade 1 & 2 patients were assigned randomly into one of the following groups normotensive control (N), normotensive clonidine (NC), Hypertensive control (HT), Hypertensive patients clonidine (HTC). Hemodynamic parameters like Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP) and mean arterial pressure (MAP) were recorded before induction, before intubation (baseline), and each minute after intubation for the first 10 minutes, and thereafter every 5 minutes for the first 30 minutes. Data was analyzed by using ANOVA, multiple paired t-tests Student's t-test, and Chi-square test.
Results: In Normotensive group (N & NC), the hypertensive responses to intubation were attenuated in the clonidine group as compared to the control group ($P < 0.01$). There was a significant difference with respect to SBP, DBP & MAP between the two groups normotensive group ($p < 0.05$). In hypertensives group (HT & HTC) clonidine group showed exacerbated haemodynamic changes as evidenced by wide fluctuation in SBP (increase by 55 ± 28vs38 ± 23 mmHg, $p = 0.04$), DBP ((increase by 31 ± 14vs24 ± 6 mmHg, $p = 0.16$) and MAP (increase by 39 ± 19vs27 ± 18 mmHg, $p = 0.04$), seen after induction and intubation. Further analysis was done by cross-comparing the two control groups (NvsHT) and two clonidine groups (NCvsHTC). There was a no significant difference in the hemodynamic responses between the control groups. Comparison of clonidine groups showed exaggerated response in hypertensives (increased by 55 ± 28mmHg) when compared to the normotensives (increased by 55 ± 28mmHg Vs 32 ± 14, $P = 0.05$). There was no significant difference in the HR among the groups ($p = 0.22$)
Discussion: The exaggerated pressor response seen in hypertensives who received clonidine may be because, the dosage of clonidine was too low (1.75ug/kg) to cause any hypotensive effects in hypertensive patients who already might have had presynaptic á-2 receptor desensitization because of increase in the basal catecholamine levels.1 Also, the low doses of clonidine could have potentiated the pressor responses caused by increased release of catecholamines known to occur in hypertensive patients following stimulation.2
Conclusion: We conclude that oral premedication with clonidine 100 μg attenuates the haemodynamic responses to intubation in normotensives, but in hypertensives it seems to exaggerate the pressor responses.

References

1 *Arch Mal Coeur Vaiss* 1992; **85**: 1149–51.
2 *Hypertension* 1983; **5**: 552–9.

Paper No: 1201.0

Local infiltration analgesia in hip arthroplasty : A pharmacokinetic study of ropivacaine

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Introduction: A recently developed and increasingly popular method for postoperative analgesia following total hip arthroplasty(THA) is Local Infiltration Analgesia (LIA) with ropivacaine, ketorolac and epinephrine. This method is considered to have certain advantages, which include administration at the site of traumatized tissue, minimal systemic side effects, faster postoperative mobilization, earlier postoperative discharge from hospital and less opioid consumption. One limitation, which may prevent the widespread use of LIA is the lack of information regarding plasma concentrations of ropivacaine, which may cause cardiac arythmias.
Objectives: The aim of this academically initiated study was to detect any toxic or near-toxic plasma concentrations of ropivacaine following LIA after THA.
Methods: Fifteen patients scheduled for primary total hip arthroplasty under spinal anesthesia, received local

infiltration analgesia with a mixture of ropivacaine 200 mg, ketorolac 30 mg and epinephrine 0.5 mg. Total and free plasma concentration of ropivacaine was quantified by liquid chromatography- mass spectrometry (LC-MS). In addition, since ropivacaine has been shown to bind to alpha 1 glycoprotein, this protein was analyzed as well.

Results: The maximal ropivacaine plasma level was detected during the first 2-4 hours after infiltration. In the first five patients analyzed, none had potentially toxic plasma levels.
Conclusion: Since the maximal ropivacaine level following LIA is detected around 2-4 h after infiltration, cardiac monitoring should cover this interval.

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BJA

REGIONAL ANAESTHESIA AND ACUTE PAIN

(The names of the authors presenting each paper are shown in bold type)

Paper No: 30.00

Study on prophylactic impact of ondansetron IV on intrathecal fentanyl-induced pruritus

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Introduction: Adding opioids to local anesthetic solutions leads to enhanced anesthesia and provide postoperative analgesia.Spinal opioids have some side effects,though.One of them is pruritus.Ondansetron(5HT3-receptors agonist) has whelming effect on itching.
Objective: We designed a randomized, double-blinded, placebo-controlled study to evaluate prophylactic impact of ondansetron (IV) on intrathecal fentanyl-induced pruritus.
Methods: 207 ASA I-II-III patients candidate for pelvic or lower limb operations had undergone spinal anesthesia (10–15mg hyperbaric bopivacain and 25fÝg fentanyl intrathecal) and were divided randomly into two groups: Case (ondansetron 8mg IV) and Control (normal-salin 2cc IV). Systolic blood pressure, pulse rate and side effects were documentated in 5 min,10 min,30 min,60 min and every one hour till 6 hours after operation.Pationts were asked about existence, severity and site of pruritus 2 and 6 hours after operation.
Results: Incidence of pruritus was 60% and 34%, respectively, in placebo group and Ondansetron group. 6% in Ondansetron group and 18% in placebo group had sever itching. 94% of patients with itching in placebo group had pruritus in dermatoms above T6, but 73% of patients with itching in Ondansetron group had pruritus in dermatoms T6–L1.The incidence of PONV was 38% and 10%, respectively, in placebo and Ondansetron group.The incidence of PONV in placebo group was higher ($P<0.05$).The incidence of other side effects were same in both group.
Conclusion: Ondansetron reduces the incidence and severity of interathecal fentanyl-induced pruritus (specially in dermtoms T6–L1) and PONV. However, it makes no change in systolic blood pressure, pulse rate, block time, painless duration and incidence of urinary retention and backache.

Paper No: 53.00

Ketamine as adjunct to bupivacaine in paravertebral analgesia for breast Surgery

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Introduction: Paravertebral block (PVB) given prior to induction of general anaesthesia (GA), for breast surgery is known to provide improved intra-operative and post-operative analgesia, decreased incidence of nausea and vomiting, reduced surgical stress response and improved patient satisfaction.1 Adjuvants like fentanyl and clonidine have already been used along with local anaesthetic in the paravertebral space for breast surgery and have been found to prolong the duration of analgesia.2 Background and Objectives. This study was conducted to evaluate the effect of addition of ketamine to bupivacaine in paravertebral analgesia in patients undergoing Modified Radical Mastectomy (MRM) under General Anaesthesia (GA).
Methods: This was a double blinded prospective randomized control trial. 40 ASA I and II patients scheduled for MRM were randomly allocated into two groups: Group A who received single shot Thoracic Paravertebral Block (TPVB) at T4 level with 0.3mlkg-1 0.25% bupivacaine prior to induction of GA; Group B who received ketamine 0.5mgkg-1 in addition to 0.3mlkg-1 0.25% bupivacaine in the paravertebral space. Balanced anaesthesia technique for surgery was used in both the groups. Intra-operatively, rescue analgesia was provided with fentanyl 2mcgkg-1; post-operatively all patients were provided with Patient Controlled Analgesia (PCA) with morphine.
Results: Intra-operative fentanyl consumption was less in Group B (32 ± 27.644) as compared to Group A (37.5 ± 31.43), but this was not statistically significant ($p=0.56$). 24 hours cumulative post-operative morphine consumption was also found to less in Group B (17.95 ± 10.4) compared to group A (23.45 ± 16.656), but this was also not statistically significant ($p=0.218$).
Discussion. In the present study, ketamine, as an adjuvant to local anaesthetic in the thoracic paravertebral space, did not significantly potentiate the efficacy or duration of analgesia of bupivacaine. Single-injection PVB at T4 level was found

to be an equally suitable alternative to GA in women undergoing breast surgery by Pusch et al; while multi-segmental spread of local anaesthetic in the paravertebral space following a single shot PVB has been confirmed by Saito et al.3,4 And this multi-segmental spread is facilitated by nerve stimulator guided technique.4 Hence we used nerve stimulator guided technique. No incidence of any side effect was observed in our study. This might be attributed to the enhanced safety associated with nerve-stimulator guided technique.

Conclusion: In conclusion, addition of 0.5mgkg-1 ketamine to 0.3mlkg-1 0.25% bupivacaine in TPVB for MRM decreases 24 hours post-operative morphine consumption by 5.5mg, but this is not statistically significant.

References

1 Roy Greengrass, Christina R, Weltz J, Dirk Iglehart. Use of Paravertebral Block Anesthesia in Surgical Management of Breast Cancer: Experience in 156 cases. *Annals of surgery* 1998; **227**: 496–501.

2 Burlacu CL, Frizelle HP, Moriarty DC. Fentanyl and clonidine as adjunctive analgesics with levobupivacaine in paravertebral analgesia for breast surgery. *Anaesthesia* 2006; **61**: 932–937.

3 Pusch F, Freitag H, Weinstabl C. Single-injection paravertebral block compared to general anaesthesia in breast surgery. *Acta Anaesthesiol Scand* 1999; **43**: 770–4.

4 Saito T, Den S, Cheema SPS, *et al.* A single injection multisegmental paravertebral block extension of somatosensory and sympathetic block in volunteers. *Acta Anaesthesiol scand* 2001; **45**: 30–33.

Paper No: 116.00

Thoracic paravertebral block vs. transversus abdominis plane block in major gynecological surgery. A prospective, randomized, controlled, observer blinded study

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Introduction: Patients undergoing major abdominal surgery often receive an epidural infusion for postoperative analgesia. However, in some clinical situations where epidural analgesia is contraindicated or unwanted, the systemic administration of opioids is the usual means used to relieve postoperative pain. Various regional analgesia techniques used in conjunction with systemic analgesia have been reported to reduce the cumulative postoperative opioid consumption and opioid-induced side-effects.

Objective: The objective of this prospective, randomized controlled trial was to assess the effectiveness of transversus abdominis plane block and paravertebral block in woman undergoing major gynecological surgery.

Methods: We analyzed 58 patients who were all equipped with a patient-controlled postoperative analgesia pump (PCA) that delivered ketobemidon. In addition, some patients were randomized to either receive a bilateral transversus abdominis plane block (n=19) or bilateral paravertebral block at the level of Th10 (n=19). Both blocks were performed preoperatively as single-injection of bupivacaine (1.875 mg/kg). Postoperative pain scores at rest and while coughing, cumulative ketobemidon consumption and PONV scores were assessed by a blinded observer at 2, 4, 6, 24 and 48 hours postoperatively.

Results: Both methods of inducing block were associated with significant reductions in pain score and cumulative opioid consumption throughout the study period compared to the control (PCA only) patients. PONV scores were low in all groups, but during the early postoperative period (6 hours) more control group patients needed antiemetics compared to the treatment groups. No complications were registered.

Conclusion: Both transversus abdominis plane block and paravertebral block can be used as effective analgesia adjuncts in woman undergoing major gynecological surgery. Although in our study thoracic paravertebral block appeared to be more effective than transversus abdomins block, the later performed under ultrasound guidance seems to be more controlled and safe alternative.

Paper No: 130.00

Pharmacokinetics and clinical study of different concentrations of epidural ropivacaine for labor analgesia

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Background and Objectives. Effective pain relief and minimal motor block are the necessary ingredients of an ideal epidural block for labor analgesia (1) ¬. Bupivacaine is the most commonly used local anesthetic agent for this purpose. The search for alternatives with less central nervous system and cardiovascular toxicity than bupivacaine has resulted in the production of two relatively new amide

local anesthetic agents, namely ropivacaine and levobupivacaine (2). There are fewer data available on the addition of fentanyl to ropivacaine for epidural infusions for labor analgesia when using ropivacaine in different concentrations with and without the addition of fentanyl (3). Ropivacaine is used in concentrations of at least 0.2%, with or without opioids, for labor epidural analgesia. Smaller concentrations of ropivacaine (0.08%– 0.125%), administered via a patient-controlled epidural analgesia (PCEA) device, were found to be effective, providing both a decreased motor block and risk of toxicity (4). The aim of our study is to investigate the plasma concentrations of ropivacaine and to assess maternal and fetal outcomes after extradural injection of different concentrations of ropivacaine for analgesia of labor pain as well as the analgesic efficacy, sensory, motor dealing out and maternal outcome.

Methods: Methods: 60 ASA physical status I or II parturients with singleton fetus in vertex presentation were divided into 3 groups (20 parturients each) and received ropivacaine 0.2% (group I), ropivacaine 0.15% with fentanyl 2 μg/ml (group II) or ropivacaine 0.1% with fentanyl 2 μg/ml (group III) epidurally. Visual Analogue Scale (VAS), heart rate (HR), mean blood pressure (MBP), arterial blood gases (ABG), sensory and motor levels were recorded while the parturient is in the supine position with a 30? wedge under the right hip to allow a left lateral tilt. Maternal and umbilical venous blood samples were withdrawn to assess plasma ropivacaine concentrations at 20 minutes, 1 hour, at delivery.

Results: All solutions provided effective analgesia during labor, with all groups requiring similar numbers of top-up doses. No statistically significant differences in the mean values of VAS, HR, MBP, and ABG, sensory or motor levels were found among the 3 groups at all investigated time intervals. Maternal and fetal outcomes and patient satisfaction were similar among groups. Maternal venous plasma concentrations of ropivacaine were greater in the first group compared with other groups.

Conclusion: We conclude that decreasing concentrations of epidural infusion of ropivacaine to 0.15% or 0.1% can provide adequate analgesia during labor, and the addition of fentanyl 2 μg/ml to the smaller concentrations can improve analgesia to a quality similar to ropivacaine 0.2% alone.

Keywords: Epidural analgesia; Obstetrics; Ropivacaine; Fentanyl

Paper No: 165.00

Spontaneous Cerebrospinal Fluid Fistula

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Introduction: Spontaneous intracranial hypotension syndrome is a side condition to the loss of cerebrospinal fluid resulting from congenital malformations affecting the dura mater, generating fistulas. The main feature is orthostatic headache. It is diagnosed on the basis of clinical findings and cerebral magnetic resonance imaging, nuclear cisternogram and myelogram, which is most useful to identify fistulaes (1). Due to potential multiple dural defects, the treatment selected (epidural blood patch, percutaneous fibrin glue therapy or the surgical repair of dural defects) may be insufficient due to an inaccurate spotting of dural defect(s).

Case 42 year-old male patient, caucasian, 6 ft 2 in tall, weighs 99 kg. Reasons for consultation were frontal headache, neck stiffness, cervicalgia (10/10) at a standing position and emesis during four weeks, which disappears in supine position. Initial MRI of the brain revealed cerebral venous sinus thrombosis and bilateral subdural hematomas. Physical examination: Glasgow 15/15, vital signs within normal limits, muscle cervical spasm and suboccipital pain. Diagnosis: Spontaneous intracranial hypotension syndrome? As headache persisted; cerebral magnetic resonance imaging, showed herniation of the amygdales and left transverse sinus thrombosis. A myelogram and a CT scan were performed. As a result, a 20 ml blood patch was performed at L1–L2, using fluoroscopy and epidurogram to provide location. Patient was able to take a standing position, but 48 hours after the procedure he suffered from headache, leading to a second epidural blood (15ml) patch at the previews level with trasient recovery for 24 hours; hence, a nuclear cisternogram was performed showing CSF leaks at C7–T1. A new blood patch was performed (2 days after the second blood patch), after which patient reported 70% recovery. Patient was subsequently discharged. He returned when symptoms reappeared. Bilateral laminectomy at the C8 root exit and fistula correction were performed, after which he evolved with minimal headache.

Discussion: This case reveals the usefulness of nuclear cisternogram in diagnosis and treatment. The consequences of spontaneous CSF fistulae include the risk of meningitis, a fact that calls for a fast, accurate treatment. For this patient, the most efficient means of diagnosis was nuclear cisternogram with a contrast medium, which made it possible to get a view of the fistulae.

Conclusion: Nuclear cisternogram guides the performance of a blood patch or surgical repair by increasing their effectiveness, and it is recommended as a first line diagnostic tool.

Keywords: Myelogram; blood patch; headache; Colombia

Paper No: 193.00

Accidental catheterization of the epidural venous plexus: tomographic analysis

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Introduction: Unintended epidural vein injury complicates as many as 9 % of lumbar epidural catheter placements. If unrecognized, the consequences of intravascular local anesthetic administration can be life-threatening, including seizures, cardiovascular toxicity and cardiovascular colapse.
Objective: The purpose of this report is to describe a case of accidental catheterization posterior epidural venous plexus and its registration with computed tomography with injection of iodinated nonionic contrast through the epidural catheter.
Mehods - Case report: Patient aged 63 years, physical status II (ASA), underwent conventional cholecystectomy under general balanced anesthesia and epidural. In the left lateral position was performed puncture of the epidural space between T11 and T12, with the loss of resistance test positive and negative aspiration for blood or spinal fluid, using a 16G Tuohy needle with the bevel oriented cephalad portion. After the puncture, given 3cc of 2% xylocaine with epinephrine, as has not been observed changes in heart rate or electrocardiographic trace was followed by injection of 20ccl of ropivacaine 0.5%, and then proceeded to introduce 16G epidural catheter with the purpose of postoperative analgesia. After the introduction of the catheter, the aspiration of liquid reflux was observed with a small amount of blood. Fixed catheter skin, and with the patient in the supine position was held then balanced general anesthesia with propofol, fentanyl and sevoflurane. Surgical procedure was uneventful. At the end of the surgery performed by the new aspiration catheter, when there was again blood reflux. Given 3cc xylocaine with epinephrine through the catheter, and then observed a 40% increase in heart rate. After the surgery, the patient was extubated. Lucid and oriented, and spontaneous ventilation, was referred to the radiology sector. Directed spiral computed tomography with injection of iodinated nonionic contrast 4cc by epidural catheter. Analysis of images reveals the path of the catheter from the skin to the epidural space. By way of contrast injection was possible to observe the internal epidural venous plexus anterior and posterior. Identified the intervertebral vein from its origins in the intervertebral foramen to its confluence with the azygos vein. Performed at catheter removal without complications. The patient had good clinical outcome.
Conclusion: The incidence of the catheterisation procedure epidural venous plexus can occur even when complied with the procedures recommended. You can document the actual placement of the epidural catheter and the occurrence of venous catheterization using helical computed tomography with injection of iodinated nonionic contrast through the catheter.

References

1 Mhyre JM, Greenfield MLVH, Tsen LC, Polly L. A systematic review of randomized controlled trials that evaluate strategies to avoid epidural vein cannulation during obstretric epidural catheter placement. *Obstetric Anesthesiology* 2009; **108**: 4: 1232–42.
2 Hogan Q – Epidural catheter tip position an distribuition of injectate evaluated by computed tomography. *Anesthesiology* 1999; **90**: 4: 964–70.
3 Rodgers A, Walker N, Schug S, McKee A, *et al.* – Reduction of postoperative mortality and morbidity with epidural or spinal anaesthesia: results from overview of randomized trials. *BMJ* 2000; **321**: 1493.

Paper No: 220.00

Postoperative subdural analgesia with tramadol vs morphine in intertrocanteric fracture of hip

Edgar Omero and **Ortega Ortega**

Postoperating Analgesia Subdural With Tramadol Versus Morphine In Hip Fracture IntertrocantéRica.

Introduction: The present work is a controlled clinical trial in phase IV of investigation whose objective was to evaluate the post operating analgesia by Tramadol, as well as its duration an intensity with identification of undesirable effects, in comparison with Morphine, both applied by subdural route and in combination with anaesthetic premises. The research was conducted in a universe of patients who were put under surgery for intertrocanteric fracture of hip.
Methods: It was conducted a randomized, prospective, descriptive and inferential simple blind person study to 100 patients announced for elective surgery in the "Arnaldo Milián Castro " hospital in the included/understood period from January 2008 to December 2009, the sample was divided in two groups 50 patients each one. Group T: Tramadol 20mg+Bupivacaina 5mg+Hyperbaric Lidocaina 80mg.
Group M: Morphine 0.2 mg+Bupivacaina 5mg + Hyperbaric Lidocaina 80mg
Results: Related to the duration of the post operating analgesia, one was that it was similar in both groups, Group M (Morphine) with an average duration of 18 ± 4.5 hours and group T(Tramadol) with an average duration of 18 ± 3.6 hours, In reason of these results the patients required rescue analgesia, which has been considered insufficient analgesia.
Discussion: The hemodynamic behaviour was similar in both groups, it did not appear marked hypotension in any patient, neither was necessary to use vasopresors in any case due to a very important factor as intra vascular filling before the subdural blockade. However, group T (Tramadol) showed a notably smaller incidence of adverse reactions in comparison with group M (Morphine). The amplitude of dose rank of Hyperbaric Lidocaine associated with Bupivacaina enhances the anaesthesias duration and the necessary post operatory analgesia in order to provide comfort for as long as the required time of hospitalization without showing neurological symptoms that could suggest adverse effects.
Conclusion: This clinical trial demonstrated that the Tramadol is an excellent alternative analgesic by subdural route

and must be catalogued as a new anaesthetic technique in combination with anaesthetic premises in elderly patients with intertrocanteric fracture of the hip since besides offering duration of an acceptably lasting post operating analgesia of up to twelve hours, with a good hemodynamic stability has less adverse reactions than Morphine.

References

1 Frika N, Ellachtar M, Mebazas MS. Combined spinal –epidural analgesia in labour comparison of Sunfetanil vs Tramadol . Middle East J. *Anaesthesiology* 2007; **19**(1); 87–96.

2 García Guiral M. Estudio clínico randomizado de efectos en el neonato tras la administración intratecal de opioides en cesáreas electivas: Tramadol frente a fentanilo. IV Congreso de la Sociedad del dolor. *Málaga*; 1999. p 54–66. 1

3 Minami K, Uezono, Ueta Y. Pharmacological Aspects of the effects of Tramadol on G-Protein Coupled receptors. *Journal of Pharmacological Sciences* **103** (3): 253–260, Mar 2007.

Paper No: 221.00

Comparison between intrathecal morphine combined with IV-fentanyl PCA and thoracic epidural PCA in patients undergoing gastrectomy

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Background. Patient-controlled epidural analgesia is widely used because of its excellent pain relieving effect even with small amount of opioids. ? However, for patients undergoing gastrectomy, it must be done via thoracic epidural space which is known to be most difficult and also consumes a lot of time, causes discomfort and many side effects by the catheter itself. ? Meanwhile, intrathecal morphine and IV-fentanyl patient controlled analgesia has been proved to provide effective pain relief for patients undergoing many types of surgery ? Above all, intrathecal injection is easy and has less complication because it is usually done via L3–4 or L4–5. ? There is no study yet comparing the analgesic effect between patient-controlled thoracic epidural analgesia (PCEA) and intrathecal morphine+IV patient-controlled analgesia with fentanyl (ITM-IVPCA) for patients undergoing gastrectomy. ? Therefore, the aim of this study is to compare the analgesic effect and side effects between these two methods.
Methods: Materials ? 60 patients(>20yrs,ASA I/II) undergoing gastrectomy due to gastric cancer were included and randomly allocated into ITM-IVPCA (IT group) or PCEA group(EP group) ? Methods ? IT group: Intrathecal administration of morphine 0.3mg at L3/4 level before induction. IV PCA (fentanyl 20§¶/kg, 5 mL/hr, blous 0.5mL, LOT; 15 min) and ramosetron 0.3mg IV during peritoneal closure. ? EP group: Epidural catheter insertion at T8/9 or T9/10 level and administration of 0.2% ropivacaine 5ml through epidural cathter before induction. PCEA(0.2% ropivacaine 250mL+ fentanyl 20§¶/kg 5 mL/hr, bolus 0.5mL, LOT; 15 min) and ramosetron 0.3mg IV during peritoneal closure. ? Assessments Subjective discomfort during procedure, procedure time, pain score until 48hrs after surgery (NRS) and adverse effects (nausea and vomiting, pruritus, sedation).
Results: There are no difference in analgesic effect between the IT group and the EP group. However, the 95% confidence interval of the median treatment differences regarding NRS scores at rest on the first postoperative day failed to demonstrate non-inferiority of the ITM-IVPCA. ? The procedure for Intrathecal injection takes shorter time and makes patients more comfortable compared to that for epidural catheter insertion. ? The IT group shows more nausea and sedation, but there are no significant differences in vomiting, pruritus and headache between the two groups. ? Postoperative recovery of bowel movement is comparable between the groups.
Conclusion: In patients undergoing gastrectomy, intrathecal morphine+IV patient-controlled analgesia with fentanyl is not as effective as patient-controlled thoracic epidural analgesia.

Paper No: 237.00

Anterior peribulbar block. The perfect tecnique?

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Introduction: At present topical anesthesia is common in cataract surgery. Nevertheless, some ocular pathologies require regional anesthesia.
Objective: The aim of this study is to obtain an effective and safe technique such as the anterior peribulbar block, avoiding the complications of retrobulbar anesthesia, for those ophtalmological surgeries that cannot be carried out with topical anesthesia.
Methods: We have developed a prospective study with 34 patients subjected to ocular surgery with an anterior peribulbar block. We used a short 16 mm needle and a small volume (5 ml) of a mixture of anesthetics which has not yet been used (lidocaine to 2.5%, bupivacaine to 0.375% and 150 units of hyaluronidasa). The injections were performed at two sites, medial and inferolateral, as in the classic technique. Later, we placed Honan's balloon during 5 minutes at a pressure of 30 mm of Hg. An experienced ophtalmologist valued the akinesia and the presence of complications (chemosis, orbital haemorrage, globe perforation). After the intervention the patient was asked if he had had pain (verbal simple scale) or amaurosis during the intervention.
Results: 100% of the patients had a total akinesia and 85.3% amaurosis, an a reinjection was not necessary in any case. 86.5% did not suffer pain. No patient had chemosis or any

other complication. Six patients subjected to vitrectomy had mild pain and one suffered moderate pain at the end of the intervention. The only rescue technique used was topic lidocaine. Only one patient subjected to scleral buckling and vitrectomy had intraoperative severe pain from the beginning of surgery. From that moment the patients subjected to scleral buckling were taken out of the study.

Conclusion: We have not found in literature as high a percentage of succes as we have found in our study. Both the excellent results in effectiveness and the absence of complications make this technique ideal for cataracts surgery and vitrectomys, excluding scleral buckling which will surely need higher doses of anesthetics, as we will verify in future studies.

References

1 Scott RA, Jakeman M, Perry SR, Acharys PA. Peribulbar anaesthesia and needle length. *J R Soc Med*. 1995; **88**: 594–596.

2 Demediuk OM, Dhaliwal RS, Ranjit S, Papworth DP, Devenyi RG, Wong DT. A comparison of Peribulbar Anesthesia for Vitreoretinal Surgical Procedures. *Arch Ophtalmol*. 1995; **113**: 908–913.

Paper No: 256.00

The Effect of Spinal Anesthesia and Intrathecal Clonidine on Propofol Hypnotic Requirements for Conscious Sedation

Lee Heon Keun

Introduction: It is stated frequently that patients with spinal block may be drowsy, although they may not have received any sedative drugs. Intrathecal clonidine increase the duration of sensory and motor blockade, and also have sedative effect.

Objective: We have conducted a study to investigate the effect of spinal anesthesia and intrathecal clonidine on propofol hypnotic requirement.

Methods: Forty-five adult patients scheduled to undergo local or spinal anesthesia were enrolled in this study. Target controlled infusion (TCI) of propofol was started at a target concentration of 1 §¶/§¢ and we checked lowest BIS during 5 min observation after effect site concentration (Ce) was reached at 1 §¶/§¢. And then TCI of propofol was restarted at a target concentration of 1.5 §¶/§¢ and we checked lowest BIS during 5 min observation after Ce was reached at 1.5 §¶/§¢. And we checked Ce that the BIS was reached at 80 and 70 during observation.

Results: The minimum BIS at 1 §¶/§¢ Ce¡¡was 86.9 ¡¾ 11.3 (Group 1), 80.5 ¡¾ 8.5 (Group 2), 66.9 ¡¾ 15.5 (Group 3) and the minimum BIS at 1.5 §¶/§¢ Ce was 76.0 ¡¾ 13.4, 62.9 ¡¾ 12.4, 48.5 ¡¾ 13.7 respectively. The Ce of propofol that BIS 80 was checked at first was 1.4 ¡¾ 0.5 §¶/§¢ (Group 1), 1.1 ¡¾ 0.3 §¶/§¢ (Group 2), 0.8 ¡¾ 0.3 §¶/§¢ (Group 3) and the Ce of propofol that BIS 70 was checked at first was 1.8 ¡¾ 0.6 §¶/§¢, 1.4 ¡¾ 0.3 §¶/§¢, 1.0 ¡¾ 0.3 §¶/§¢ respectively. The Ce value of Group 2 and Group 3 at the BIS 80 is statistically lower than the Group 1 ($P<0.05$), and the Ce value of Group 3 at the BIS 80 is statistically lower than the Group 2 ($P<0.05$). The Ce value of Group 2 and Group 3 at the BIS 70 is statistically lower than the Group 1 ($P<0.05$), and the Ce value of Group 3 at the BIS 70 is statistically lower than the Group 2 ($P<0.05$).

Conclusions: Spinal anesthesia and intrathecal clonidine reduce the requirement of propofol for conscious sedation, and the Ce of propofol for conscious sedation is 1.4–1.8 §¶/§¢ at local anesthesia, 1.1–1.4 §¶/§¢ at spinal anesthesia with 0.5% hyperbaric bupivacaine, 0.6–1.0 §¶/§¢ at spinal anesthesia with 0.5% hyperbaric bupivacaine and 75 §¶ clonidine.

Paper No: 300.00

Posterior tibial nerve (ptn) block with single-shot or with catheter injections at the medial malleolus. Simple, effective and original technique

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Introduction: There are several maneuvers for blocking the PTN: paresthesia/disestesias, eletric stimulation and ultrasound techniques. A new loss of resistance (LOR) technique is presented for blocking PTN.

Objective: Evaluate the performance and effectiveness of the technique in which the LOR was the end point of the puncture. Description of the technique: After informed consent, IV access and habitual control of the vital signs, two patients with extent sole trauma were positioned in supine, foot rotated externally, puncture determined by flexing/extending the toes and/or palpation the posterior tibial artery (PTA). After 1.0 mililiters (ml) of 0.5% lidocaine 1:100.000 with epinephrine (Ld+), skin and subcutaneous were infiltrated with an insulin needle. A needle 22-G, 1.5 cm attached to an appropriated five ml glass syringe with 0.3 – 0.5 ml of air under low digital pressure was slowly advanced in a 20° angle with the skin posterior to the PTA, until LOR is perceptible after trespassing the deep fascia. With the needle "in situ", the LOR syringe is replaced by a syringe contend 8 ml of Ld+ 1.5% 1:150.000 and after aspiration, 3 ml test dose and additional 5 ml were injected. For continuous/intermittent analgesia/anesthesia, a new puncture with a short 22-G venous catheter is accomplish in a more cranial coronal plane and introduced without the needle. After the above Ld+ test dose, subsequent 6.0–7.0 ml 0.25% bupivacaine (Bp) was injected. The catheter is fixed with "micropore" keeping it pervious for subsequent doses. Computed Tomographic Images (CTI) were performed to confirm placement of the catheter and to delineate the spray of local anesthetic with 3.0 ml of Iopamiron 300 diluted with 3 ml of

saline (figure). Catheters more than 60 hours of use where removed and send for bacterial and cultural exam. To predict the effectiveness of the block we measured both, analgesia (0=no; 1=partial; 2=complete) and indirectly by patien's satisfaction (0=no; 1= partial; 2=complete).
Results: Patien's analgesia and satisfaction were 2. PTB latency was 13 min and extended analgesia was up to 12–14 hours with Bp. No bacterial agents were found.
Discussion: CTI showed the contrast in the right fascial plane where the PTN and PTA transit. Conclusions: The PTB with LOR endpoint puncture seems to be feasible, although more blocks are needed to confirm the performance of the technique.

Paper No: 313.00

Perioperative analgesia in open liver resection

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Introduction: The goal of the anesthesiologist consists of optimize the surgical procedure until full recovery of de patients is achive, and also to individualize the treatment according to different factors that may influence the quality and intensity of acute postoperative pain.
Material and methods. A prospective study of all patients who underwent conventional liver resection managed in the Acute Postoperative Pain Unit (APPU) in 2010 was carried out. The analgesic technique that was used: metameric or no metameric epidural PCA, or intravenous morphine chloride PCA always in a multimodal context.
Results: 61 patients were operated. The mean age was 58.3 years, with 52% male and 48% women. The 57.37% were ASA III. The used treatment was thoracic epidural (T7–T9) at 96.74%, epidural lumbar (L1–L2) at 1.63% and intravenous analgesia using PCA morphine chloride at 1.63%. The median EVN at admission in the PACU ward was 3.2 and at discharge less than <3, including rest and active patients in 97%. The most common adverse effect related to treatment were nausea and vomiting in 13.1%, follow by the removal of the epidural catheter in 4.9% and pruritus in 3.2%. No major complications in the postoperative period of patients depending from the anesthesia technique, analgesia or surgical were observed.
Conclusion: Metameric epidural analgesia continues to be the gold standard for open abdominal surgery . Despite most of the patients are elderly and included in group ASA III the risk-benefit was outweight and decided to use invase techniques obtaining better outcomes.We most always remember that all treatments should be individualized and apply within a multimodal and multidisciplinary context.

Bibliography

1 Esteve Pérez N, *et al.* Postoperative analgesia in major surgery: is it time to change our protocols? *Rev Soc Esp Pain* 2009, **16** (4): 239–245
2 Seller Losada JM, *et al.* General-epidural anesthesia combined versus general anesthesia, morbidity, and analgesic efficacy in the thoraco-abdominal surgery. Systematic review meta-analysis. *Rev Esp Anesthesiology* 2008; **55** (6): 360–366

Paper No: 321.00

Independent predictors for Postoperative Severe Pain in Gynecological surgical patients

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Introduction: Recent advances in perioperative pain management have relieved much of the suffering among surgically treated patients, but still there are many complications related with insuffient pain control. A better understanding of the predictors of postoperative pain can give more clues towards its management. The study aim was to determine the possible independent predictors for postoperative severe pain (POSP) in Post Anesthesia Care Unit (PACU) patients who underwent general anesthesia for gynecological surgery.
Objective: A prospective observational study was conducted at Tongji Hospital, Wuhan, China from January 2009 to July 2010. Total 1020 females undergoing gynecological surgery and transferred to PACU postoperatively were recruited in this study. Inclusion criteria were patient¡s age above 18 years, without any communication problems and intact cognitive function to provide a pain score.
Method. To evaluate presence of POSP, we used Numerical Rating Scale (NRS) ranging from 0 as ¡°no pain at all¡ to 10 which is unbearable pain on arrival postoperatively in PACU. NRS ¡Ý7 score was common break point for defining severe pain. We also assessed preoperative and intraoperative events and their roles on POSP.
Results: Data from 1020 patients was analyzed in the study. 184 [18%] patients experienced NRS ¡Ý7. On univariate analysis, our study showed significant differences with age, cancer, invasive surgeries, duration of the surgical procedure, anesthesia maintenance, intraoperative fluid load and loss, blood loss, PONV prophylaxis, PCA, NSAIDs

analgesia before emergence between the POSP and non-POSP group.When these factors entered the logistic regression model, the following variables were found to be independent predictors for POSP :Cancer (OR=1.66 [1.026–2.698], p=0.039, Invasive surgery (OR=1.671 [1.026–2.640] p=0.028) and Longer Operation Duration (OR=1.774 [1.209–2.602] p=0.028). Patients with POSP experienced long PACU stay (28.1 min versus 31.2 min, p=0.006), postoperative hospital length of stay (7.7¡À 5.1 day versus 9.8 ¡À 6.5 day, P<0.001), total hospital length of stay (12.6 ¡À 7.1 day versus 14.9 ¡À 9.2 day, p< 0.001) and higher cost of health expenses (RMB 18514.0 ¡À 12699.0 versus RMB 23904.9 ¡À 24352.6, p<0.001).

Conclusion: We conclude that patients with cancer, invasive surgery and longer operation duration were significantly independent predictors for POSP. It was effecting on PACU discharge, hospital length of stay and additional health expenses.Consequences of POSP are significant not only from the patient¡s point of view, but also from the perspective of health economic by resulting in increased direct and indirect costs.

Paper No: 324.00

Epidural bupivacaine concentrations for intraoperative analgesia during abdominal aortic surgery: a prospective, randomized study

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Introduction: Thoracic epidural analgesia combined with light general anaesthesia is an established anesthetic management for abdominal aortic surgery. However, still there is controversy about site, dose and concentration of the local anesthetic used in thoracic epidural anesthesia.

Objective: We compared the effects of epidural anaesthesia with two different concentrations of bupivacaine on sevoflurane requirements and haemodynamic variables during abdominal aortic surgery under combined epidural/general anaesthesia with state entropy score kept within the range 40–60.

Methods: Sixty patients undergoing abdominal aortic surgery were randomly divided into two groups to epidurally receive 0,125% bupivacaine (Group 1) or 0,5% and than 0,25% bupivacaine (Group 2). Anaesthesia was maintained with sevoflurane, which concentration was adjusted to achieve a target state entropy of 40–60 with air 50% in oxygen. Measurements included the inspired (FISEVO) sevoflurane concentrations, blood pressure (BP), and heart rate (HR) before surgery and every 5 min during surgery.

Results: During surgery, both groups were similar for HR and BP, but FISEVO were significantly higher and more variable with bupivacaine 0,125% than with bupivacaine 0,5%. Patients in Group1 received more fentanil throughout the surgical procedure (280,3 ± 48,1 mcg in group 1 vs. 150,8 ± 27,6 mcg in group 2). Co analgesia with intravenous fentanyl was exceptionally seldom needed, except for induction. Patients of group 1 showed significant increase in blood loss and requirements for lactated Ringer solution compared to group 2. I.V. fluid and blood loss represent the values recorded during the whole surgical procedures. Urine output was significantly increased in group 2 compared to patients of group 1. The use of intraoperative vasopressor was higher in the 0,5% bupivacaine group. Hemodynamically significant hypotension had 13 patients in group 1 (43,3%) and 22 patients in group 2 (73,3%). There was a significant difference between groups in the number of patients who had intraoperative least one episode of hemodynamically significant hypotension (p=0,035).

Conclusion: Our results support the routine use of low thoracic epidural analgesia as part of the anaesthesia protocol for patient undergoing abdominal aortic surgery. The use of higher concentration of bupivacaine gave excellent anaesthetic condition during surgery and was superior to 0,125% bupivacaine from all clinical aspect except the need for more ephedrine and phenylephrine which could be precluded by reducing the bolus dose and maintenance rate of the 0,5% solution, and than 0,25% bupivacaine.

Keywords: Combined thoracic epidural/general anesthesia; different concentrations of bupivacaine; sevoflurane; entropy

References

1 Panousis P, Heller AR, Koch T, Litz RJ: Epidural ropivacaine concentrations for intraoperative analgesia during major upper abdominal surgery: a prospective, randomized, double-blinded, placebo-controlled study. *Anesth Analg* 2009; **108**(6): 1971–1976.

2 Zhang JBS, Zhang WMS, Li BMS: The effect of epidural anesthesia with different concentrations of ropivacaine on sevoflurane requirements. *Anesthesia Analgesia* 2007; **104**(4): 984–986.

3 Eid EA, Samarkandi AH, Al Saif F: Combined epidural-general anesthesia in patients undergoing pancreatic surgery: comparison between bupivacaine 0.125% and 0.25%. *Alexandria Journal of Anesthesia and Intensive Care* 2007; **10** (1).

4 Shono A, Sakura S, Saito Y, Doi K, Nakatani T: Comparison of 1% and 2% lidocaine epidural anaesthesia combined with sevoflurane general anaesthesia utilizing a constant bispectral index. *British Journal of Anaesthesia* 2003; **91**(6): 825–829.

5 Hodgson PS, Liu SS, Gras TW. Does epidural anesthesia have general anesthetic effects? A prospective, randomized, double-blind, placebo-controlled trial. *Anesthesiology* 1999; **91**: 1687–1692.

Paper No: 329.00

The perioperative combination of methadone and ketamine significantly decreased postoperative opioid requirements after lumbar arthrodesis

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Introduction: A supra- additive synergy between N?methyl?D-aspartate (NMDA) receptor antagonist ketamine and methadone to produce antinociception in experimental neuropathy has been demonstrated. This combination has not been used in the clinical practice and could result beneficial during the postoperative period of the lumbar arthrodesis.
Objective: We hypothesized that the perioperative administration of combined methadone-ketamine can reduce the postoperative opioid requirements, compared with methadone alone.
Methods: Twenty patients randomly distributed in two groups, received double-blind: intraoperative ketamine bolus (0.5 mg/kg) after tracheal intubation, followed by an infusion of 2.5 ug/kg/min (MK group) or saline serum (ME group). For postoperative analgesia 48h, they used a PCA (patient controlled anaesthesia) that could delivery bolus with a lockout 10 minutes with a maximum 3 boluses/h; the bolus contained in MK group: methadone 0.25mg plus ketamine 0.5mg and in ME group: methadone 0.5mg. Before closing the wound, all patients received iv methadone 0.1 mg/kg, dexketoprophen 50 mg, and paracetamol 1g. Dexketoprophen went on administering every 12 hours and paracetamol every 6 h during the following 48 h. In the recovery room iv methadone was administered until NRS was 4, when PCA was started.
Results: There were no significant differences regarding to demographic data. Remifentanil requirements were significantly higher in MK group (p:0.004). On arrival at recovery room, patients had similar Ramsay values, they suffered severe pain and received the same dose of methadone. Intensity of pain evaluated by NRS (numerical rating scale) at rest and movement, 24 and 48 h after surgery, was similar between the groups. Patients belonging to MK group received around a 70% less methadone by PCA at 24h (MK vs ME group, mean $\pm$SD): 4.18 mg $\pm$ 3.1 vs 14.4 mg $\pm$ 6.5 ($p<0.001$); and at 48h: 2.4 mg $\pm$ 2.3 vs 8.8 mg $\pm$ 5.4 (p: 0.001). Patients in MK group also attempted less doses, at 24h: 39.4 $\pm$ 41 vs 89.3 $\pm$ 54.7 (p:0.042). The delivery / demand ratios were similar between the groups.The incidence of side effects was comparable in both groups.
Conclusion: Perioperative ketamine- methadone combination significantly decreased opioid consumption by PCA. Patients in this group had similar postoperative NRS values than those received methadone alone.

Reference

1 Pelissier T, Laurido C, Kramer V, Hernández A, Paeile C. Antinociceptive interactions of ketamine with morphine or methadone in mononeuropathic rats. *Eur J Pharmacol* 2003; **477**: 23–8

Paper No: 370.00

Postoperative pain management in a teaching hospital in vietnam

Ngan Giang Ta and Huu Tu Nguyen

Introduction: In spite of having much progress, postoperative pain seems to be major challenge[1]. A recent study in Vietnam shown that 88% of patients experienced some pain in the first week after surgery[2]. Acute pain service (APS) has not been set up in almost all surgery centers. In Hanoi Medical University (HMU) hospital, a nurse-based anesthesiologist-supervised APS has been established since 2008. The purpose of this study is to evaluate the efficacy and safety of APS in HMU hospital of the first two years.
Methods: Retrospective review of patients received postoperative pain management from September 2008 to December 2010. Two methods of pain relief were used: Epidural infusion analgesia (EIA): a solution of 0.1% bupivacain with fentanyl 2 μg/ml and adrenalin 1/200000 was infused at 3 – 10ml/h. The infusions were continued up to 4 days. Patient control analgesia (PCA): a solution of morphine 1mg/ml was used. PCA pumps were set to deliver a bolus dose of 1 mg with a lock out time of 10 minutes; the 4-hour maximum dose was 10 to 20 mg. No background infusions were used. PCA was stopped if daily morphine consumption less than 10 mg and VAS in motion less than 4. VAS and side effects were assessed every 6 hours.
Results: A total of 1028 patients were enrolled, among them 824 patients received EIA and 204 received PCA. In EIA group, 396 (48.2%) received thoracic epidural and 425 (51.8%) received lumbar epidural injection. Average infusion rate was 5.2 $\pm$ 1.4 ml/h. Mean VAS measured at rest and in motion were less than 4 at 6h, 24h, 48h, 72h postoperatively. Differences among types of operation were not significant. In PCA group, 156 (76.5%) received paracetamol or NSAID as an adjuvant. Median duration of PCA use was 72 hours (24 to144 hours); median morphine consumption was 36 mg (11 to 155 mg). Patients who did not receive adjuvant analgesic had longer use of PCA pump and more morphine consumption. Mean VAS measured at rest and in motion were less than 4 at 6h, 24h, 48h, 72h postoperatively. Differences among types of operation were not significant. 175 patients (21.3%) in EIA group and 26 (12.7%) in PCA group experienced adverse effects; the commonest was nausea and vomiting. No serious complication was recorded.

Conclusion: The APS has provided as good quality of post-operative pain relief. Low incidence of side effects reflects safety of analgesic modality used.

References

1 JL Apfelbaum, Connie Chen, Shilpa S Mehta, Tong J Gan. Post-operative pain experience: results from national survey suggest postoperative pain continues to be under managed. *Anesthesia Analgesia* (2003); **97**: 534–40

2 Tu Nguyen Huu, Tu Nguyen Thi Ngoc. Evaluating complication during 1 month after surgery. *Journal of Medical Research* (2005), supplement **39** (6): 277–28

Paper No: 372.00

A comparative study of sciatic nerve block for leg and foot surgery in elderly patients with the help of nerve locator vs paraesthesia elicitation technique

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Introduction: King Edward Medical University and Allied Hospitals. Email: asad_naila@yahoo.com Introduction: Peripheral and neuraxial nerve blocks can provide superior pain management, improve patient outcome and decrease the risk of complication in elderly patient. The presence of coexisting disease such as Hypertension, Diabetes, COPD makes them vulnerable to the side effects of General Anaesthesia. The use of a peripheral nerve stimulator (PNS) has been an effective technique for determining adequate needle placement to produce regional anaesthesia.1

Objective: To assess the efficacy and reliability of sciatic nerve block for surgery of each technique in elderly patients. Method. Sixty patients of 60–90 years of age were randomly divided into two groups. In Group I Sciatic nerve was blocked with a nerve locator and in group II paraesthesia elicitation technique was used. 20 ml of 0.5% bupivacaine was administered in both groups. Haemodynamic parameters were recorded before and after the sciatic nerve block. We recorded time of onset of sensory and motor block, degree of sensory, motor block and pain.

Results: Statistically significant difference was seen in sensory block, motor block and degree of pain between groups. ($P<0.05$) The time for onset of block was same in both groups and haemodynamics remained stable before and after the block in both groups.

Discussion: Sciatic nerve block is a useful technique for lower limb surgery in elderly patients of ASA II & III in whom central neuraxial block is avoided. It decreases the risk of cardiovascular complications.2 Our study assessed the efficacy of sciatic nerve block in elderly patients with help of nerve locator versus paresthesia elicitation technique. Significant difference in the quality of anaesthesia was seen in our study ($p<0.05$) between the two techniques. The block with nerve locator elicited dense sensory, moderate motor block and successful surgical anaesthesia and analgesia in all patients. Paresthesia elicitation technique showed moderate sensory and mild motor block in patients. 50% patients complained of pain on bone manipulation and ketamine was given. Haemodynamic stability was seen with both techniques. The results of our study are in accordance with the study conducted by Hanks et al. The duration of sensory and motor block were similar in both studies(7–8 hours)3. Our results are in consistence with Marhofer et al. who used same concentration and volume of bupivacaine as in our study and had a similar onset time (30 min).4

Conclusion: Sciatic nerve block with a nerve locator is a reliable and effective method in comparison to paresthesia elicitation technique.

References

1 Abrahams MS, Aziz MF, Fu RF, Horn JL. Ultrasound guidance compared with electrical neurostimulation for peripheral nerve block: a systematic review and meta-analysis of randomized controlled trials Br J Anaesth 2009; **102**: 408–17.

2 Anthony R, Brown MB, Fuzier R, Tissot B, Mercier-Fuzier V, *et al.* Evaluation of regional anaesthesia procedure in an emergency department. *Ann Fr Anesth Reanim* 2002; **21**: 193–7.

3 Hanks KR, Pietrobon R, Nielson KC, Steele MS, Tucker M, Warner DS, King KP, Klein SM. The effect of age on sciatic nerve block duration. *Anesth Analg* 2006; **102**: 588–92.

4 Marhofer P, Oismuller C, Faryniak B, Sitzwohl C, Mayer N, Kpral S. Three in one blocks with ropivacaine;evaluation of sensory onset time and quality of sensory block. *Anesth Analg* 2000; **90**: 125–8.

Paper No: 375.00

To study the analgesic efficacy and safety profile of paravertebral bupivacaine as compared to intravenous fentanyl for adults undergoing percutaneous nephrolithotomy (PCNL) under general anaesthesia

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Introduction: PCNL involves supracostal or infracostal punctures to enable endoscopic removal of kidney stones after which nephrostomy tubes are inserted leading to considerable perioperative pain1,2. A unilateral paravertebral (PVB) block previously found to provide pain relief for renal surgery in children3,4 but rarely evaluated in adults.,5.

Objective: To ascertain the efficacy of paravertebral bupivacaine for providing perioperative pain relief in adults undergoing PCNL under general anaesthesia. Methods: After ethics approval 50, ASA Grade I, II patients, 18–65years for

PCNL studied in this prospective, randomised, controlled, observer blinded trial. All premedicated with IV midazolam, those randomized to the block group received a PVB block (T9 level) on the operative side, sitting position, with 16G Tuohy needle, 20 ml of 0.5% bupivacaine was administered and 4–5cms catheter was threaded into the space. Patients in both groups were anaesthetized (propofol, fentanyl (2mcg/kg), vecuronium) and turned prone. All received 1 gm paracetamol 6 hourly. A 20% increase in heart rate or mean arterial pressure intra-operatively was treated with 0.5mcg/kg fentanyl boluses. Visual analogue scale (VAS) scores (0–10) on rest and movement were assessed at 0,1,2,4,6,12hrs postoperatively as well as next morning and evening by a blinded observer. Time to first requirement of analgesia (VAS >3) was noted and the PCA pump activated. The PVB group received repeat 20ml bolus of 0.25%bupivacaine in the catheter at this time as well as the next morning. The total fentanyl consumed and PONV was noted.
Results: The demographic and surgical profile of the two groups was comparable. Intraoperative fentanyl requirement was significantly more in control group. Time to first analgesic requirement was significantly longer in the PVB group [120 mins (30–570)] as compared to the control group [30 mins (0–180)]. The VAS on first request for analgesia was higher in the control group (5.25 ± 1.56) as compared to the PVB group (4.36 ± 0.49) ($P=0.0009$). The VAS on rest (at 0,1,2 and 12 hrs) and on movement (at all time points) was significantly lower in the PVB group. Postoperative fentanyl consumption was significantly lesser in this group [175mcg (25–475)] versus the control group [525 mcg (150–1275)]. No difference in PONV or catheter related bladder discomfort seen between the groups. The quality of recovery score was significantly better in the PVB group. No pneumothorax, hypotension observed, blood in catheter in 3 patients cleared after catheter withdrawn, re-sited.
Conclusion: unilateral paravertebral block provides effective pain relief for PCNL and significantly decreases fentanyl requirement.

References

1 Jonnavithula N, Pisapati MV, Durga P, Krishnamurthy V, Chilumu R, Reddy B. Efficacy of peritubal local anesthetic infiltration in alleviating postoperative pain in percutaneous nephrolithotomy. *J Endourol* 2009; **23**: 853–856.

2 Pietrow PK, Auge BK, Lallas CD, Santa-Cruz RW, Newman GE, Albala DM, Preminger GM. Pain after Percutaneous Nephrolithotomy: Impact of Nephrostomy Tube Size. *J Endourol* 2003; **17**: 411–412.

3 Lonnqvist PA, Olsson GL. Paravertebral vs epidural block in children. Effect on postoperative morphine requirement after renal surgery. *Acta Anaesthesiol Scand* 1994; **38**; 346–349.

4 Berta E, Spanhel J, Smakal O, Smolka V, Gabrhelik T, Lonnqvist PA. Single injection paravertebral block for renal surgery in children. *Pediatric Anesthesia* 2008 **18**: 593–97.

5 Akin S, Aribogan A, Turunc T, Aridogan A. Lumbar plexus blockade with ropivacaine for postoperative pain management in elderly patients undergoing urologic surgeries. *Urol Int* 2005; **75**: 345–49.

Paper No: 380.00

Bilateral ultrasound-guided oblique subcostal transversus abdominis plane block provides effective intra- and postoperative analgesia as intravenous morphine in laparoscopic cholecystectomy

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Introduction: The novel ultrasound-guided oblique subcostal transversus abdominis plane (OSTAP) block has been shown to provide a wider sensory block to the anterior abdominal wall than the classical posterior approach. Therefore its use is suitable for surgery both superior and inferior to the umbilicus. Despite the encouraging initial results, there has yet to be any work demonstrating the comparative analgesic efficacy of OSTAP block with standard systemic opioids or epidural analgesia.
Objective: We studied the efficacy of OSTAP block in providing intra- and postoperative analgesia in comparison to conventional intravenous (IV) morphine during laparoscopic cholecystectomy.
Methods: In this prospective, randomised and single-blind study, 34 adult patients undergoing laparoscopic cholecystectomy under standard general anaesthesia received either bilateral OSTAP block using 1.5 mg/kg ropivacaine on each side ($n=17$) or IV morphine 0.1mg/kg ($n=17$). Intraoperative hemodynamic parameters (pulse rate, systolic and diastolic blood pressure and mean arterial blood pressure) were recorded every five minutes. Repetitive boluses of IV fentanyl 0.5 ?g/kg were given as rescue analgesic when any of the above-mentioned parameters rose more than 15% from the baseline values. Intraoperative fentanyl requirements and time to extubation were documented. Additional boluses of IV morphine 0.05mg/kg were administered in recovery room if the recorded visual analogue scale (VAS) score was more than 4. VAS score, nausea and vomiting score, sedation score as well as postoperative morphine requirements were recorded.
Results: The morphine group required more rescue fentanyl in contrast to the OSTAP block group but the difference was not significant statistically [mean (SD) 34.4 (41.04) vs 22.4 (27.73) μg; $p=0.323$]. Time to extubation was significantly shorter in the OSTAP block group [mean (SD) 10.4(2.79) vs 12.5(2.70) min; $p=0.030$]. Both methods delivered an excellent analgesia [median VAS score (IQR) 2(2)] and did not differ in postoperative morphine consumptions. The morphine group demonstrated a higher sedation score [median sedation score (IQR) 1(1) vs 0(1); $p=0.320$] as well as incidence of nausea and vomiting (35.3% vs 11.8%; $p=0.225$). However, these between-group differences failed to show any statistical significance.

There were no complications attributable to the OSTAP block.

Conclusion: Ultrasound-guided OSTAP block is as efficacious as IV morphine in providing effective analgesia during laparoscopic cholecystectomy. Therefore it can be introduced as a component of a multimodal analgesic regimen. The shorter time to extubation in the former method may be an advantage in ambulatory care.

References

1 Tran TM, Ivanusic JJ, Hebbard P, Barrington MJ. Determination of spread of injectate after ultrasound-guided transversus abdominis plane block: a cadaveric study. *Br J Anaesth* 2009; **102**: 123–127.

2 Hebbard P, Barrington MJ, Vasey C. Ultrasound-guided oblique subcostal transversus abdominis plane blockade: description of anatomy and clinical technique. *Reg Anesth Pain Med* 2010; **35**: 436–441.

3 Hebbard P, Fujiwara Y, Shibata Y, Royse C. Ultrasound-guided transversus abdominis plane (TAP) block. *Anesth Intensive Care* 2007; **35**: 616–617.

4 Carney J, McDonnell JG, Ochana A, *et al.* The transversus abdominis plane block provides effective postoperative analgesia in patients undergoing total abdominal hysterectomy. *Anaesth Analg* 2008; **107**: 2056–2060.

5 El-Dawlatly AA, Turkistani A, Kettner SC, *et al.* Ultrasound-guided transversus abdominis plane block: description of a new technique and comparison with conventional systemic analgesia during laparoscopic cholecystectomy. *Br J Anaesth* 2009; **102**: 123–127.

Paper No: 396.00

A study to compare lornoxicam and diclofenac for postoperative pain relief in patients undergoing abdominal hysterectomy

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Introduction: Diclofenac (cox-1 and cox2 inhibitor) is being used conventionally for many years for postoperative pain relief.1 Lornoxicam is a relatively new nonsteroidal anti inflammatory drugs (NSAID) of oxicam group. Besides its inhibitory effects on cox-1 and cox-2 peripheral receptors, it also increases endogenous dynorphin and beta-endorphin levels promoting central analgesic and antiinflammaory effects.2.

Aims & Objectives. The present study was undertaken to compare the analgesic effect of Lornoxicam vis-à-vis diclofenac for postoperative pain relief in patients undergoing abdominal hysterectomy.

Material & Methods: Sixty adult ASA I and II patients undergoing abdominal hysterectomy under general anaesthesia were randomly allocated to one of the two groups. Group- I(n=30) Patients were administered lornoxicam 8mg intramuscular at the time of closure of the wound and was repeated 12 hourly for the next 48 hours. Group-II(n=30) Patients recieved diclofenac 75mg intramuscularly atthe time of wound closure and was repeated 12 hourly for the next 48 hours. Intravenous morphine was used as rescue analgesia in both groups with patient controlled analgesia (PCA) pump.

Results: Requirement of morphine (rescue analgesia) in lornoxicam group was 50.0 ± 4.74 mg while in the diclofenac group, it was 30.2 ± 3.24 mg during the study period (48 hours). Requirement of morphine in first 24 hours in the lornoxicam group was 26.90 ± 3.81mg while in diclofenac group it was 24.10 ± 3.89 mg, the difference was statistically significant ($p<0.01$). Requirement of morphine between 24–48 hours was 23.10 ± 4.99 mg and 6.10 ± 2.99 mg in the lornoxicam and the diclofenac group respectively($p<0.001$). The requirement of morphine at 24 to 36 hours in the lornoxicam group was 11.3 ± 3.40mg while in the diclofenac group, it was 3.60 ± 1.99mg ($p<0.001$) where as at 36 to 48 hours it was 11.80 ± 3.24 mg and 2.50 ± 1.59 mg ($p<0.001$) respectively.

Conclusions: Diclofenac sodium when used in doses of (75 mg 12 hourly) proved to be a better analgesic when compared to lornoxicam (8 mg 12 hourly). In first 6 hours of postoperative period, the requirement of rescue analgesia (morphine) was almost similar in both the groups but with every passing hour, the requirement went on decreasing in the diclofenac group, meaning thereby that diclofenac sodium had more prolonged duration of action which could be because of its metabolites.

References

1 Tripathi KD. Non steroidal anti-inflamatory drugs and antipyretic-analgesics. In: Tripathi KD, editor. *Essentials Of Medical Pharmacology*. 5th ed. Delhi: Jaypee Brothers; 2003. pp167–84

2 Arslan M, Tuncer B, Babacan A, Taneri F, Karadenizli Y, Onuk E, *et al.* Postoperative analgesic effects of lornoxicam after thyroidectomy: a placebo controlled randomized study. *Agri* 2006; **18**(2): 27–33.

Paper No: 411.00

Effect of the menstrual cycle phase on postoperative pain perception and analgesic requirements

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Introduction: Studies performed on pain in women during different phases of menstrual cycle have shown differences in pain sensitivity and analgesia requirements. Most of these studies have used experimental pain stimuli. Research on the effect of menstrual cycle on clinical acute pain is scarce, and is almost non-existent for postoperative pain.

Objective: To determine the effect of the menstrual cycle phase on pain perception and analgesic requirements following total abdominal hysterectomy.
Methods: Approval was obtained from the ethical review committee and informed consent was taken from all participants. Sixty American Society of Anesthesiologists (ASA) physical status I-II females with regular menstrual cycles, undergoing total abdominal hysterectomy were recruited and divided into 'follicular' and 'luteal' groups according to their menstrual history. A standardized anesthesia technique was employed and blood was drawn for estradiol and progesterone levels. Postoperative pain was managed with patient controlled intravenous analgesia using tramadol and rescue analgesia was provided with intravenous morphine. Pain scores were assessed by numeric rating scale in the recovery room and ward up to 24 hours and analgesic consumption was noted by the researcher blinded to the menstrual cycle phase of the patient.
Results: The two groups were similar demographically. Estradiol and progesterone levels correlated with the menstrual cycle phase determined by history. Pain scores on recovery room and ward six and 24 hours postoperatively were similar in the groups at rest and on coughing. Pain scores at rest twelve hours postoperatively were significantly higher in the luteal group ($p=0.043$), while they were similar on coughing at this time point. The tramadol requirement was similar in the two groups. The number of patients requiring rescue analgesia and the amount of morphine used was also similar.
Conclusion: There was no difference in pain scores in the two groups except for rest pain 12 hours postoperatively, which was higher in the luteal group. As pain was assessed at thirteen time points in each patient, a significant difference seen only at one point is likely to be due to random chance, especially as analgesic requirements were also similar in the two groups. We conclude that there is no difference in pain perception and analgesic requirements during the follicular and luteal phases of menstrual cycle following total abdominal hysterectomy. We suggest that future research should concentrate on studying this issue in patients of a younger age group with more pronounced hormonal variations during the cycle.

References

1 Fillingim RB, Maixner W, Girdler SS, Light KC, Harris MB, Sheps DS, Mason GA. Ischemic but not thermal pain sensitivity varies across the menstrual cycle. *Psychosom Med*. 1997; **59**: 512–20.
2 Riley JL, Robinson ME, Wise EA, Price DD. A meta-analytic review of pain perception across the menstrual cycle. *Pain*. 1999; **81**: 225–35.
3 Sener EB, Kocamanoglu S, Cetinkaya MB, Ustun E, Bildik E, Tur A. Effect of menstrual cycle on postoperative analgesic requirements, agitation, incidence of nausea and vomiting after gynecological laparoscopy. *Gynecol Obstet Invest*. 2005; **59**: 49–53.
4 Hanci V, Ayoglu H, Ylmaz M, Yurtlu S, Okyay RD, Erdoðan G, Baþaran M, Turan IO. Effect of menstrual cycle on the injection pain due to propofol. *Eur J Anaesthesiol*. 2010; **27**: 425–27.
5 LeResche L, Mancl LA, Sherman JJ, Gandara B, Dworkin SF. Changes in temporomandibular pain and other symptoms across the menstrual cycle. *Pain*. 2003; **106**: 253–61.
6 Sherman JJ, LeResche L. Does experimental pain response vary across the menstrual cycle? A methodological review. *Am J Physiol Regul Integr Comp Physiol*. 2006; **291**: R245–56.

Paper No: 419.00

Effect of local anaesthetic volume on analgesia efficacy and respiratory consequences of ultrasound-guided interescalene brachial plexus block: report of 12 cases of arthroscopic rotator cuff decompression

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Introduction: Interescalene brachial plexus block (ISBPB) is the best nerve block technique for shoulder surgery. However, it is associated with a 100% incidence of phrenic nerve palsy that limits its application in patients who present a limited pulmonary reserve.
Objectives. To evaluate the incidence of phrenic nerve palsy using a low volume ISBPB (10mL) and the anaesthetic and analgesic efficacy of this block by performing all the procedures without general anaesthesia.
Methods: Twelve patients undergoing shoulder surgery received an ultrasound-guided ISBPB with 10mL of ropivacaine 0,5%. They were sedated with midazolam and propofol during the procedure. Diaphragmatic movement was evaluated by ultrasonography 30 minutes after receiving ISBPB. Motor and sensory block onset and duration of analgesia, VRS for pain, analgesic consumption within the first 24 hours, other side-effects including Horneŕs syndrome, hoarseness, analgesic-related adverse effects and wake-up frequency because of pain during the first night after surgery were additional outcomes. Summary data were calculated using a software and presented as mean (SD).
Results: Phrenic nerve palsy was present in 4 patients (33%). The mean (SD) sensory block onset time was 8.8 (1.8) minutes. Motor block onset time for the biceps was 4.5 (1.4) minutes and for the triceps was 6.4 (3.1) minutes. Mean duration of analgesia was 10.4 (1.6) hours. Pain score (VRS) at 30 min after surgery was 1.2 (2.8), at 60 min was 1.1 (2.1), at 120 min was 0.6 (1.05) and at 24hs was 3.8 (2.3). Total morphine equivalent consumption (mg) within the first 24hs was 2.8 (5.9). Wake-up frequency because of pain was 0.6 (1.3) times. The incidence of phrenic nerve palsy was lower than the one reported in previous studies (33% vs 45%). No general anaesthesia was performed. Pain scores, duration of analgesia and also morphine consumption were similar when compared to the standard technique.

Horner's syndrome was observed in one patient. None of the 12 patients developed post-block complications. There was a slower onset time of sensory and motor block compared to the standard anaesthetic volume ISBPB.

Conclusion: The use of low- volume ultrasound guided plexus block is associated with fewer respiratory complications and no differences in postoperative analgesia compared with the standard technique. The most important difference with previous studies is that no general anesthesia was given, avoiding its risks for this type of procedures. A double blind, randomized controlled trial is being performed in our Department in order to study our findings.

References

1 Urmey WF, Sharrock NE. One hundred percent incidence of hemidiaphragmatic paresis associated with interescalene brachial plexus anesthesia as diagnosed by ultrasonography. *Anesth Analg* 1991; **72**: 498–503.

2 Urmey WF, McDonald M. Hemidiaphragmatic paresis during interescalene brachial plexus block: effects on pulmonary function and chest wall mechanics. *Anesth Analg* 1992; **74**: 352–7.

3 Arborelius M, Lilja B, Senyk J. Regional and total lung function studies in patients with hemidiaphragmatic paralysis. *Respiration* 1975; **32**: 253–264.

4 Gould L, Kaplan S, McElhinnney AJ, Stone DJ. A method for the production of hemidiaphragmatic paralysis. Its application to the study of lung function in normal man. *Am Rev Resp Dis* 1967; **96**: 812–4.

5 Riazy S, Carmichael N, Awad I, Holtby M, McCartney JL. Effect of local anesthetic volume (20 vs 5 ml) on the efficacy and respiratory consequences of ultrasound-guided interescalene brachial plexus block. *British Journal of Anaesthesia* 2008; **101**(4): 549–56.

6 Al Kaisy A, Chan VW, Perlas A. Respiratory effects of low-dose bupivacaine interescalene block. *British Journal of Anaesthesia* 1999; **82**(2): 217–20.

Paper No: 431.00

Stimulating versus non-stimulating catheters for continuous peripheral nerve blocks: a retrospective analysis of 1016 different catheter techniques in major and minor orthopaedic surgery

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Introduction: There is an ongoing debate weather the use of stimulating catheters reduces the failure rate of postoperative analgesia and extent of postprocedural pain.

Objectives. The aim was to compare failure rate and degree of postoperative pain between consecutively inserted stimulating and non-stimulating catheters for continuous peripheral nerve blocks.

Methods: A retrospective analysis of prospectively collected data between January 2009 and August 2010 was performed. The cohort was a mixed case orthopaedic patient population. Data included demographics, catheter type, postoperative visual analogue scale (VAS) during the first 48 hours after operation, failure rate (FR: VAS >3 +/− switch to rescue medication), and the percentage of rescue analgesics (RA).

Results: In 1016 patients (271 male, 745 female), 431 Non-Stimulating Catheters (NSC: 98 male, 333 female) and 585 Stimulating Catheters (SC: 174 male, 411 female) were inserted: 203 interscalene (ISC), 262 femoral (FC), 7 ventral sciatic (VIC), 543 distal sciatic (DIK), and 1 axillary plexus catheter (APC). Surgery included 200 shoulder (95 rotator-cuff repairs, 10 shoulder prostheses, 95 others), 270 knee (175 total knee replacement, 37 anterior cruciate ligament repair, 58 others), 544 foot (380 hallux valgus, 164 others), and 2 elbow operations. 2/1016 patients (0.2%) have permanent nerve damage, both after ISC placement (2/203,1%) for a rotator-cuff repair.

ISC	FC	VIC	DIC	VAS>3	FR	RA
SC 139	159	7	279	144(25%)	23(4%)	20(3%)
NSC 64	103	0	264	130(32%)*	46(12%)* 31(8%)*	
ISC-NSC	ISC-SC	FC-NSC	FC-SC	DIC-NSC	DIC-NSC	
VAS>3	50(36%)*	51(50%)	61(38%) 39(15%)	33(12%)		
FR	24(38%)	12(9%)*	8(8%)	4(3%)	14(5%)	7(3%)
RA	19(30%)	11(8%)*	7(7%)	5(3%)	5(2%)	4(1%)

* $p<0.01$, Fisher's exact test.

Discussion: Overall, a significantly greater percentage of VAS >3, FR and RA was found for NSC. In sub-group analysis, only the stimulating ISC procedure revealed better results. This could be explained by the greater technical challenge of this approach.

Conclusion: In this large cohort, the use of SC revealed significantly better results for ISC but not in the other regions.

References

1 The effect of stimulating versus nonstimulating catheter techniques for continuous regional anesthesia: a semiquantitative systematic review. Morin AM, *et al. Reg Anesth Pain Med*. 2010 Mar-Apr;**35**(2): 194–9.

2 Ultrasonography and stimulating perineural catheters for nerve blocks: a review of the evidence. Tran de QH, *et al. Can J Anaesth*. 2008 Jul;**55**(7): 447–57.

Paper No: 447.00

Postoperative Intrathecal Analgesia for Vaginal Hysterectomy: Comparative Clinical Examination of Two Different Small Doses of Morphium Hydrochloride

Lidija Palashevska, Kiro Curlinov, Rusanka Popovska and Snezana Popovska

Introduction: Several techniques for postoperative analgesia can be used. In this study,we examined analgesia and side effects of intrathecal morphium hydrochloride(MCh) after vaginal hysterectomy in the following two small doses:0,05mg and 0,1mg.
Objectives. To prospectively compare the spinal analgesia with two different small doses of morphium hydrochloride after vaginal hysterectomy. Methods: Fourty patients were randomized to receive either 0,5ml/0, 05mg or 0,5ml/0, 1mg of MCh intrathecaly together with 3,5ml;0,5% isobaric bupivacaine hydrochloride. The duration of postoperative analgesia,the intensity of the initial pain sensation and the frequensy of opoid side effects were recorded for the first 24 hours.
Results: The mean duration of analgesia in the group M 0,05 was 14.3 ± 1.1 hours and was significantly shorter than 19.7 ± 1.7 hours in the M 0.1 group ($p<0.005$). Visual analogue scale (VAS) score for the initial pain intensity in the M 0.05 group was 5 (central value). That in the M 0.1 group was 3 (central value). The difference was not significant ($p<0.05$). There was no respiratory depression in the groups. The difference in the frequency of nausea and vomiting was not significant, but that in the frequency of itching was ($p<0.05$).
Conclusion: Intathecal usage of 0.05mg and 0.1mg of MCh provides long lasting postoperative analgesia. It is a practical method for providing it after vaginal hysterectomy. The efficacy of 0.1 mg of MCh is greater compared to that of 0.05 mg of MCh. These doses of MCh do not cause respiratory depression, but cause nausea, vomiting and itching.

Paper No: 459.00

A Randomized, Double-Blinded, Placebo-Controlled Trial of Periarticular Infiltration of 0.25% Bupivacaine for Postoperative Pain Control after Total Knee Arthroplasty

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Introduction: Postoperative pain after total knee arthroplasty (TKA) is one of the most severe pain and can be difficult to manage. In our institute, we usually used intrathecal morphine together with single shot femoral nerve block (FNB) to promote postoperative pain control. Recent studies suggested that periarticular infiltration with local anesthetics may improve postoperative pain control.
Objectives: The primary objective of this study was to determine weather periarticular infiltration of 0.25% Bupivacaine 20 ml could reduce the amount of morphine consumption for controlling breakthrough pain in 24 hours postoperatively.
Methods: One hundred patients undergoing TKA under spinal anesthesia with 0.5% Bupivacaine and 0.2 mg intrathecal morphine together with 0.25% Bupivacaine 20 ml for FNB were studied in a prospective, randomized, double-blinded, placebo-controlled trial. Patients were randomized allocated to one of two groups: Bupivacaine (B group) or normal saline(S group). Twenty milliliter of the study drug or saline was injection around the periarticular area in the surgical field after closure the joint space. All patients underwent a similar perioperative anesthetic and analgesic procedure. After surgery patients were started with intravenous patient-controlled analgesia with morphine to keep their numerical rating score<3.
Results: Twenty six percent of the patients in B-group did not require any morphine supplement in 24 h after operation which was in higher than S group of 12.24% ($p<0.001$). Mean pain free period was also longer: B group$=25+2$ h, S group$=14.8+1.9$ h ($p<0.001$). The B group required less morphine in 24 hr postoperative period: B group$=5.16+4.65$ mg, S group$=8.67+7.26$ mg ($p=0.005$) and also visual analog score at 6, 12 and 24 hr after operation were lower in B group significantly.
Discussion: The usage of periarticular infiltration of local anesthetics is debated of its effectiveness in control postoperative in orthopedic operation both hip and knee surgery (1–4). In this study periarticular infiltration with 0.25% Bupivacaine improved quality of postoperative pain control after TKA in the patient who had already received intrathecal morphine and single shot FNB. The anterior aspect of knee is the major generated postoperative pain after TKA. So periarticular infiltration of local anesthetics can locally inhibit pain stimulation which could be spared from FNB.
Conclusion: Periarticular infiltration of local anesthetics is easy to perform and increases quality of postoperative pain control after TKA on the top of intrathecal morphine and FNB.

References

1 Hunt KJ, Bourne MH, Mariani EM. Single- injection femoral and sciatic nerve blocks for pain control aftr total knee arthroplasty. *The Journal of arthroplasty* 2009; **24** (4): 533–8.
2 Kerr DK, Kohan L. Local infiltration analgesia: a technique for the control of acute postoperative pain following knee and hip surgery. *Acta orthopaedica* 2008; **79**(20): 174–83.

3 Hanna MN, Murphy JD, Kumar K, Wu CL. Regional techniques and outcome: what is the evidence? *Current opinion in anaesthesiology* 2009; **22**: 1–5.
4 Carli F, Clemente A, Asenjo JF, Kim DJ, Mistraletti G, Gamarasca M, Morabito A, Tanzer M. Analgesia and functional outcome after total knee arthroplasty: periarticular infiltration VS continuous femoral nerve block. *British Journal of Anaesthesia* 2010; **105**(2): 185–95.

Paper No: 461.00

The efficacy of intrathecal morphine with bupivacaine for postoperative analgesia after TUR-B

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Background. In this randomized study, we evaluated two different doses of intrathecal (IT) morphine with bupivacaine for analgesia after transurethral resection of bladder (TUR-B).
Methods: Seventy-five patients were randomly divided into three groups. They were allocated to receive IT morphine (100 ?g) with 12.5 mg 0.5% bupivacaine (Group I), IT morphine (200 ?g) with 12.5 mg 0.5% bupivacaine (Group II), and IT 12.5 mg 0.5% bupivacaine without morphine (Group III). Postoperative pain was evaluated by VAS during 24 h and each patient was given intravenous paracetamol and Dexketoprophen trometamol if pain severity was moderate. The first requests for analgesia, adverse effects (pruritus, postoperative nausea and vomiting, respiratory depression) were recorded.
Results: Groups were comparable with respect to demographic data. VAS scores were significantly lower in Groups I and II than Group III at 1h, 2h, 4h, 6h, 12h ($p<0.05$). The request for analgesia was significantly higher in Group III than the other two groups ($p<0.05$). More patients reported postoperative nausea in Group II than the other two groups ($p<0.05$).
Conclusion: IT morphine (100 ?g and 200 ?g) with 12.5 mg 0.5% provided a significant reduction in postoperative pain scores compared to IT 12.5 mg 0.5% bupivacaine alone. IT morphine 100 ?g provided comparable postoperative pain control with significantly lower side effects than IT morphine 200 ?g after TUR-B.

Paper No: 472.00

Post-operative analgesia for open thoracotomy lung surgery: a national survey of uk cardiothoracic units

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Background and aims. To determine the analgesia practices and factors influencing the choice off Regional Anaesthesia after adult open thoracotomy (lung surgery) within thoracic centres in the UK.
Methods: A questionnaire survey which was reviewed & endorsed by ACTA (Association of Cardiothoracic Anaesthetists) was distributed (web based & postal) to 38 UK thoracic units.
Results: Out of the 38 units, 2 were excluded as primarily paediatric & non-pulmonary surgery centers. The response rate was 92.1% (35/38) - 37 units responded; 2 incomplete responses were excluded. 62.9% (22) of the units routinely used Thoracic Epidural (TEA) - One of these supplemented with PCEA. 31.4% (11) used Paravertebral block (PVB) combined with IV PCA - One of these added an intrapleural catheter 2.9% (1/35) units used PVB+Intrathecal morphine. Another unit used PCA or intrapleural catheter. 74.3% (26/35) units thought their current practice was ideal. 25.7% (9/35) were dissatisfied. 3 of the 22 units using TEA were dissatisfied - 1 of them would have preferred/ TEA with PCEA, a 2nd (would've preferred) PVB+IV PCA & the 3rd TEA+PCEA / PVB+intrathecal 4 of the PVB+IV PCA group said that they would rather use TE+PCEA. The PCA/Intrapleural unit would prefer IV PCA+Intrapleural block or PVB+PCA.
Conclusions: TEA is the predominant choice with reasonable satisfaction. Most of the units were happy with their current practice. A few units had their choice altered by lack of HDU/ITU beds(51.4%), surgical preference, departmental policy, level of monitoring/staff, equipment shortage/problems & cost.

Paper No: 477.00

Does dexmedetomidine with patient-controlled analgesia morphine is better than continuous morphine infusion as a post operative analgesia in off pump coronary artery bypass grafting surgery?- a preliminary study

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Introduction: Dexmedetomidine is a highly selective ?-2 adrenoreceptor agonist that has both sedative and analgesic

effects1. It will reduce intraoperative anaesthetic drug and perioperative opiate requirements if administer during the perioperative period2,3. Continuous Morphine infusion has been routinely used for post operative analgesia in off pump coronary artery bypass grafting surgery (OPCABG) in Cardiothoracic Intensive Care Unit (CICU), Sarawak General Hospital. Optimal postoperative analgesia ensures a more stable hemodynamic profile, reduced extubation time and stay in intensive care unit. However, excessive opioids can increase adverse effects, which contribute to delayed postoperative recovery4. We propose Dexmedetomidine with Patient-Controlled Analgesia (PCA) Morphine as a post operative analgesia for OPCABG.

Objectives. The goal of this study was to compare the effects of Dexmedetomidine with PCA Morphine and continuous Morphine infusion in sedation score, pain score, hemodynamic variables, extubation time and amount of morphine used.

Methods: A prospective, randomized, double blind study. Thirty patients undergoing OPCABG were allocated to receive either Dexmedetomidine infusion at 0.4 ?g•kg−1•hr−1 with PCA Morphine 1mg per demand with 5 minute lockout interval without basal infusion (n=14) or continuous Morphine infusion at 20 ?g•kg−1•hr−1 (n=16) before sternum closure. All patients received standardized anaesthesia and hemodynamic monitoring. We determined heart rate, mean arterial pressure, central venous pressure, oxygen saturation, pain score (Visual analogue scale), sedation score (revised Riker), extubation time and morphine requirement at 0 hour when patients arrived in CICU, then 1 h, 2 h, 3 h, 6 h, 8 h, 12 h, 18 h and 24 h. IV Morphine 0.05mg/kg is given if pain score is more than 4 in both groups.

Results: Groups were similar for patient demographics, number of grafts, inotropes and vasodilator used. No significant differences were noted between groups for sedation and pain score, heart rate, central venous pressure, oxygen saturation, mean arterial pressure, extubation time and adverse events. Morphine requirements were significantly lower in group Dexmedetomidine with PCA Morphine than group continuous Morphine infusion (19.7 ± 12.4 mg vs. 39.2 ± 16.3 mg, $P<.001$).

Conclusions: Dexmedetomidine with PCA Morphine resulted in lower morphine requirements for post operative OPCABG, however it is not superior in hemodynamic, sedation, pain score and extubation time when compare to continuous morphine infusion.

References

1 Arain SR, Ruehlow RM, Uhrich TD, Ebert TJ, The efficacy of dexmedetomidine versus morphine for postoperative analgesia after major inpatient surgery. *Anesth Analg* 2004; **98**(1): 153–8.

2 Barletta JF, Miedema SL, Wiseman D, Heiser JC, McAllen KJ. Impact of dexmedetomidine on analgesic requirements in patients after cardiac surgery in a fast-track recovery room setting. *Pharmacotherapy*. 2009; **29**(12): 1427–32.

3 Herr DL, Sum-Ping STJ, England M. ICU sedation after coronary artery bypass graft surgery: dexmedetomidine-based versus propofol-based sedation regimens. *Journal of Cardiothoracic and Vascular Anesthesia*. 2003; **17**(5): 576–584.

4 Roediger L, Larbuisson R, Lamy M. New approaches and old controversies to postoperative pain control following cardiac surgery. *European Journal of Anaesthesiology* 2006; **23**: 539–550.

Paper No: 488.00

Long-term Effect Of Slow Release Lidocaine Sheet And Particles In A Rat Model Of Postoperative Pain

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Introduction: Continuous infusion of local anesthetic is widely used for postoperative pain management, however, indwelling catheter is possible to cause tissue injury or infection. Single injection of ultra-long acting local anesthetics can avoid those complications.

Objective: We produced slow release lidocaine sheet and particles with biodegradable polymers, and examined their effects in a rat model of postoperative pain.

Methods: We made novel slow releasing lidocaine sheet (SRLS) and particle (SRLP) with bioabsorbable polymer (polylactic-co-glycolic acid: PLGA or polylactic acid: PLA). We made a hind paw incision using male Sprague-Dawley rats (postoperative pain model), and SRLS, lidocaine itself, or PLGA only (control) was applied near the ipsilateral sciatic nerve just before the paw incision. SRLP or lidocaine solution was injected into epidural space before the paw incision. The development of mechanical hypersensitivity was assessed using von Frey filaments. Their motor paralysis and pathological changes of tissues near the drug administration site were assessed. We also examined c-fos expression in the spinal dorsal horn of segments L4–5 in each sciatic nerve block group.

Results: We could prepare a SRLS (30%, w/w), which continuously release lidocaine for 7 days. In the behavioral studies, the SRLS (20mg: lidocaine 6mg) produced anti-hypersensitivity effect for 7 days. The numbers of c-fos positive neurons in the SRLS-treated group were smaller than that of control group at 2 h, 5 h, 48 h after paw incision. The paralysis score and serum lidocaine concentration were lower than control group. Pathological examination revealed that SRLS induced no change in nerves or muscles. We prepared SRLP that contained 10% lidocaine (w/w), which continuously release lidocaine for 7 days in vitro. Epidural injection of SRLP (80mg: lidociane 8mg) produced anti-hypersensitivity effect for 3 days and more after paw incision without motor paralysis. The spinal cords and peripheral nerves close to the SRLP did not have pathological changes at 1 and 4 weeks after epidural injection.

Conclusions. Single treatment with this SRLS inhibited postoperative nociceptive behavior and c-fos expression in the

spinal cord dorsal horn for a week. Single injection of SRLP also produced anti-hypersensitivity effect for 3 days. Slow releasing technique of local anesthetics might be a promising method for management of postoperative pain.

Paper No: 499.00

Audit of consent for central neuraxial blocks

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Introduction: The AAGBI has published recommendations regarding consent for anaesthesia1. These recommendations include:

- Providing patients with adequate information about anaesthesia preferably in the form of a patient information booklet.
- Ensuring patients have the capacity to understand and make a balanced decision without coercion.
- Documenting the details of the discussion in the patient's record, noting benefits and risks explained.

Objectives:

- To determine what proportion of patients received patient information booklets regarding central neuraxial blocks prior to anaesthesia.
- To determine what proportion of patients had risks of central neuraxial blocks explained and documented.
- To determine what risks were explained.
- To determine patients satisfaction with the information provided.

Methods: We conducted a retrospective audit at a University Hospital over a 3 month period in which we collected data from patients case notes, anaesthetic charts as well as patient interviews. Patients were asked if they received a patient information booklet about central neuroaxial blocks, what risks were explained, incidence of risks quoted and what risks they remembered. Evidence of documentation and patient satisfaction with the information provided were also noted.

Results: There were a total of 57 patients in this audit with a mean age of 67 years having mainly orthopaedic surgery (Fig 1). Most patients were preassessed by a consultant anaesthetist (Fig 2). 21% of patients received a patient information booklet prior to their anaesthetic. Risks were explained to 82% of patients by the anaesthetist during the preoperative visit and the most common risks recorded were Post Dural Puncture Headache (PDPH) and nerve damage (Figure 3). The incidence of complications recorded varied among anaesthetists. Evidence of documentation was noted in 74% of the case notes (Fig 4). More than 50% of patients did not remember any risk explained in the preoperative visit. The most common complications recalled by patients were PDPH and nerve damage followed by infection and failure. The majority (95%) of patients was satisfied with the information provided and would choose this type of anaesthetic again if required.

Conclusions: Consent for Anaesthesia states that patients should have adequate information about anaesthesia to make an informed decision 1, 2, 3. This audit revealed that only 21 % of patients received a patient information booklet prior to admission. However upon further questioning, the majority of patients (68%) did not think a patient information booklet would be useful because the information provided by the anaesthetist during the preoperative visit was more than adequate. Central neuraxial risks were explained to 82% of these patients but only documented in 74% of cases.This audit highlighted failure to achieve 100 % target of explanation and documentation of risks associated with central neuraxial blocks. Recommendations from this audit include increasing awareness and education amongst anaesthetists and modification of the anaesthetic record to include tick boxes as a means of facilitating easier documentation.

References

1 Association of Anaesthetists of Great Britain and Ireland. Consent for Anaesthesia. (2006)

2 Australia and New Zealand College of Anaesthetists: Guidelines on consent for anaesthesia and sedation. (2005)

3 Royal College of anaesthetists-Best practice in the management of epidural analegesia in the hospital setting. (2010)

4 General Medical Council. Consent Guidance: patients and doctors making decisions together. (2008).

Paper No: 550.00

Anesthetic management of a patient with mitochondrial myopathy undergoing hip fracture surgical repair

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Introduction: Mitochondrial disorders are a rare group of diseases that manifest themselves with defects in electron chain transport or oxidative phosphorylation. They configure a heterogeneous group with an estimated incidence of 1 in 4000 and a wide range of symptoms with an onset varying from birth to adulthood. Clinical manifestations are extremely varied. Most of the symptoms present in tissues with a high metabolic demand, existing a large overlap and no clear correlation between clinical findings and the site of biochemical defect. Considering this scenario, patients with mitochondrial disease represent a challenge for the anesthesiologist since there are not strong recommendations for anesthesia techniques supported by evidence-based medicine.

Objectives. To describe the anesthetic care provided to a patient presenting an unusual condition undergoing an everyday orthopedic surgery at an institution not used to deal with this kind of patients.
Methods: A 74 years old female diagnosed with mitochondrial myopathy (unknown subtype) 50 years ago, was scheduled for elective right hip fracture surgery (dynamic hip screw). At physical examination patient presented moderate muscle weakness, bilateral palpebral ptosis, external opthalmoplegia, dysphagia, visual acuity diminution, impaired hearing and mucous dryness. Laboratory reports were within normal range. She presented no family history of muscle diseases. Prior to surgery, a psoas compartment block (Winnie's approach) was performed using electrical stimulation (40 ml 0.25 % bupivacaine with epinephrine). Surgical anesthesia was completed with a single-shot subarachnoid block (bupivacaine 12 mg and fentanil 25 mcg) and light conscious sedation.
Results: Surgery duration was 150 minutes. Additional anesthetic supplements were not required. The patient went through an uneventful and pain-free postoperative period on intravenous diclofenac infusion as analgesic plan.
Conclusion: Even facing daily procedures, the anesthetic approach for a patient with unusual pathologies must be carefully considered. Since there is not enough evidence, mitochondrial diseases imply having some special considerations from the whole surgical team and although their physiopathology is no longer a mystery, specific anesthesia techniques for these patients remain controversial. Nevertheless, when a case is carefully planned and all different options are considered, a safe and effective, "patient tailor" anesthetic approach can be achieved even with limited resources.

References

1 Muravchick S, Levy RJ. Clinical implications of mitochondrial dysfunction. *Anesthesiology* 2006; **105**: 819–837.
2 Shipton EA, Prosser DO. Mitochondrial myopathies and anaesthesia. *Eur J Anaesthesiol* 2004; **21**: 173–178.
3 Driessen JJ. Neuromuscular and mitochondrial disorders: what is relevant to the anaesthesiologist? *Curr Opin Anaesthesiol* 2008; **21**: 350–355

Paper No: 557.00

Does needle tip position influence intraocular pressure changes associated with ophthalmic regional anesthesia?

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Introduction: Deposition of local anaesthetics within the orbit vary based upon needle angulation and depth. These two variables distinguish intraconal retrobulbar anesthetic blocks from extraconal peribulbar anaesthesia and may have different effects on intraocular pressure(IOP).
Objectives. We measured variation in intraocular pressure generated by two different approaches to ophthalmic regional anaesthesia using an ex-vivo laboratory cohort companion model.
Methods: Piezoelectric microsensors were implanted into the vitreous of ex-vivo cynomolgus monkeys in order to assess continous real time intraocular pressure while controlling for injection pressure and flow of injectant. Two differing anaesthetic technique approaches were measured- deep needle placement with angulation toward the apex of the orbit vs. shallow placement of a needle angled parallel to the globe.
Results: Intraconal retrobulbar injection at a fixed rate of 0.015 cc/sec produced significant increases in IOP over the course of the injection (dP/dT approximating 0.32 mm Hg per second). Extraconal peribulbar needle positioning produced significantly lower changes in IOP (approximating 0.06 mm Hg per second).
Conclusions: Preliminary results indicate that extraconal peribulbar anesthesia increases IOP at a slower rate than intraconal retrobulbar injection.

Paper No: 561.00

Ultrasound Guided Popliteal Block Proximal to Nerve Bifurcation: Single versus Double Sequential Injections A Prospective Randomized Single Blind Study

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Background and aims. Popliteal block is effective in providing adequate anesthesia for foot and ankle surgeries 1; however, delayed onset is the main shortcoming2. Therefore, we hypothesized that double sequential injections proximal to sciatic nerve bifurcation could shorten onset time via increasing exposed surface area of the nerve to local anesthetic (LA).
Methods: Fifty patients scheduled for elective foot or ankle surgery were randomized into two groups; Group(S), received ultrasound (US) guided popliteal block via single injection (30 ml), located 3cm proximal to nerve bifurcation. Group (D), received double injections (15 ml each), the 1st injection was located 3cm proximal to nerve bifurcation while the 2nd injection was proximal to the 1st one and located 3 cm proximal to the point at which no more LA

spread from 1st injection could be traced. All blocks were done using equal volumes of 2% lidocaine and 0.5% Levobupivacaine with 1:200,000 epinephrine. The progress of sensory and motor block in both tibial and common peroneal nerve territories was assessed every 5 mins by a blinded observer. Other measurements included LA spread distance, performance time, procedure related discomfort and patient satisfaction.

Results: Group (D) presented with 37% faster sensory block (15.2+4 vs 23.6+4.7 mins, P<0.0001), 29% faster motor block (19.2 +4.7 vs 26.8 +4.8 mins, P<0.0001), 40% longer exposed nerve length (8.6+1.3 vs 5.16+1.2 cm, P<0.0001), and longer procedure time (5.5+1.1 vs 3.7+ 1 mins, P<0.0001). The distance between the two injections in group (D) was (5.8+1cm). Both groups showed complete block success with comparable procedure-related discomfort and patient satisfaction.

Conclusions: US guided double sequential injections proximal to sciatic nerve bifurcation fastened block onset with correlated increase in exposed surface area to LA.

References

1 White PF, *et al. Anesth Analg.* 2003; **97**: 1303–1309.
2 Taboada M, *et al. Anesth Analg* 2004; **98**: 242–7.

Paper No: 594.00

Effect of local anesthetic infiltration with bupivacaine and ropivacaine on wound healing: a placebo-controlled study

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Background. Local bupivacaine and ropivacaine anesthetic infiltration in surgical wounds are used to reduce the postoperative incisional pain. However, controversy exists regarding the potential deleterious effects of these local anesthetics on wound healing and traction skin resistance.

Methods: Seventy two male Wistar rats were allocated into nine groups of eight animals each. After intraperitoneal anesthesia with ketamine and xylazine, the subcutaneous interscapular dorsal region of the animals were infiltrated with saline 0.9% (S), Bupivacaine 0.5% (B) or Ropivacaine (R). An incision was done in the infiltrated region followed by suture. The animals were killed on the third (3) or fourth (14) day after the operations.

Results: All the day 3 post surgery groups were compared to S3 group. In bupivacaine-treated group (B3) was observed an increase in macrophage number (63%, p<0.05), transforming growth factor beta 1 expression (TGF?1) (115%, p<0.001) and collagen concentration (56%, p <0.01). The expression of endothelial cells markers showed by Cluster of Differentiation 34 expression (CD34) was reduced in B3 group (50%, p <0.05). In ropivacaine group (R3) an increase in TGF?1 expression (63%, p <0.01) was observed. On the day 14 post surgery no changes were observed in all groups compared to S14. The ultimate load, deformation, stiffness and maximum tension, evaluated by mechanical test (mt), ciclooxigenase-2 expression (COX-2) and elastic fibers concentrations were not changed by ropivacaine or bupivacaine application.

Conclusions: Our results suggest that ropivacaine and bupivacaine are safe to clinical use and do not impair the tissue resistance and the wound healing process.

References

1 Kehlet H, Liu SS: Continuous local anesthetic wound infusion to improve postoperative outcome: back to the periphery? *Anesthesiology* 2007; **107**: 369–71
2 Grishko V, Xu M, Wilson G, Pearsall AWt: Apoptosis and mitochondrial dysfunction in human chondrocytes following exposure to lidocaine, bupivacaine, and ropivacaine. *The Journal of bone and joint surgery.* American volume 2010; **92**: 609–18
3 Ozturk E, Yilmazlar A, Berhuni S, Yilmazlar T: The effectiveness of local anesthetics in preventing postoperative adhesions in rat models. *Techniques in coloproctology* 2010; **14**: 337–40
4 Fitzpatrick CL, Weir HL, Monnet E: Effects of infiltration of the incision site with bupivacaine on postoperative pain and incisional healing in dogs undergoing ovariohysterectomy. *Journal of the American Veterinary Medical Association* 2010; **237**: 395–401

Paper No: 600.00

Postoperative pain and pge2 after preemptive analgesia with dexketoprofen. A randomized double blind placebo controlled study

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Introduction: Currently there are different opinions relative to efficiency of preemptive analgesia for postoperative analgesia. Objectives of this study was to investigate the efficiency and safety of dexketoprofen (NSAID) administered 24 hours before surgery.

Methods: in randomized double blind placebo controlled study 42 patients were inrolled. All patients were scheduled for transurethral resection due to cancer and spinal anesthesia was performed in all cases. Patient randomly were

allocated in two groups: Group Dx, where Dexketoprofen 50 mg was given to the patients (n=21) twice a day 24 hours before surgery and in Group Pl, group patients (n=21) received placebo at the same time. Cerebrospinal fluid (CSF) and serum plasma were collected just before incision and serum plasma was collected repeated in 24 hours after surgery. The PGE2 concentrations were measured in serum plasma and CSF. Postoperative pain was estimated with VAS. Serum glucose levels and intraoperative bleeding were controlled during perioperative period.

Results: The patients in Gr.Dx had less level of postoperative pain during first 48 hours after surgery in comparison with patients Gr.Pl, which got placebo (p=0,001). Serum PGE2 in Gr. Dx before surgery was 499,7 ± 383,8 pg/ml (95%CI 303,5–522,4) and in Gr.Pl 1274,8 ± 1071,3 pg/ml (95%CI 703,9–1845,7), p=0,0012. Serum PGE2 24 hours after surgery in Gr.Dx was 339,7 ± 279,6 pg/ml (95%CI 221,1-380,5), p=0,014 in comparison with preoperative level. In Gr.Pl in 24 hours the serum PGE2 was 1020,3 ± 359,4 pg/ml (95%CI 828,7–1211,8), p=0,876 in comparison with preoperative level. Serum PGE2 in 24 hours was significantly lower in Gr.Dx, p=0,00001. PGE2 in CSF in Gr.Dx was also lower: 262,4 ± 276,6 pg/ml (95%CI 218,7–376,6) in comparison with Gr.Pl 645,3 ± 294,4 pg/ml (95%CI 217,5–455,7), p=0,0004. There were no any clinically significant differences in serum glucose and bleeding events during surgery between groups.

Conclusion: The administration of dexketoprofen in dose 50 mg bid 24 hours before surgery were associated with significantly reduction of serum and CSF levels of PGE2 and reduction of pain in postoperative period without increasing the bleeding during surgery.

Paper No: 606.00

Inhibition by ropivacaine of src-kinase activation, intracellular adhesion molecule-1 phosphorylation and production of monocyte chemoattractant protein-1 in h838 lung cancer cells

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Introduction: Recent clinical observations indicate that regional anesthesia may favorably affect cancer outcome (1). However, scarce literature is available elucidating the role of local anesthetics at a molecular level. It is well known that local anesthetics have anti-inflammatory effects. Endothelial barrier dysfunction is a sine quo condition for the process of metastasis, as is vascular hyper-permeability in Acute Lung Injury (ALI). ALI due to inflammatory hyperpermeability is mediated in part by increased ICAM-1 (Intracellular Adhesion Molecule-1) expression, and this was shown to be decreased by ropivacaine (2). Scientific evidence implicates ICAM-1 in tumor invasion in vitro and in metastasis in vivo, and hence in the malignant potential of various types of cancer. Circulating cancer cells extravasate to secondary sites probably using a process similar to inflammatory cells (3). Another potent regulator of endothelial permeability is Src-kinase (Src)(4). We have demonstrated in previous experiments that ropivacaine protects against capillary leakage by suppressing Src activation. Src family protein tyrosine kinases also play a critical role in a variety of cellular signal transduction pathways regulating diverse tumorigenic processes such as cell division, motility, angiogenesis (5) and metastasis (6). Monocyte Chemoattractant Protein-1 (MCP-1) attracts monocytes and macrophages to sites of inflammation (7) and its production is associated with angiogenesis and tumor invasion (8).

Objectives. The goal of this study was to demonstrate whether Ropivacaine attenuates Src activation, ICAM-1 phosphorylation, and MCP-1 production in H838 human lung cancer cells.

Methods: We evaluated the effect of ropivacaine on activation of Src and phosphorylation of ICAM-1, induced by stimulation with lipopolysaccharide (LPS) or compared to untreated cells in H838 non-small cell lung cancer (NSCLC). The influence of ropivacaine on TNFá-induced production of MCP-1 in NSCLC cells was assessed as well. Statistical analysis was made with bivariate correlation analysis (Spearman-Rho).

Results: Ropivacaine dose-dependently decreased Src activation (r-value -0.659, p=0.027) and ICAM-1 phosphorylation (r-value -0.631, p=0.005) induced by 4 hour LPS treatment. Ropivacaine alone also attenuated Src activity (r-value -0.506, p=0.032) and ICAM-1 phosphorylation (r-value -0.65, p=0.003) in the absence of an inflammatory stimulus compared to untreated cells. Furthermore, ropivacaine together added with 20 ng/ml TNFá to H838 cells significantly decreased MCP-1 production at 4 hours (r-value -0.646, p=0.007).

Conclusion: Inhibition of Src activity, ICAM-1-phosphorylation, MCP-1- production, growth and migration of H838 lung adenocarcinoma cells by ropivacaine provide a molecular mechanism by which local anesthetics could exhibit a beneficial effect in cancer progression and metastasis.

References

1 Wuelthrich PY, *et al. Anesthesiology* 2010,**113** (3) 570
2 Blumenthal S, *et al. Anesthesiology* 2006, **104**, 961
3 Rosette C, *et al. Carcinogenesis* 2005, **26**, 943
4 Hu G, *et al. Microvacsc Res* 2009 :**77**, 21
5 Summy JM, *et al. Cancer and Metastasis Reviews* 2003, **22** : 337
6 Guarino M; *J Cell Physiol* 2010, **223**: 14
7 Deshmane SL, *et al. J Interferon Cytokine Res* 2009, **29**: 313
8 Valcovic T, *et al. Virchows Arch* 2002, 440

Paper No: 607.00

Does Ketamine lower postoperative morphine consumption in obese patients after laparoscopic bariatric surgery?

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Introduction: Treatment of pain in obese patients is always a challenge. They have low pain trigger and opioids can be especially harmful because of PONV and respiratory depression. Although laparoscopic surgery less invasive, it can produce moderate to severe postoperative pain. Probably intraoperative nervous fiber section and high temperatures of electrical scalpels contribute to generate pain. So as part of a multimodal analgesia, an antihyperalgesic drug, like ketamine can be helpful for optimizing analgesia. Ketamine is a noncompetitive antagonist of the glutamate NMDA receptors that modulates calcium influx at nerve terminals and thereby interferes in the cascade of biochemical events, including G-protein activation and c-Fos transcription. The NMDA inhibition results in lowering the central sensitization phenomena and synaptic plasticity.
Objective: To evaluate if a single dose of ketamine is effective in lowering morphine consumption during the first 24 hours after a bariatric surgery.
Methods: With a prospective, randomized blind design obese patients undergoing laparoscopic sleeve gastrectomy were divided into two groups. Group K received 0.7 mg/kg (real weight) of ketamine during the induction of anesthesia and the control group (group S) received placebo. To all patients an intraoperative dose of morphine, 0,1 mg kg -1, dexametasone 8 mg and a bolus of ketoprofen 100 mgs were administered and a postoperative ketoprofen infusion of 300 mg afterwards. Endovenose morphine was indicated as rescue analgesia. The total amount of morphine consumed during the first 24 hours was studied. The assessment of postoperative pain was done using the visual analog pain score (VAS) of 11 points (with 0=no pain and 10=the maximum imaginable pain for the patient) at 1, 6, 12, 24 postoperative hours.
Results: 99 adults were studied. 48 patients in group ketamine (K) and 51 patients in control group (S). The demographic characteristics were similar and there were no differences in the duration of surgery (50 ± 11 min). The morphine consumption in the ketamine group was of 9.6 ± 2.1 mgs, whereas in the control group it was of 15.2 ± 3.35 mgs ($p<0.001$). Despite VAS were lower in K group, they were not statistically different. PONV and antiemetics consumption were 31% lower in the ketamine group. No side effects like hallucinations or nightmares were detected in both groups.
Conclusions: Efficacy of ketamine was demonstrated. This decrease in the morphine consumption guarantees a safe analgesia with a low incidence of adverse effects.

References

1 De Kock M, Lavand'homme P. The clinical role of NMDA receptor antagonists for the treatment of postoperative pain. *Best Pract&Research Cl Anaesth* 2007; **21**: 85–98.
2 Wilder-Smith, Arendt-Nielsen L. Postoperative Hyperalgesia. Its clinical importance and relevance. *Anesthesiology* 2006; **104**. 601–607.
3 Petrenko AB, Yamakura T, Baba H. The role of NMDA receptors in pain: a review. Anesthesia and Analgesia 2003; **97**: 1108–1116.

Paper No: 623.00

Modulation of remifentanil-induced hyperalgesia by sevoflurane or propofol anesthesia

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Introduction: Opioids have been used to alleviate moderate to severe pain, but paradoxically induce hyperalgesia possibly via NMDA receptor. Opioid-induced hyperalgesia (OIH) has been reported in surgical patients with high-dose infusion of remifentanil. General anesthetics concomitantly used might affect the OIH, since volatile anesthetics and propofol are known to modulate NMDA receptors.
Objectives. In a randomized, prospective study, we investigated the effect of general anesthetics on remifentanil-induced hyperalgesia in patients under sevoflurane or propofol anesthesia.
Methods: In forty-one patients undergoing thyroidectomy, remifentanil was intraoperatively infused at 0.2 μg/kg/min under sevoflurane or propofol anesthesia titrated to maintain Bispectral Index values at about 50. Tactile pain thresholds on the forearm and periincisional area were assessed by electronic von Frey anesthesiometer the evening before surgery and postoperatively at 24 and 48 h. The goal of pain management during postoperative 48 hrs was to maintain a numerical rating scale (NRS, 0–10)<4. Additional analgesics were recorded in the postanesthesia care unit at postoperative 6, 24 and 48 h.
Results: Tactile pain threshold on the forearm and periincisional area was significantly lower at postoperative 24 and 48 h in propofol group than in sevoflurane group (Table1). In propofol group, pain threshold was decreased on the forearm and periincisional area at postoperative 24 and 48 h. However, in sevoflurane group, pain threshold did not change postoperatively, except on the forearm at

Table 1. Tactile pain threshold measured by electronic von Frey anesthesiometer

	Sevoflurane group	Propofol group	P value
forearm Preop.	120 ± 27	111 ± 35	0.393
POD	1 92 ± 29	68 ± 25	0.008
POD	2105 ± 29	70 ± 29	<0.001
Peri-incisional area Preop.	111 ± 30	100 ± 45	0.325
POD	199 ± 47	53 ± 34	0.001
POD	2100 ± 32	62 ± 39	0.002

postoperative 24 h. The number of patients who requested rescue analgesics did not differ between the groups during postoperative 48 hrs.

Conclusions: Sevoflurane anesthesia attenuates remifentanil-induced hyperalgesia on the forearm and peri-incisional area, compared to propofol anesthesia. However, hyperalgesia did not show clinical relevance in terms of postoperative pain or analgesic consumptions in patients undergoing thyroidectomy.

Paper No: 646.00

Management of the antiaggregated patient in the scheduled non-cardiovascular surgery: Our experience

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Background and goal of the study. It is widely recognised and documented the benefit of antiaggregant drugs in the treatment of cardiovascular and neurological disesases and its potential risk while performing a locorregional anesthesia. There are several protocols about substitutive drugs to maintain a low antiaggregant effect for a minimum space of time that allows to carry out safely a locorregional technique for any kind of surgery.

Material and Methods: We have studied 89 patients with an informed consent granted, previously antiaggregated (clopidogrel and /or Aspirin), scheduled for non-cardiovascular surgery, under a protocol for substitutive antiaggregant drugs with dexibuprofen 400 mg/12h. Each patient was crosstab classified under 9 different categories according to the risk of hemorrhagic event (high, intermediate, low) and thrombotic risk according to its previous condition (high, intermediate, low). Antiaggregant replacement was established between 7 to 2 days. We made three consecutive measurements of the platelet function tests (PFA epinefrin and PFA ADP times): firstly at the time of preoperatory study, when it was scheduled for surgery and instructed for replacement of antiaggregant drugs; secondly 24 hours prior to surgery and thirdly, just before the time of surgery. An account of events was registered and eventually evaluation of events was recorded on the day of the discharge and one month later.

Results: In our study, dexibuprofen provides a safe management of the antiaggregated patients in scheduled non-cardiovascular surgery, while allowing, for its shorter antiaggregant effect, reliability and tolerance, the performance of a local or regional anesthesia. There were not any major cardiovascular or neurological events in any case, after one month of surgery. Only a minor case of local hemorrhage (ophthalmologic surgery, peribulbar technique) .Antiaggregant effect of the substitutive drugs was adequate to maintain it as close as possible to get a narrow window of time for the anesthetic technique and surgery. Tolerance to the drug was good enough and no side or secondary effects were registered. Antiaggregation with the previous treatment was resumed as soon as oral intake was indicated and tolerated.

References

1 Llau Pitarch J, *et al.* (Grupo de redacción de la Sección Hemostasia, Medicina Transfusional y Fluidoterapia perioperatoria dela SEDAR). Guía clínica de fármacos inhibidores de la hemostasia y anestesia regional neuroaxial. *Rev Esp Anestesiol Reanim* 2005; **52**: 413–420.

2 Gonzalez Correa JA, Monsalud Arrebola M, Martin Salido E, *et al.* Effects of dexibuprofen on platelet funcion in humans. Comparison with low-dose aspirin. *Anesthesiology* 2007; **106**: 218–25.

Paper No: 671.00

Evaluation of adverse effects in intrathecal fentanyl

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Introduction: Subarachnoid block is widely used in surgery due to the rapid induction, the complete analgesia, the low failure rate and the prevention of aspiration pneumonia. The addition of intrathecal opioids to local anesthetics seems to improve the quality of analgesia and prolong its duration.

Objective: To compare the onset of adverse effects of fentanyl 20 μg and 40 μg when added to intrathecal hyperbaric bupivacaine 0.5% 12.5mg.

Material and Methods: Prospective randomized clinical trial with two different doses. Patients (n=70): ASA I and II, aged 21–65 years, both sexes, submitted to programmed surgery from June to August 2009, with subaracnoid

anesthesia (SA) as the only technique. SA was administered with 0.5% 12.5mg hyperbaric bupivacaíne plus 20 μg fentanyl (GF20:n=35) or 40 μg fentanyl (GF40:n=35). After surgery the onset of adverse effects (AEs) was controlled, namely, urinary retention (UR), nausea and vomiting (NV), pruritus (PR) and respiratory depression at 8 and 24h by a blind observer. Statistics: Quantitative variables expressed as mean ± SD using Student's t Test for unpaired data comparisons. Categorical variables were expressed as frequency and percentage, using for comparison of proportions Fisher's Exact Test. Significance was admitted if $p<0.05$.

Results: Sex: same frequency for both groups, Female(%): 18(51.4). Group total age: GF20:37 ± 11.6 yr, GF40:34.7 ± 9.6 yr, n.s. Age stratified by sex Female/Male: GF20:35.9/38.2 yr, n.s; GF40:35.3/34.1 yr, n.s. AEs evaluation at 8h: UR: GF20:0/35, GF40:4/35, n.s; NV: GF20:0/35, GF40:1/35, n.s; PR: GF20:2/35, GF40:6/35, n.s. Each sex stratified: UR: Female: GF20:0/18, GF40:2/18, n.s, Male: GF20:0/17, GF40:2/17, n.s; NV: Female: GF20:0/18, GF40:1/18, n.s, Male: GF20:0/17, GF40:0/17, n.s; PR: Female: GF20:2/18, GF40:5/18, n.s, Male: GF20:0/17, GF40:1/17, n.s. No AEs were detected at 24h evaluation. No respiratory depression was present in any patient.

Conclusions: The occurrence AEs in patients that received intrathecal hyperbaric 0.5% bupivacaíne 12.5mg is not dose dependent regarding groups under study GF20 or GF40 ug.

Keywords: Fentanyl; subarachnoid anesthesia; adverse effects

Bibliography

1 Pérez J, de Santos P, Plaza A, Mercadal J. Adjuvant methadone or fentanyl in spinal anesthesia with bupivacaine: a randomized, double-blind, placebo-controlled trial. *Rev Esp Anestesiol Reanim*. 2010; **57**(9): 546–52.

2 Seewal R, Shende D, Kashyap L, Mohan V. Effect of addition of various doses of fentanyl intrathecally to 0.5% hyperbaric bupivacaine on perioperative analgesia and subarachnoid-block characteristics in lower abdominal surgery: a dose-response study. *Reg Anesth Pain Med*. 2007; **32**(1): 20–6.

3 Salgueiro C, Moreno M, Arthagnan C, Peleritti H, Rempel J: Bajas dosis de bupivacaína asociada a fentanilo en anestesia espinal. *Rev Arg Anest*. 2007; **65**(6): 401–8.

Paper No: 681.00

The effect of scalp blocks with levobupivacaine on postoperative pain control and patient-controlled analgesia (PCA) consumption after craniotomy for aneurysmal clipping

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Introduction: Scalp blockade provides effect analgesia after craniotomy. Levobupivacaine is an effective local anesthetic agent for nerve blockade with less systemic toxicity than racemic bupivacaine.

Objectives. The purpose of this study is to investigate the effects of scalp blockade with levobupivacaine on postoperative pain control, hemodynamic variables and recovery profiles after anterior craniotomy for cerebral aneurysmal clipping have not been investigated.

Methods: 10 ASA I or II patients, scheduled for elective anterior craniotomies for aneurysmal clipping, were enrolled in this prospective, randomized, placebo-controlled study. Scalp block was performed by blocking the supraorbital, supratrochlear, and auriculotemporal nerves using 12 ml 0.75% levobupivacaine with 1: 200,000 epinephrine (group B, n=5) or 0.9 % normal saline (group S, n=5). Patient controlled analgesia (PCA) consisted of fentanyl 20 ¥ìg/ml (total 100 ml) was connected to patients. Postoperative headache (VAS), PCA consumption, hemodynamic variables (Heart rate [HR] and mean arterial pressure [MAP]), the use of antihypertensive drug (nicardipine) and the incidence of postoperative nausea and vomiting (PONV) and respiratory depression were recorded at 1, 2, 4, 8, 12, 24, 48, and 72 hr after alert consciousness (Glasgow coma scale >14).

Results: Statistically significant differences in postoperative pain (P=0.001) and PCA consumption (P=0.00) over time between the two groups were observed. Postoperative pain scores and PCA consumption were lower in group B than group S at 1, 2, 4, and 8 hours after alert consciousness ($P<0.05$). In addition, the use of anti-hypertensive agent (1 for group B vs.4 for group S) and the incidence of PONV (0 for group B vs.3 for group S) were lower in group B than in group S through the differences did not reach statistical significance. There were no complications related to the technique of blockade or drugs in any of the 10 patients.

Conclusions: This study demonstrated than scalp blockade with levobupivacaine effectively relieved postoperative headache and spared postoperative PCA consumption without adverse events. In addition, scalp reduced the requirement of postoperative antihypertensive agent and lowered the incidence of PONV in patients with anterior craniotomy for aneurysmal clipping.

Keywords: Levobupivacaine; scalp blockade; aneurysmal surgery; craniotomy; patient-controlled analgesia (PCA); postoperative nausea and vomitting

References

1 Bloomfield EL, Schubert A, Secic M, Barnett G, Shutway F, Ebrahim ZY. The influence of scalp infiltration with bupivacaine on hemodynamics and postoperative pain in adult patients undergoing craniotomy. *Anesth Analg* 1998; **87**: 579–82.

2 Osborn I, Sebeo J. "Scalp block" during craniotomy: a classic technique revisited. *J Neurosurg Anesthesiol* 2010; **22**: 187–94.

Paper No: 682.00

A new method for epidural space identification: lambertus's drop

Tomas E. Lambertus

Introduction: Newer local anesthetics(4), a wide range of adjuvants and improved needles will foment a more frequent use of regional anesthesia. In that sense, the journal "Anesthesia" editorializes: "... because of its high success rate, excellent safety profile and, perhaps most importantly, positive beneficial effects on outcome"(2). These approaches have motivated us to investigate procedures that make regional anesthesia even safer and more efficient.
Objectives. Many techniques have been used to aid in the location of the epidural space (ES)(1). We propose a new method for the identification of the ES, "Lambertus's drop". A technique that we present for the consideration of anesthesiologists, pretending that it be used and the obtained results later compared with previous studies.
Methods: Lambertus's technique is performed with a Tuohy needle and a three-way stopcock. The interspace is punctured up to the yellow ligament. Fill the needle's channel with anesthetic liquid. Also purge the air of the stopcock with anesthetic and then attach to the needle. Fill the remaning space in the vertical branch of the stopcock and start the advance into the epidural space. Once the tip of the needle arrives in the ES, the liquid is absorbed. Two pressures are in play in this technique. A positive pressure exerted by the column of vertical liquid and a negative pressure generated by the needle pushing the dura mater(3). Two hundred patients were anesthetized for lower limb or lower abdomen surgery. Anesthesia was performed using the technique described, as shown in the video http://www.youtube.com/watch?v=TvCBDamF4j.
Results: The results obtained with the technique were compared with studies using other methods(5). With this technique the epidural space was always found. The incidence of dura mater perforation was 0.0%.
Conclusion: The Lambertus's drop has proven a safe technique for the location of the epidural space, offering several advantages:

-The Tuohy needle can be manipulated with both hands.
-Easy visualization of the moment the epidural space is located.
-A useful tool for teaching purposes

We present a novel way of approaching the epidural space: simple, efficient and economic.

References

1 Aldrete A, Auad O, Gutiérrez V, Wright A. Alberto Gutierrez and the Hanging Drop. *Regional Anesthesia & Pain Medicine*: 2005; **30**: 397–404.
2 Harrop-Griffiths W. Regional anaesthesia – the bride at last?. *Anaesthesia*, 2010, **65** (Suppl. 1), pages pii–iv.
3 Moon J, Lee P, Sahngun F, Kim Y, Choi J. Cervical Epidural Pressure Measurement: Comparison in the Prone and Sitting Positions. *Anesthesiology* 2010; **113**: 666 –71.
4 Rose JS, Neal JM, Kopacz DJ. Extended-duration analgesia: update on microspheres and liposomes. *Reg Anesth Pain Med*. 2005; **30**: 275–285.
5 Singh J, Ranjit S, Shrestha S, Limbu T, Marahatta S. Post dural puncture headache. *Journal of Institute of Medicine*, August, 2010; **32**: 2.

Paper No: 684.00

Dexmedetomidine added to ropivacaine prolongs the duration of supraclavicular brachial plexus block

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Introduction: Dexmedetomidine is a potent alpha-2 adrenoceptor agonist and is approximately eight times more selective for the alpha-2 adrenoceptor than clonidine. Several studies have found dexmedetomidine to be well tolerated and effective in various neuraxial and regional anesthetics in humans, including during the delivery of intrathecal, caudal, and intravenous regional anesthesia. In a recent animal study, dexmedetomidine prolonged the duration of sensory blockade effectively when added to local anesthetics in a rat sciatic nerve block model.
Objectives. Our primary objective was to determine whether the addition of dexmedetomidine to ropivacaine would prolong the duration of analgesia after supraclavicular brachial plexus block for patients undergoing upper-limb surgery.
Methods: Thirty five patients undergoing upper-limb surgery were enrolled. The supraclavicular nerve block was performed with 0.7% ropivacaine 20 mL with epinephrine (1:200,000) plus either 1 mL of dexmedetomidine 1 §¶/kg with normal saline (Dexmedetomidine Group) or normal saline 1 mL (Ropivacaine Group). The onset times and durations of sensory and motor blocks, the analgesic duration, the pain numeric rating scale (NRS), postoperative opioid consumption, and side effects were recorded for 24 hr after surgery.
Results: Patients and surgical characteristics were similar in two groups. The onset times of sensory and motor block were similar in the two groups. The duration of analgesia was longer in the Dexmedetomidine Group [mean (standard deviation) 812 (126) min] than in the Ropivacaine group [692

(134) min] (p=0.010). The duration of sensory [899 (245) versus 710 (140) min] and motor block [966 (248) versus 757 (164) min] were longer in the Dexmedetomidine Group than in the Ropivacaine group (p <0.01). Pain NRS scores at 24 hr and the opioid consumption during 24 hr after surgery was similar in two groups. Systolic blood pressure in Dexmedetomidine Group at Tpacu2 was significantly lower than those in Ropivacaine Group (p<0.001). The dose of administered midazolam during surgery was smaller in Dexmedetomidine group [median (interquartile range) 2.5 (2–3.5) mg] than in the Ropivacaine group [1.5 (1–2) mg] (p=0.01).

Conclusion: The addition of dexmedetomidine to a ropivacaine-epinephrine mixture for supraclavicular brachial plexus block prolongs the duration of sensory and motor block and analgesic duration.

References

1 Addition of dexmedetomidine to bupivacaine for greater palatine nerve block prolongs postoperative analgesia after cleft palate repair. Obayah GM, Refaie A, Aboushanab O, Ibraheem N, Abdelazees M. *Eur J Anaesthesiol*. 2010 Mar;**27**(3): 280–4.

2 Addition of clonidine or dexmedetomidine to bupivacaine prolongs caudal analgesia in children. El-Hennawy AM, Abd-Elwahab AM, Abd-Elmaksoud AM, El-Ozairy HS, Boulis SR. *Br J Anaesth*. 2009 Aug;**103**(2): 268–74. Epub 2009 Jun 18.

3 Effect of dexmedetomidine on the characteristics of bupivacaine in a caudal block in pediatrics. Saadawy I, Boker A, Elshahawy MA, Almazrooa A, Melibary S, Abdellatif AA, Afifi W. *Acta Anaesthesiol Scand*. 2009 Feb;**53**(2): 251–6.

4 Perineural administration of dexmedetomidine in combination with bupivacaine enhances sensory and motor blockade in sciatic nerve block without inducing neurotoxicity in rat. Brummett CM, Norat MA, Palmisano JM, Lydic R. *Anesthesiology*. 2008 Sep;**109**(3): 502–11.

5 Perineural dexmedetomidine added to ropivacaine causes a dose-dependent increase in the duration of thermal antinociception in sciatic nerve block in rat. Brummett CM, Padda AK, Amodeo FS, Welch KB, Lydic R. *Anesthesiology*. 2009 Nov;**111**(5): 1111–9.

Paper No: 690.00

Efficacy of C5 nerve root block for postoperative pain after arthroscopic shoulder surgery

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Introduction: Arthroscopic shoulder surgery is associated with moderate and severe postoperative pain [1]. Interscalenic brachial plexus block is an effective anesthetic analgesic for shoulder arthroscopy. However it can be associated with severe side effects and patient discomfort [2].

Objective: The aim of the present study was to compare C5 nerve root block with interscalene brachial blexus block in terms of postoperative analgesia and patient discomfort after shoulder arthroscopy for rotator cuff tear.

Methods: Twenty-nine patients scheduled for shoulder arthroscopy for rotator cuff tear were enrolled and randomly assigned to interscalene brachial plexus block (n=15) or C5 nerve root block group (n=14). Interscalene brachial plexus block and C5 nerve root block were performed before induction of anesthesia and intrabursal catheter was placed at the end of surgery for patient controlled analgesia (PCA). Postoperative pain score (verbal rating scale, VRS), PCA consumption, paresthesia, paralysis and adverse event were recorded at, 2, 8, 24, and 48 h after the operation.

Results: The postoperative VRS in C5 group was comparable with that of interscalene group. The incidence of paralysis and paresthesia was significantly lower in the C5 group (4/14(29%) vs. 12/15(80%), P=0.009). There were no significant differences in adverse outcome between two groups.

Conclusions: These results confirm the analgesic efficacy and safety of C5 root block for shoulder surgery of rotator cuff tear. Selective C5 root block is as effective as interscalene brachial plexus block in the analgesic property with less patient discomfort.

References

1 Oh JH, Rhee KY, Kim SH, Lee PB, Lee JW, Lee SJ. Comparison of analgesic efficacy between single interscalene block combined with a continuous intra-bursal infusion of ropivacaine and continuous interscalene block after arthroscopic rotator cuff repair. *Clin Orthop Surg* 2009; **1**: 48–53.

2 Fredrickson MJ, Krishnan S, Chen CY. Postoperative analgesia for shoulder surgery: a critical appraisal and review of current techniques. *Anaesthesia* 2010; **65**: 608–24.

Paper No: 694.00

A randomized study to compare single injection percutaneous peribulbar anesthesia with double injection percutaneous peribulbar anesthesia for cataract extraction

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Introduction: Cataract extraction with phaco emulsification can be performed with either topical, regional or general anesthesia(1). Regional anesthesia consists of peribulbar and retrobulbar blocks. Peribulbar anesthesia was and still remains a popular choice for patients undergoing cataract surgery(2). A single-injection technique for percutaneous

peribulbar anesthesia has been suggested by some authors as an alternative to the classical double injection peribulbar anesthesia for cataract surgery because of the potential benefit of satisfactory level of anesthesia, analgesia & akinesia with fewer complications(3).

Objectives. The aim of this study was to compare these two techniques of peribulbar block.

Methods: After approval by the Hospital Ethics Committee, sixty adult patients, 18 to 70 years old of either sex, ASA status I, II or III undergoing cataract extraction under peribulbar anesthesia were included in this randomized double blinded study. After obtaining written and informed consent, patients were randomly allocated into one of the two groups. Group I: Patients in this group were given peribulbar block by single injection technique with 0.5% Bupivacaine plus hyaluronidase 15 IU/ml. Group II: Patients in this group were given peribulbar block by double injection technique with 0.5% Bupivacaine plus hyaluronidase 15IU/ml.

Results: This is an ongoing study. Statistical analysis will be performed using the program Statview 2.0 (Abacus Concepts, Berkeley, CA).The anthropometric characteristics, duration of surgery, onset of sensory and motor blocks will be analyzed by using Student's t-tests. Till now we have observed that in group I about 90% and in group II about 95% had adequate global akinesia. About 10% patients in group I and about 8% patients in group ll required supplementary injections. Scores for globe akinesia, globe anesthesia, supplemental blocks, pain on injection and surgeon satisfaction were comparable without significant statistical difference. Further evaluation at the end of the study is warranted which will be presented during the Congress.

Discussion: Single injection peribulbar block could be used as a substitute for the conventional double injection technique as it avoids the pain associated with the second injection(3). The second injection also carries a potential risk of globe perforation which can be avoided by single injection technique(4).

Conclusion: In our study, till now we have observed that single injection peribulbar block is as effective as the conventional two injection peribulbar block.

References

1 Ghali AM, Hafez A. Single injection percutaneous peribulbar anesthesia with a short needle as an alternative to the double injection technique for cataract extraction. *Anesth Analg* 2010; **110**: 245–7.

2 Singh P, Ashok Jadon, Singh BP. Single Injection versus Double Injection Peribulbar Anaesthesia in Eye Camp Surgery: a Comparative evaluation of Akinesia and Anaesthesia. *The internet journal of Anesthesiology* 2008; Volume **18** Number 2.

3 Rizzo L, Marini M, Rosati C, Calamai C. Peribulbar Anesthesia. A Percutaneous Single Injection Technique with a small volume of Anesthetic. *Anesth Analg* 2005; **100**: 94–96 .

4 Ball JL, Woon WH, Smith S. Globe perforation by second peribulbar injection. *Eye* 2002; **16**: 663–665.

Paper No: 714.00

Perioperative administration of pregabalin: Efficacy on postoperative pain and side effects

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Introduction: Pregabalin like gabapentin may be efficacious to treat acute postoperative pain [1].

Objectives. We hypothesized that pregabalin will reduce preoperative anxiety, postoperative pain and analgesic consumption in patients scheduled for abdominal hysterectomy or myomectomy.

Methods: Women aged 30–60 yr, ASA I,II undergoing abdominal hysterectomy or myomectomy, were enrolled in the study. Control group received a placebo capsule every 8 h starting the evening before surgery and for 5 days. Pregabalin group was treated similarly but with 150 mg pregabalin capsules instead. The anesthetic technique was standardized. Patients had access to PCA morphine the first 48 hours and to Lonalgal tablets on the 3rd to 5th days postoperatively. Levels of sedation, dizziness, anxiety, ataxia, diplopia and blurred vision were assessed before and one hour after placebo or pregabalin capsule intake. These variables, analgesic requirements and postoperative pain at rest and during cough were recorded 2, 4, 8 and 24 h and for five days after surgery as well as 1 and 3 months postoperatively.

Results: The 48 h cumulative morphine consumption did not differ between the placebo and pregabalin group (estimated coefficient=0.10, confidence interval (CI) -1.47 to 1.68) neither rescue analgesic requirements during the postoperative days 2–5 (estimated coefficient=0.27, confidence interval (CI) -0.59 to 1.15 p=0.525). The overall mean VAS scores at rest and cough were similar in both groups (estimated coefficient=4.73, confidence interval (CI) -0.44 to 9.90, p=0.72 and estimated coefficient=-0.58 to 14.13, p=0.71 respectively). Sedation and anxiety scores did not differ between the groups at any time point (p=0.919 and p=0.788 respectively). Pregabalin was associated with higher incidence of dizziness 1 h postoperatively (p=0.001) and blurred vision 2 and 4 h postoperatively (p=0.028 and p=0.011 respectively). Pregabalin had not effect on chronic pain development or analgesic requirements up to three months postoperatively.

Conclusions: Perioperative administration of pregabalin under the present study design did not reduce preoperative anxiety, postoperative pain and analgesic consumption in patients scheduled for abdominal hysterectomy or myomectomy.

Reference

1 Zhang J, Ho KY, Wang Y. Efficacy of pregabalin in acute postoperative pain: a meta-analysis. *Br J Anaesth* 2011; **106**(4): 454–62

Paper No: 747.00

A survey in education, resources and current practice of regional anesthesia in Argentina

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Introduction: Despite years of education, several ongoing Regional Anesthesia Centres, and recognized individual practitioners, there is no information about the current regional anesthesia practice in Argentina.
Objectives. Collect information about current practice, experience, usage and to establish future directions for continuous medical education.
Material and Methods: A survey was designed as a 20 questions on-line survey (www.surveymonkey.com). Participants were recruited via our facebook page GEAR (Study Group of Regional anesthesia). Obtained results consigned as nule or bad were grouped for analysis as NO anesthesia group; Good, very good and excellent results were considered as YES anesthesia Group. RESULTS: 57 voluntary participants completed de survey. 32% were Anesthesiologyst with less than 10y experience, 34% more than 10y and 33 % more than 15y. Lumbar epidural was judged as very good and excellent by 73.7% and good by 24.6%. Continuous epidural NO 21.8%, 78.6% YES, Thoraxic epidural: NO 52.7%. Spinal: YES 93%, Continuous Spinal NO 76.8% Thoraxic Spinal NO 89% Upper extremity nerve blocks Upper Extremity BLOCK % NO ANESTHESIA % YES ANESTHESIA IES29 71 2 SC36 63 3 IC 4555 AX18 82 1 MidH 55 45 Elbow 47 52 Bier 48 52 Wrist 44 56 Finger 43 56 Lower extremity nerve blocks Lower extremity Block%No Anesthesia % YES Anesthesia Psoas 91 9 Femoral 49 51 2 Obturador 77 23 Iliofascial 74 26 Parasacral 72 28 Sciatic 64 36 Subgluteal 72 28 Popliteal 49 51 3 Saphenous 66 34 Local intraart67 33 Ankle 34 66 1 Foot fingers 55 45 Technical: 75% used PNS and isolated needles and 26% Portable Ultrasound. Between 76% and 91% considered necessary to update their knowledge. Short rotation with experts, workshops with living models and visiting experts were ranked in that order as the prefered activities.

Discusion. Number of participants was low but well distribuited in all the country. Most common performed upper and lower extremity blocks were axillary, interescalene, supraclavicular, ankle, femoral and popliteal. An effort will be made to increase practice of under used regional techniques and resources.
Conclusions: Obtained data will be usefull to design orientated regional anesthesia education programs.

Paper No: 769.00

Outpatient peripheral nerve block (pnb) analgesia for 2,171 orthopedic procedures: comparison of equal volumes of 0.25% and 0.5% bupivacaine, both with 100 mcg clonidine is there a difference in analgetic duration?

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Introduction: Patient satisfaction is affected by achieving a balance between highly successful blocks, of sufficiently long analgesia, with a low risk of intravascular injection of local anesthetic.
Objectives. We standardized local anesthetic volumes, concentrations, and adjuvants. Clonidine, 100 mcg in one ml, was added to equal volumes of 0.25% and 0.5% bupivacaine, with the goal of reducing total local anesthetic dosage. Any incident of anesthetic systemic toxicity (LAST) was recorded.
Methods: All single shot PNB's were placed with live ultrasound guidance, at a single institution, by seven highly proficient anesthesiologists. Interscalene (ISB) and axillary (AXB) blocks were done with a total volume of 25 ml's. All femoral (FNB) and popliteal fossa (PFB) blocks utilized 30 ml's of local anesthetic. All PNBs included clonidine. Common surgical procedures ranged from ORIF of upper/lower extremities, to ACL reconstruction, and shoulder arthroscopy, with or without open repairs. Data was collected from standardized PNB records, and by anesthesiologists' postop phone calls to patients. Patients were asked, "At what time did you first feel pain, and/or feel the need to take your first oral analgesic medication? ". Successful PNB was defined as a patient free of pain, in the expected neurologic anatomy, at discharge.

Results: Single shot PNBs numbered 2,171 over three years. Success rates were: ISB 99.5%, AXB 99.6%, FNB 98.95%, and PFB 99.3%. Duration of analgesia by block type, with SD (in hours). Number of blocks is in ( ).

0.25% w/ C	0.5% w/C
p value	
ISB (250)	18.6
SD 4.4 (488)	20.2
SD 5.0	<0.05
AX (72)	17.5
SD 4.2 (654)	19.1
SD 5.3	<0.05

FNB (141)	23.4
SD	6.6
PFB (181)	24.0
SD	5.7
(290)	26.8
SD	6.7
(200)	24.6
SD	6.4
<0.05	<0.05

There were no instances of LAST in either group.

Discussion: McCartney's 2007 review concluded "evidence does not support...adding clonidine to long acting local anesthetics". 1 In 2009, Popping's meta- analysis revealed that 150 mcg of clonidine with bupivacaine for AXB added two hours of analgesia.2

Our incidence of LAST is less than literature reported 1 in 1,000 blocks.3

In 2009, Lui reported success rates for upper extremity blocks of 95–100%, and 97% for popliteal blocks.4 Our experience supports this rate.

Conclusion We have demonstrated that a reduced bupivacaine concentration, with low dose clonidine, preserves desirable analgetic duration, without affecting safety.

References

1 McCartney CJ. Should We Add Clonidine to Local Anesthetic for Peripheral Nerve Blockade? A Qualitative Systematic Review of the Literature. *Regional Anesthesia and Pain Medicine* 2007; **32**: 330–338.

2 Popping DM. Clonidine as an Adjuvant to Local Anesthetics for Peripheral Nerve and Plexus Blocks. *Anesthesiology* 2009; **111**: 406–415.

3 Barrington MJ. Preliminary Results of the Australasian Regional Anaesthesia Collaboration. *Regional Anesthesia and Pain Medicine* 2009; **34**: 534–541.

4 Liu SS. Ultrasound-Guided Regional Anesthesia and Analgesia. *Regional Anesthesia and Pain Medicine* 2009; **34**: 47–59.

Paper No: 799.00

Effectivness of the continious compartment block(CPCB) after total knee arthroplasty

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Introduction and objectives. Total knee arthroplasty(TKA) is a major orthopedic procedure with severe postoperative pain.We decided to improve traditional pain menagement (iv, Epidural.) with continious psoas compartment block (CPCB) after TKA and study its effectivness.

Methods: Retrospectively were analyzed 82 patients,age 67–92 years old,ASA I-III,operated in 2010/2011.CPCB was performed before surgery with Contiplex Tuhou 18G(B.Braun AG,Germany) 100mm needle with catheter and Stimuplex (B,Braun AG,Germany)nerve stimulator.Patient was in lateral position with upper leg flexed.Puncture was at level L4,5cm lateral and 3cm caudal.M.Quadriceps contraction at 0,5–0,8 mA (o,1ms)was consider as an adequate response.After negative aspiration,catheter was placed 6–8 cm deep inside.PCA pump(CADD Legacy,Smith Medical,UK)was used for continious infusion of 0,2% levobupivacain (6–10 ml/h, 4ml bolus doze and 30 minutes lock out),started half an hour before the end of the procedure. CPCB was maintained 72 hours. Active mobilization started 24 hours after the operation. Visual Analog Scale (VAS) was used for postoperative pain evaluation.

Results: Out of total 82 subjects,43 were male,39 were female.In 96% CPCB was successfull.4% had an inadequate analgesia(VAS greater than 8) and Pyritramid 3mg iv. was added supplementary.Four patients had m.quadriceps weekness,when physical rehabilitation started.No complication related CPCB was noticed.Patients satisfaction was 96%.There were no difference between male and female groupe.Mobilisation wasbetter and more comfortable.There were no systemic or neurological side effects.Improvement of the quality of rehabilitation were noticed.

Conclusion: Our study proved that Continious psoas compartment block(CPCB) is clinicly safe,usefull and effective technique for pain teatment after total knee arthroplasty(TKA).

References

1 Winnie AP, Ramamurthy S, Durrani Z, Radonjic R. Plexus blocks,for lower extremity surgery:new answers to old problems, Anesth. *Rev.* 1974; **1**: 11–6

2 Chudinov A, Berkenstadt H, Salai M, *et al.* Continious psoas compartment block for anesthesia and perioperativ analgesia in patients with hip fractures. *Reg. Anesth. Pain Med.*1999; **24**: 563–8

3 Capdevila X, Macaire P, Dadure C, Choquet O, Biboulet P, Ryckwaert I, D Athia F, Continious Psoas Compartment Block for postoperative Analgesia After Total Hip Arthroplasty: New Landmarks, Technical Guidelines, and Clinical Evaluation. *Anesth. Analg.* 2002; **94**: 1606–13

Paper No: 810.00

Determining Minimal Effective Concentration of Bupivacaine for Ultrasound Guided Axillary Brachial Plexus Block

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Introduction: The axillary block is one of the most used techniques of anesthesia for hand surgery. Usually it is obtained with large volumes of local anesthetic, increasing the risk of toxicity. The ultrasound guidance allows volume reduction for the block. Should reduction in concentration effectively perform surgical anesthesia, while minimizing the risks of toxicity, once ultrasound guidance can improve local anesthetic spread around the nerve?
Objective: To calculate the minimal effective concentration of bupivacaine without epinephrine for successful axillary brachial plexus block for hand surgery in 90% of the patients (MEC90).
Methods: After given written informed consent signed by ASA 1 and 2 adult patients scheduled for ambulatorial hand surgery, the axillary brachial plexus block was achieved using ultrasound and nerve stimulation before local anesthetic injection. This procedure was performed for median, radial and ulnar nerves. The study method used was a step-up/step-down sequence model where the concentration used for following patients was determined by the outcome of the preceding block. The starting dose was 5 mL of bupivacaine 0.5% per nerve. In the case of block success, the concentration was reduced by 0.05%. Conversely, any nerve block failure resulted in a increase in concentration by 0.05% for the next patient. The concentration was increased in 0.05% at every 5 consecutive cases regardless of the result of the previous block in order to minimize bias occurence. A blinded assistant assessed sensory and motor blockade. Surgical anesthesia was defined as a motor score of 2 or lower on a modified Bromage Scale, with absent appreciation of cold and pinprick sensation. If block failed, complementation of the blockade was performed in order to allow surgical procedure. All patients received continuous infusion of propofol to achieve score 3 on Ramsay Sedation Scale. The defined study-stopping rule was after 3 cycles of failure/success. The MEC90 was obtained with a non-linear regression of the exponential decay phase.
Results: The study reached a total of 20 patients. All 4 cases where 0.20% was used were successful. And all 3 cases of 0.15% failed. The MEC90 calculated was 0.19% with correlation coefficient R^2=0.97.
Conclusion: We suggest that using ultrasound guidance with nerve stimulation it is possible to obtain surgical anesthesia with doses as lower as 5 mL of bupivacaine 0.19% per nerve in the axillary approach of brachial plexus block. However in order to verify the efficacy of the calculated MEC90 further clinical trials are suggested.

References

1 Morgan GEJ, Mikhail MS, Murray MJ. Peripheral Nerve Blocks. *Clinical Anesthesiology*, 4th edition), 2006:324–58
2 Jeng CL, Torrillo TM, Rosenblatt MA. Complications of peripheral nerve blocks. *British Journal of Anaesthesia* **105** (S1): 97–i107 (2010)
3 Vester-Andersen T, Christiansen C, Sørensen M, Kaalund-Jørgensen HO, Saugbjerg P, Schultz-Møller K: Perivascular axillary block II: In?uence of injected volume of local anaesthetic on neural blockade. *Acta Anaesth Scand* 1983; **27**: 95–8
4 Fanelli G, Casati A, Garancini P, *et al.* Nerve stimulator and multiple injection technique for upper and lower limb blockade: failure rate, patient acceptance, and neurologic complications. *Anesth Analg* 1999; **88**: 847–52
5 Perlas A, Niazi A, McCartney C, *et al.* The sensitivity of motor response to nerve stimulation and paresthesia for nerve localization as evaluated by ultrasound. *Reg Anesth Pain Med* 2006; **31**: 445–50
6 O'Donnell BD, iohom G. An estimation of the minimum effective anesthetic volume of 2% lidocaine in ultrasound-guided axillary brachial plexus block. *Anesthesiology*, 2009; **111**: 25–9
7 Vesper-Andersen T, Husum B, Lindeburg T, *et al.* Perivascular axillary block IV: blockade following 40, 50 or 60 mL of mepivacaine 1% with adrenaline. *Acta Anaesthesiol Scand*. 1984; **28**: 99–105

Paper No: 826.00

The Comparison of Isobaric Bupivacaine and Morphine Combinations Applied in Various Dosages During Transurethral Resections under Spinal Anesthesia

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Objectives. In this study, we aimed to compare the effects of three different doses of isobaric bupivacaine application combined with morphine on postoperative analgesia, motor and sensory blockade and anesthesia quality in patients undergoing transurethral resection of the prostate (TUR-P) under spinal anesthesia.
Methods: 60 patients all above the age of 55 undergoing transurethral resection of the prostate (TUR-P) were randomly divided into 3 groups receiving 5.0 mg (Group I, n=20), 7.5 mg (Group II, n=20), 10 mg (Group III, n=20) of isobaric bupivacaine. In each group, 100 ?g of morphine was added to drug in order to complete the final volume of administration to 3 cc. Hemodynamic parameters, motor and sensorial blockade, the time of the first postoperative analgesia requirement, intra and postoperative adverse effects of spinal anesthesia were then recorded.

Results: Maximum sensorial blockade levels in the groups revealed to be T10, T8 and T6, respectively. As the sensorial block levels of the groups were evaluated during the procedure, a higher level was detected in group III, although it was observed to be stable in groups I and II. Changes in hemodynamic parameters were found to be correlated. There was a significant difference in terms of hypotension between the groups. In groups II and III, hypotension was detected to be more frequent compared to group I (p=0,047 and p<0,001). There were no statistically significant differences between groups II and III in terms of hypotension frequency (p=0,102). Bradycardia was detected in 1 patient in Group I (%5), 4 patients in Group II (%20) and 10 patients in Group III (%50).The time to reach T10 dermatome blockade was shorter in Group II and III than in Group I. Two dermatome regression time of sensory block was shorter in Group I when compared to Groups II and III. Besides, regression time of sensory block for two dermatomes in Group II was shorter than in Group III. There were no statistically significant differences among the groups regarding demographic characteristics, and sensory and motor block onset times. Patient and surgeon satisfaction revealed to be significantly higher in Group III than in Groups II and I.

Conclusion: For transurethral prostate surgery of elderly patients with morbid diseases, low dose isobaric bupivacaine in addition to morphine can provide stable hemodynamic profile, patient and surgeon satisfaction and effective sensorial and motor blockade in spinal anaesthesia.

References

1 Murphy PM, *et al.* Anaesth Analg 2003; **97**: 1709–15.
2 Vanna O, *et al. J Med Assoc Thai* 2006; **89**: 1133–39.

Paper No: 833.00

Analgesia after inguinal hernia repair. ilioinguinal iliohypogastric block vs. transversus abdominis plane block. a randomized controlled trial

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Introduction: Postoperative pain in inguinal hernia repair is moderate to severe and is associated with chronic postoperative pain. Some anesthesiologists use Ilioinguinal Iliohypogastric (IIIH) block or Transversus abdominis Plane (TAP) Block for treat this pain. Recent data have suggested that ultrasound-guided IIIH block is more effective that TAP block especially in children. This randomized study tested the hypothesis that the ultrasound-guided IIIH block would provide better analgesia than TAP block for inguinal hernia repair surgery in adults.

Objective: To show the difference in analgesia, time to discharge and satisfaction between patients presenting for inguinal hernia repair who receive a TAP or an IIIH block.

Materials and methods. Before induction of general anesthesia, patients presenting for elective inguinal herniorrhaphy were randomly assigned to receive an ultrasound-guided TAP block (n=53) or ultrasound-guide ilioinguinal iliohypogastric block (n=57). Supplemental analgesia consisted of intraoperative diclofenac 1 mg/Kg, dipyrone 30 mg/Kg and rescue hydromorphone. Patients were assessed 1 hour and 24 hours after the surgery for numerical pain score, rescue opioid needs, time to discharge from the recovery room and satisfaction. Investigators whom made the interviews in the post operative period were blinded of the primary intervention.

Results: In the first postoperative hour, pain was more frequent in the TAP group (70% vs 47%, P=0.0171). Rescue analgesia requirements were signifi¬cantly lower in the ilioinguinal ilihypogastric group (7,5% vs 22,6%, P Yates correction=0,0402). Time to discharge from the recovery room more than 1 hour, was more frequent in the TAP group (35,8% vs 16,3%, P=0,0079), similar to pain before 6 hours after surgery (TAP: 26,4% vs II-IH: 5,5%, P Yates Correction=0,0051). Satisfaction and time to perform the block was similar in both groups. No complication in any group was recorded.

Discussion: Anterior abdominal wall blocks effectiveness has been increased by the ultrasonography, it is that why IIIH block and TAP block are extensive used actuality in surgery of the abdominal wall. Although TAP block could be useful like an analgesic strategy for the inguinal surgery like Tanaka and Aveline showed, IIIH block could be more effective in inguinal hernia repair especially in the immediate postoperative period.

Conclusion: Following inguinal herniorrhaphy surgery, IIIH block provides more effective analgesia than TAP block.

Paper No: 847.00

Single injection of femoral nerve block for bilateral total knee arthroplasty for post-operative pain management

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Introduction: In the elderly major knee surgery can result in severe postoperative pain which can have serious impact on the physical state and quality of life of the patient.

Objective: A single injection of femoral nerve block with 0.25% levobupivacaine preoperatively reduces pain in patients undergoing simultaneous bilateral total knee arthroplasty.
Methods: 40 patients undergoing simultaneous bilateral total knee arthroplasty were randomized to receive 20ml of 0.25% levobupivacaine for one knee and 20ml of saline for the other knee (placebo).Post operatively the intern who was blinded as to which knee received the levobupivacaine recorded the Visual Analog Score (VAS) of pain for both knees at preoperative, 6, 24 and 48 hours postoperatively. All patients also received peri-articular cocktail of either 0.5% bupivacaine with adrenaline (20mls) or 0.75% ropivacaine (20mls) with triamcinolone 40mg, vacomycin 500mg and saline 40mls (60mls in total). Post operatively the patients were also given intravenous parecoxib 40mg, T.Paracetamol 1000mg PO TID and T.Tramadol 50mg PO TID for pain.
Results: The average preoperative pain score was 6.5. The average postoperative pain score at 6, 24, 48 hours for the levobupivacaine side was 2.4, 3.2 and 3.4 respectively and 5.8, 5 and 4 for the placebo side. The knees which received the levobupivacine for the femoral nerve block were able to be mobilized on the first post-operative day compared to the second post-operative day for the placebo side.
Conclusion: There was effective pain relief with a single injection of 0.25% levobupivacaine for the femoral nerve block compared to the placebo in patients undergoing simultaneous bilateral total knee arthroplasty.

References

1 Journal Clinical Anaesthesia 2008 Nov,20(7)521–7: Single injection FNB with 0.25% bupivacaine for post-operative analgesia after TKR or Anterior Cruciate Ligament Reconstruction.
2 Regional Anaesthesia & Pain Medicine. 2003, Jan-Feb, 28(1)29–32: Femoral Nerve Block provides superior analgesia compared with intraarticular ropivacaine after Anterior Cruciate Ligament Reconstruction.
3 Anaesthesiology, V 113, No5, Nov 2010: Femoral Nerve Block Improves Analgesia Outcomes after Total Knee Arthroplasty. BJA 100(2): 154–64(2008): Epidural Analgesia Compared with Peripheral Nerve Blockade after Major Knee Surgery: A systemic review and meta-analysis of randomized trials.

Paper No: 850.00

The post-operative analgesic efficacy of parecoxib compared with celecoxib and placebo after lower limbs orthopedic surgeries

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Introduction: Nonsteroidal antiinflammatory drugs (NSAIDs) in combination with opioids are a model of multimodal analgesia.1–2 NSAIDs have the oral and parenteral forms. That recommended for multimodal postoperative pain management. Objectives: The aim of the present study was to evaluate the efficacy of parecoxib compared with celecoxib and placebo after lower limbs orthopedic surgeries.
Methods: The investigation was carried out as a prospective randomized double blind placebo controlled trial. A total of 120, ASA I-II, aged 18–60 years, patients were randomly assigned to receive one of the three groups: Group I (control) received placebo (n=40), group II received 400 mg celecoxib orally (n=40) and group III received 40 mg parecoxib intravenously (n=40). The present study medication was administered 1 hour before surgery. All patients had access to patient-controlled analgesia (PCA) with intravenous morphine. Patients were studied at 1,6,18 and 24 hours postoperatively for Visual analog scale (VAS) pain scores, morphine consumption and side effects, and tramadol requirement.
Results: Celecoxib and parecoxib significantly decreased the amount of morphine requirement after lower limbs orthopedic surgeries compared to placebo at 1, 6, 18 and 24 hours ($p=0.016$). The celecoxib group required more morphine than the parecoxib group at 1, 6, 18 and 24 hours ($p=0.065$). The Resting VAS score in parecoxib group was significantly lower than the celecoxib and control groups at 1,6,12 and 24 hours. The Resting VAS score was lower in the celecoxib group compared to the control group at 1,6, ($p=0.0001$), 18 and 24 hours postoperatively ($p=0.001$). The placebo group had a higher post-operative nausea/vomiting severity ($p=0.002$). Although patients suffering from constipation decreased from 25% in placebo group to 5% and 15% in parecoxib and celecoxib groups, respectively, this was significant ($p=0.043$). There were no differences in tramadol requirements and urinary retention between the groups, ($p>0.05$).
Discussion: A multimodal analgesic approach is recommended for the management of perioperative pain. 3–5 Within 24 hours after lower limbs orthopedic surgeries, preoperative administration of parenteral parecoxib 40 mg was more effective than oral celecoxib 400 mg and placebo in terms of morphine consumption and Resting VAS score.
Conclusion: Perioperative parecoxib significantly improved postoperative resting pain scores at 1,6,18 and 24 hrs, opioid consumption, after lower limbs orthopedic surgeries, without increasing the side effects.

Paper No: 852.00

Do laser tonsillectomies need less opioids as compared to standard tonsillectomies: a

retrospective comparison of peri-operative analgesic requirement

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Introduction: Laser tonsillectomies (inside-out laser vapourisation tonsillectomy involves the tonsil being vapourised with scanned carbon dioxide laser) are increasingly done in surgical practice for both palatine and adeno-palatine tonsillectomies. With this technique it is possible to accurately remove all the tonsillar tissue leaving the tonsillar capsule intact. The delicate tissue below the tonsil is not exposed. As a consequence, this technique is associated with decreased analgesic requirement in the peri-operative period.
Objective: The primary aim of this retrospective case series was to compare the opioid requirements in patients undergoing laser tonsillectomies with standard tonsillectomies. We audited the postoperative morbidity after tonsillectomies, including analgesic requirements, pain scores and complications.
Methods: Following the hospital's audit committee approval, data was collected for patients undergoing laser and standard tonsillectomies over sixteen months. Data included demographic data, type of tonsillectomy, peri-operative analgesic requirements and unexpected complications including overnight admission. The data was analysed using Fischer exact statistical test with two-tailed p value.
Results: Records were analysed for 61 patients (47 adults and 14 children, 3–16 years) undergoing elective tonsillectomies in a private hospital in UK from July 2009 to October 2010. 52.4% (n=32) patients had standard tonsillectomies (ST) and 47.6% (n=29) had laser tonsillectomies (LT). The demographic data was comparable. All patients received short-acting opiate at induction. Patients in the LT group had significantly less long-acting intra-operative opiate usage ($p<0.005$). 43.7% (n=14) patients undergoing standard tonsillectomies had an unexpected overnight admission attributed to postoperative pain management. The duration of surgery was statistically significantly between ST 51min v/s LT 31 min ($p< 0.005$.)

Standard Tonsillectomy n=32 (%)	Laser Tonsillectomy n=29 (%)	
Pt receiving long-acting intra-operative opiates	27 (84)	6 (20.7)
Pt having post-operative pain	16 (50)	15 (51.7)
Pt requiring post-operative analgesia	30 (93.8)	19 (65.5)
Unexpected overnight admission (due to pain)	14 (43.7)	0 (0)
Surgical duration	51.8 min	31.1 min

Discussion: This retrospective case series highlights the difference in opioid requirements in the two techniques of tonsillectomies: standard versus laser. Patients undergoing laser tonsillectomy demonstrated a significantly reduced need of peri-operative opioid analgesia. This group also had early discharge with none of the patients needing overnight admission. This data however needs to be corroborated with randomised controlled studies.
Conclusion: Our audit shows that laser tonsillectomy is a safe surgical procedure that has a better analgesic and time profile than standard tonsillectomies

Reference

1 Kramer SP, Pasha R. (2005). Otolaryngology: Head and Neck Surgery–A Clinical & Reference Guide, Second Edition. Plural Publishing. ISBN 1-59756-023-5.

Paper No: 859.00

A retrospective review of anaesthetic practice and surgical intervention in carotid endarteretomy (cea) operations over a two year period

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Introduction: The anaesthetic management of CEAs is constantly under debate[1]. Symptomatic carotid artery stenosis (>50%) is the most common indication[2].
Objective: This study was designed to review our anaesthetic practice of intraoperative management of CEAs, over a two year period from August 2008 to August 2010.
Methods: All patients undergoing a CEA within this period were included and demographic data collected. Variables identified included type of anaesthesia (general or regional, including conversions), airway management, regional anaesthesia (RA) block type, superficial cervical (SCPB) or deep cervical plexus (DCPB) and type, volume and concentration of local anaesthetic agent together with type of intravenous sedative drugs. Furthermore, note was made of use of cerebral oximetry (a reduction of 20% being considered significant). Additionally data on the number of intraoperative shunts used was collated.
Results: 117 patients in total underwent CEA, median age 74. 76 (65%) were male and 41 (35%) female. 17 (14.5%) underwent general anaesthesia (GA), compared to RA in 100 (85.5%); conversion to GA occurred in 8 (8%). Airway management in GA was with endotracheal intubation in 21 (84%) and supraglottic devices in 4 (16%). SCPB was used in 100% (100) of RAs, being combined with DCPB in 13% (13). Bupivacaine was used in all RAs, mean dose 79.3mg, volume 25ml, and concentration 0.31%. 81 (81%) of the RA

cases received intravenous sedation. 8 (8%) of cases were converted to GA; 6 (75%) originally under SCPB, 2 (25%) under SCPB and DCPB. 41.2% (7) of GA cases used INVOS; in 89% (63) there was no significant change. 62% (62%) of RA cases also used INVOS; in 3 (4.8%) neurological symptoms occurred, associated with a significant INVOS reduction in 2. Shunt insertion occurred 7 times including the 3 cases with neurological symptoms.

Discussion: Majority of cases are RA with SCPB using 0.25% B. Conversion rate of 8% is higher than expected (1.4%[1]) although we found no clear contributing factors. Conclusion The use of DCPB has declined at our institute and does not appear to have affect conversion rates to GA (15.3%) compared to (6.9%). No complications of RA were recorded.

References

1 GALA Trial Collaborative Group. General anaesthesia versus local anaesthesia for carotid surgery (GALA): a multicenter, randomized controlled trial. *Lancet* 2008; **372**: 2132–42

2 Liapis et al. ESVS Guidelines. Invasive Treatment for Carotid Stenosis: Indications, Techniques. *Eur J Vasc Endovasc Surg* 2009; S1–S19

Paper No: 864.00

Clinical effects of sympathetic ganglion block on long-term phantom limb pain

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Introduction: Phantom limb pain can be relieved by sympathetic nerve block (SNB) in some cases (1). These cases are usually early stage from the symptom onset. We treated long-term phantom limb pain patient and showed effectiveness of SNB.

Objective: To evaluate the effectiveness of lumbar sympathetic ganglion block for long-term phantom limb pain.

Methods: 55-y male patient with continuous severe phantom pain of left leg injured eleven years ago received lumbar sympathetic ganglion block. He was tested for the effectiveness of epidural block at L1–2 interspace, and accepted next lumbar sympathetic ganglion block with ropivacaine, and with 99.5% alcohol at last. He had been treated with amitriptylin and gabapentin and in addition, transcutaneus electric nerve stimulation (TENS) for two years. He had also experienced other administrations of phenytoin, carbamazepin, pregavalin during eight years period.

Results: Phantom pain was relieved completely during five days after lumbar epidural block, twelve days after lumbar ganglion block with ropivacaine and over one month after lumbar sympathetic ganglion block with alcohol, accompanied by remained feeling of paresthesia of phantom.

Discussion: Transient blocks of sympathetic nerve with local anesthetic showed long lasting effects. It is likely that preganglionic sympathetic nerve neurons were activated strongly in spite of decreasing afferent neurons activities by stimulations. Excitations of central nervous system (CNS) following central neuroplasticity due to leg amputation may be controlled by drugs and TENS. Amitriptylin and TENS are expected to enhance descending inhibitory system. Gabapentin is reported to inhibit excitatory synapse formation binding $f¿2f$Â-1 receptor in the CNS (2). Sympathetic nerve system might not be affected directly by those drugs such as amitriptylin or gabapentin and TENS. Excitation of sympathetic nervous systems seems to be suppressed only by blocks.

Conclusion: The long-term phantom limb pain was relieved completely by lumbar sympathetic ganglion block.

References

1 Bonica JJ: Management of pain with regional analgesia. *Postgraduate Medical Journal* 1984; **60**: 897–904

2 Eroglu G, Allen NJ, *et al.*: Gabapentin Receptor $f¿2f$Â-1 is a Neuronal Thrombospondin Receptor Responsible for Excitatory CNS Synaptogenesis. *Cell* 2009; **139**: 380–392

Paper No: 865.00

Analgesia for Laparoscopic Colorectal Surgery: An International Survey

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Introduction: Traditionally epidural analgesia is considered as gold standard for open colorectal surgery. However, with the increasing popularity of the laparoscopic approach to colorectal surgery, the use of epidural is questionable. There is a paucity of data available on best analgesic regimen following laparoscopic colorectal surgery.

Objective: Our objective was to identify if the centre surveyed has an enhanced recovery program in place and if there is an agreed departmental protocol for analgesia, the use of regional anaesthesia as part of a multimodal technique with special emphasis on intrathecal opioids and any adverse effects attributable to analgesic regimes.

Methods: A web based electronic survey form, was circulated via emails to anaesthetists at 20 international centres, including 12 centres in the U.K. from May 2011 to Aug 2011. Questions were designed to identify the analgesic regimes specifically for laparoscopic colorectal surgery and any impact on enhanced on recovery postoperatively.

Results: There was a response rate of 80%(16 of 20 centres). Enhanced recovery or fast track program is implemented, either fully or partially at 84% of the centres and a departmental analgesia protocol existed only in 34% of the centres. Partial implementation included no routine bowel preparation and avoidance of nasogastric tube insertion. Intraoperative analgesia included Paracetamol (80%), intravenous opioids, spinal anaesthesia with intrathecal opioid (44%) and epidural analgesia (40%). Patient controlled analgesia (intravenous morphine) was the predominant postoperative analgesic (76%). Most centres used regional analgesia in the form of wound infiltration (60%) or transversus abdominal plane block. Adverse effects reported are uncommon and included hypotension with the use of epidural analgesia, itching with intrathecal opioid and postoperative nausea and vomiting with opioid based analgesia.
Conclusion: There seems to be an increased uptake of the enhanced recovery program in many centres. There is no consensus on most suitable analgesic regime following laparoscopic colorectal surgery. Patient controlled opioid analgesia, as part of multimodal analgesia seems to be the most common technique used in the postoperative period. There seems to be a decline in the use of epidural analgesia. Multicentre trials are required to determine the most appropriate analgesic regime.

References

1 Levy BF, Scott MJ, Fawcett W, Fry C, Rockall TA. Randomized clinical trial of epidural, spinal or patient-controlled analgesia for patients undergoing laparoscopic colorectal surgery. *Br J Surg.* 2011 Aug; **98**(8): 1068–78.
2 Levy BF, Tilney HS, Dowson HM, Rockall TA. A systematic review of postoperative analgesia following laparoscopic colorectal surgery. Colorectal Dis. 2010 Jan; **12**(1): 5–15.

Paper No: 877.00

A retrospective study comparing complications of low dose Dexmedetomidine on Isobaric Levobupivacaine and Bupivacaine spinal block for urologic surgery

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A retrospective study comparing complications of low dose Dexmedetomidine on Isobaric Levobupivacaine and Bupivacaine spinal block for urologic surgery
Introduction: A previous study shown equally effective potencies for spinal anesthesia of isobaric levobupivacaine and heavy bupivacaine but more complications (1). Dexmedetomidine (3 ?g) when added to intrathecal bupivacaine, produces a similar prolongation in the duration of the motor and sensory block with preserved hemodynamic stability and lack of sedation (2). Added low dose of Dexmedetomidine might be improved the out come of previous study.
Objectives. To compare complications of added 3 ?g Dexmedetomidine on isobaric levobupivacaine and heavy bupivacaine for urologic surgery.
Methods: Retrospective comparative study of 887 patients non premedication schedule for elective surgery in urology unit by spinal anesthesia during 1 July 2010– 31 March 2011 allocated simultaneously by anesthesiologist experience service into two groups to receive either Isobaric Levobupivacaine added 3 ?g Dexmedetomidine of 318 patients and heavy bupivacaine of 568 patients. NIBP, ECG, SPO2 for monitored and recorded anesthetic complications.
Results: Sex, age, weight, height, ASA physical status, dosage (2.47 & 2.46 ml), diagnosis, operation, onset time and operative time were no significant difference. Significant longer onset time (18.16 & 16.62 min, $p=0.02$), higher percentage level of block of T8–T10 (62.14% & 48.41%, $p<0.001$) lower high block level of T2–7 (29.02% & 42.40%, $p<0.001$), lower intra-operative (24.53% & 32.24%, $p=0.016$) and lower total complication (31.51% & 68.49%, $p=0.056$) in added 3 ?g Dexmedetomidine on Isobaric Levobupivacaine group with lack of sedation. Common complications intra-operative were hypotension (17.70%), braddycardia (6.31%), shivering (5.52%). Recovery room complications were shivering (3.27%), hypotension (0.90%), braddycardia (0.90%), nausea/ vomiting (0.67%) respectively.
Conclusions: Dexmedetomidine 3 ?g when added to intrathecal Isobaric Levobupivacaine produced slow onset time and reach higher percentage desired level with lower high block level, preserved hemodynamic stability with lack of sedation, that could be lower complications.

References

1 Vanna O, Chumsang L, Thongmee S. Levobupivacaine and Bupivacaine in Spinal Anesthesia for Transurethral Endoscopic Surgery. *J Med Assoc Thai* 2006; **89** (8): 1133–9
2 Kanazi GE, Aouad MT, Jabbour Khoury SI, Al Jazzar MD, Alameddine MM, Al Yaman R, Bulbul M, Baraka AS Effect of low-dose dexmedetomidine or clonidine on the characteristics of bupivacaine spinal block. *Acta Anaesthesiol Scand* 2006; **50**: 222–227

Paper No: 882.00

Predictive risk factors for in-hospital neurological morbidity in patients undergoing carotid endarterectomy under cervical plexus block

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Introduction: Carotid endarterectomy (CAE) is one of the most frequently performed vascular surgical procedures. Cervical plexus block (CPB) is a safe and effective anesthetic technique which allows continuous neurological assessment of an awake patient during surgery.[1,2]
Objective: The aim of this study was to evaluate predictive risk factors associated with in-hospital perioperative neurological morbidity in patients undergoing CAE under CPB.
Methods: After obtaining approval from IRB, 483 patients scheduled for CAE under CPB were included in the study. The primary outcome measure was in-hospital neurological morbidity which was classified as transient neurological deficit (TND) or stroke. The following risk factors for an adverse neurological event were assessed using univariate analysis: age, gender, ASA status, preoperative neurologic status, carotid cross clamping time and the use of intraluminal shunt. All factors that met a univariate significance criterion of a P value$<$0.05 were entered into a multivariate, regression model to assess their independence as predictors of adverse events. The value of P$<$0.05 was considered statistically significant.
Results: There were 25 (4.7%) adverse neurological events, 15 (2.8%) of which were classified as stroke. Patients in whom an intraluminal shunt was inserted had approximately five times the rate of neurological morbidity compared with the patients with no indications for shunt insertion. (18.7% and 3.8%, respectively). Other factors associated with significantly higher risk of perioperative neurological morbidity included age$>$60 years, ASA status$>$II and the history of preoperative stroke/TND. However, only a preoperative stroke/TND and the use of intraluminal shunt to protect cerebral perfusion during carotid cross-clamping were independently associated with triple the risk-adjusted odds of a new neurological deficit.
Conclusions: A preoperative stroke/TND and intraoperative insertion of intraluminal shunt are shown to be independent predictors of in-hospital adverse neurological events in patients undergoing CEA under cervical plexus block.

References

1 Hariharan S, Naraynsingh V, Esack A, *et al.* Perioperative outcome of carotid endareterctomy with regional anesthesia: two decades of experience from the Caribbean. *J Clin Anesth* 2010; **22**: 169–73.
2 Mayer RC, Bingley J, Westcott MJ, *et al.* Intraoperative neurological changes in 1665 regional anaesthetic carotid endarterectomies predicts postoperative stroke.

Paper No: 888.00

Ultrasound-guided continuos paravertebral block in thoracic surgery: description of a new technique

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Introduction: The paravertebral block (PVB) for analgesia produces an unilateral somatic and sympathetic nerve block, by blocking the efferent spinal nerves; widely used in thoracic surgery. Compared to epidural space location, paravertebral space location is more difficult and may not be distinct. PVS location by this technique may be difficult in obese or very muscular patients and in patients with previous thoracotomy and scar tissue in the PVS. Difficulty is commonly encountered during catheter insertion.
Objectives. We are presenting a novel technique, based on a prior description of an ultrasound-guided single injection block technique, that enables to safely evaluate the cathetéŕs direction and location in the paravertebral space.
Methods: 105 patients were included in the study, which consecutively underwent a posterolateral thoracotomy. The ultrasound investigation was performed as follows: the patient is positioned in prone position. Positioning a high-frequency ultrasound probe to scan the thoracic vertebral area in order to locate the spinous and transverse processes at the level of the tip of the scapula (T6), lateral movement until the transverse process is visible, and oblique movement until the transverse process, and the pleura are visualized in one image. The block was performed after skin infiltration with lidocaine 2% (3 ml). A needle is inserted in-plane from the lateral side. A bolus of 20 ml of levobupicaine 0,375% is injected through the needle. During administration of the local anaesthetic, a downward movement displacement of the pleura was observed. Then, a catheter (19G Flex Tip Plus®, Arrow) is inserted. A thoracic x-ray made during the postoperative allows to locate the catheter.
Results: Table 1. Values are mean (range), mean $\pm$ SD or absolute numbers. Demographic data

Age (yr)	**66 (22–79)**	
Sex (M/F)	89/16	
Weight (kg)	75 $\pm$ 14	
Height (cm)		
BMI (kg/m^2)	166 $\pm$ 8	27,5 $\pm$ 4,6
ASA I/II/III /IV	(n) 2/35/67/1	Thoracotomy (R/L) 64/41

Appropriate ultrasound identification of the transverse processes, and pleura was possible in all cases. Correct placement of the needle in the paravertebral space resulted in successful PVB and provided adequate intraoperative anaesthesia in all cases and adequate postoperative analgesia in all but three cases (EVA?5). Measurements taken with the thoracic x-ray show that the 77% of the blocks were made with the expected level T6–T7(minT3–maxT8). The catheter direction was either craneal (23%), caudal (50,6%), other (26,4%).

The catheteŕs average lenght in the paravertebral space was 31,68 mm (DE+/- 12.39). The only complications found were: not progress of catheter (1,9%), bloody tap (0,95%), pleural puncture (1,9%) and accidental removal of the catheter (1,9%).

Conclusions: Using this new method US-guided for the continuos PVB may potentially make this procedure safer, more effective and precise.

References

1 Marhofer P, Kettner SC, Hajbok L, Dubsky P, Fleischmann E. Lateral ultrasound-guided paravertebral blockade: an anatomical-based description of a new technique. *British Journal of Anaesthesia* **105** (4): 526–32 (2010).

2 Hara K, Sakura S, Nomura T, *et al.* Ultrasound guided thoracic paravertebral block in breast surgery. *Anaesthesia* 2009; **64**(2):223

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Ultrasound-guided continuos paravertebral block in thoracotomy

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Introduction: General anesthesia associated with thoracic epidural analgesia is the gold standard in the management of open chest surgery. In recent years, provides that the continuous paravertebral analgesia is a technique that achieves a similar pain control to epidural analgesia with greater hemodynamic stability that would determine a lower incidence of complications.

Objectives. The aim of this study was to evaluate the effectiveness and safe to a novel technique of an ultrasound-guided continuous paravertebral block in posterolateral thoracotomy

Methods: 105 patients were included in the study, which consecutively underwent a posterolateral thoracotomy. The patient is positioned in prone position. A high-frequency ultrasound probe is used to scan the thoracic vertebral area in order to locate the transverse processes at the T6 level. With the probe oblique to the spine, a needle is inserted in-plane from the lateral side. A bolus of 20 ml of levobupicaine 0,375% is injected through the needle. Then, a catheter (19G Flex Tip Plus®, Arrow) is inserted. Postoperative analgesia was provided by the continuous infusion of 0.125% bupivacaine+ fentanyl 3 mcg/ml at of 0,1 mL/kg/h. All patients received dexketoprophen 50 mg i.v. and paracetamol 1g i.v. every 8 h.

Results: Patient characteristics are listed in Table 1.

Preoperative spirometric tests

The PVB provided adequate intraoperative anaesthesia in all cases (no intraoperative opioids) and adequate postoperative analgesia (Table 2) in all but three cases (VAS ?5).

The only complications found were: not progress of catheter (1,9%), bloody tap (0,95%), pleural puncture (1,9%) and accidental removal of the catheter (1,9%).

Table 1. Values are mean (range), mean ± SD or absolute numbers. Demographic data

Age (yr)	**66 (22–79)**	
Sex (M/F)	89/16	
Weight (kg)	75 ± 14	
Height (cm)		
BMI (kg/m^2)	166 ± 8	27,5 ± 4,6
ASA I/II/III /IV	(n) 2/35/67/1	Thoracotomy (R/L) 64/41

FEV1 (% of predicted value)	80 ± 22
FVC (% of predicted value)	85 ± 20
FEV1/FVC (%)	71 ± 11
FEV1/FVC,70% (n)	41

Table 2.

Visual Analogue	**Pain score (VAS)**	**(0–100)**
VAS pain rest	24 h	postoperative 8 ± 13
VAS pain rest	48 h	postoperative 5 ± 13
VAS pain rest	72 h	postoperative 4 ± 19
VAS pain On movement	24 h	postoperative 35 ± 23
VAS pain On movement	48 h	postoperative 28 ± 21
VAS pain On movement	72 h	postoperative 15 ± 14

Conclusions: This new method US-guided for the continuos PVB is a precise, effective and safe technique in thoracotomies.

References

1 Joshi GP, Bonnet F, Shah R, *et al.*. A systematic review of randomized trials evaluating regional techniques for postthoracotomy analgesia. *Anesthesia Analgesia* 2008; **107**: 1026–40.

2 Marhofer P, Kettner SC, Hajbok L, Dubsky P Fleischmann E. Lateral ultrasound-guided paravertebral blockade: an anatomical-based description of a new technique. *British Journal of Anaesthesia* **105** (4): 526–32 (2010).

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Ultrasound-guided single-injection paravertebral block in radiofrequency ablation of lung tumours

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Introduction: Radiofrequency ablation (RFA) of lung tumours is a curative technique that is newly considered being offered to nonsurgical patients. However, some patients have previous serious respiratory failure, thus ruling out mechanical ventilation. There are different opinions regarding the type of anesthetic technique of the patients during therapy, and some groups prefer general anaesthesia, while others advocate analgo-sedation o epidural anaesthesia. The paravertebral block (PVB) for analgesia produces an unilateral somatic and sympathetic nerve block, by blocking the efferent spinal nerves; widely used in thoracic surgery.
Objectives. To present our experience in the use of ultrasound-guided single injection paravertebral block technique in RFA of lung tumours.
Methods: Four patients were treated, which consecutively underwent a radiofrequency ablation of lung tumours. Patients were premedicated with 2 mg of midazolam®. Monitoring included ECG, pulse oximetry, and non-invasive arterial pressure. The patient is positioned in prone position. A high-frequency ultrasound probe is used to scan the thoracic vertebral area in order to locate the spinous and transverse processes at the level of the tumour, lateral movement until the transverse process and the pleura are visualized in one image. The block was performed after skin infiltration with lidocaine 2% (3 ml). A needle is inserted in-plane from the lateral side. A bolus of 20 ml of lidocaine 2% is injected through the needle. During administration of the local anaesthetic, a downward movement displacement of the pleura was observed.
Results: All patients were male, ASA III, with a mean age 77 ± 3 years and BMI 25 ± 3. The size of the lesions was 18.8 ± 5.9 mm and were located a left lower lobe, one in the right middle lobe and the two remaining right upper lobe.

In all cases the RF could be performed without incident, under no circumstances will target any episode of hemodynamic instability or desaturation (SpO2 ? 95%). All patients were discharged within 24 hours after RF, previously underwent a CT scan to rule out postoperative complications. There were no readmissions. Conclusions: The ultrasound-guided single injection PVB is a safe technique and could offer an answer to the problem of the patient who requires RFA but has poor lung function.

References

1 Hoffmann RT, Jakobs TF, Lubienski A, Schrader A, Trumm C, Reiser MF, Helmberger TK. Percutaneous radiofrequency ablation of pulmonary tumors—Is there a difference between treatment under general anaesthesia and under conscious sedation?. *European Journal of Radiology* **59** (2006) 168–174.

2 Marhofer P, Kettner SC, Hajbok L, Dubsky P, Fleischmann E. Lateral ultrasound-guided paravertebral blockade: an anatomical-based description of a new technique. *British Journal of Anaesthesia* **105** (4): 526–32 (2010).

Paper No: 909.00

Analgesic Effect of Preoperative Administration of a Single-dose Gabapentin in Acute Postoperative Pain

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Introduction: The research involved a prospective, randomized, double-blind study to investigate the efficacy of preoperative administration of a single dose of gabapentin in acute postoperative pain and in analgesic consumption.
Objectives. The aim of this study was to evaluate the efficacy of preoperative administration of a single dose of oral gabapentin (600 mg) to reduce postoperative pain and analgesic consumption.

Patients and methods. The study included 50 female patients (ASA I and II) undergoing abdominal hysterectomy under general anesthesia. Patients were randomized in two groups: Group I received oral gabapentin (600 mg) one hour before surgery, and Group II received placebo (folic acid 1 mg). All patients received diclofenac (1 mg/kg) as preanesthetic medication, and a continuous diclofenac infusion (2 blisters in 24 hours) as post-operative analgesia. It was indicated to administer Nubain (10 mg) subcutaneously as rescue treatment. The parameters to evaluate were postoperative pain using Verbal numerical scale at 0, 1 and 3 hours, the need for Nubain as rescue treatment, and the time until the administration of the first rescue treatment.
Results: The results associated with a probability below 0.05 were considered statistically significant. The median of the Verbal numerical scale was significantly lower in the gabapentin group vs. placebo group (hour 0 $P=0.011$, hour 1 and 3 $P<0.001$).The need of a rescue treatment with Nubain was also significantly lower within the gabapentin group ($P < 0.001$). In addition, patients who received the rescue treatment within the placebo group did it earlier than those who received gabapentin ($P < 0.001$).
Conclusion: Preoperative administration of a single dose of gabapentin (600 mg) one hour before surgery reduces postoperative pain and opioid consumption in patients undergoing abdominal hysterectomy without adverse effects.

References

1 Christopher L. Wu: Dolor agudo postoperatorio. *Miller anestesia sexta edición. Pag 2729*, 2005.

2 Carr DB, Goudas LC: Acute pain Med **26**:61, 2001.

3 Basbaum AI: Spinal mechanism of acute and persistant pain. *Reg Anesth Pain Med* **24**:59, 1999.

4 Perkins FM, Kehlet H: Chronic pain as an outcome of surgery. *Anesthesiology* **93**:1123, 2000.

5 Dra. Erica Bernich: La Gabapentina y derivados; su papel en la anestesiología y algología. Revista Argentina de anestesiología, volumen 67, número 3,2010.

6 Kissin I: Preemptive analgesia. *Anesthesiology* **93**:1138, 2000.

7 American Society of Anesthesiologist: Practice guidelines for acute pain magement in the perioperative setting. *Anestesiology* **82**: 1071, 1995.
8 Dolin SJ, Cashman JN. Tolerability of acute postoperative pain manegement: nausea, vomiting, sedation, pruritis, and urinary retention. *Br J. Anaesth.* 2005; **95**: 584–91.

Paper No: 911.00

Effect of single dose pre-incisional epidural Ketamine on postoperative pain scores in patients undergoing major upper abdominal surgery: a dose response study

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Introduction: Regional anaesthetic techniques with ketamine as an adjuvant are used to achieve analgesia and reduce the consumption of opioids post operatively. We discuss the outcome following epidural ketamine (preservative free) in combination with morphine in upper abdominal surgery.
Methods: After ethical committee approval, 60 patients who were undergoing upper abdominal surgery in a tertiary care hospital were included in this prospective randomised double blinded study. They were divided into 4 groups of 15 each; group 1(G1) received 3mg morphine alone and group 2 (G2), 3 (G3) and 4 (G4) received morphine with ketamine 0 .25. 0.5 and 0.75 mg/Kg body weight through the lumbar epidural catheter about 20 minutes before the induction of general anaesthesia. All patients received a standardised intravenous opioid based induction and maintained with Oxygen and Isoflurane. Post operatively, a morphine patient controlled analgesia (PCA) was used for the initial 24 hours. An investigator collected the pain scores at regular intervals post operatively and also recorded the morphine consumption rates. Statistical analysis was done (ANOVA), using SPSS package.
Results: Demographic data were comparable. Visual Analog Scale (VAS) scores were recorded at rest, cough and movement at 1, 2, 6, 10, 18 and 24 hours post-operatively. There was statistically significant difference in VAS scores at rest, cough and movement in all ketamine groups compared to morphine only group. VAS score during movement at 2 hours in G1 was 77.33+13.34 compared to 49.29+18.59** (G2), 52.33+16.13*** (G3) and 43.85+11.93*** (G4). VAS score at 10 hours during movement in G1 was 58.67+13.56 compared to 37.14+12.05*** (G2), 46.67+11.59* (G3) and 37.50+10.69*** (G4). VAS score at 24 hours during movement in G1 was 49.33+10.33 compared to 37.86+12.52 (G2), 32.67+11.15 (G3) and 38.57+17.03 (G4). The total post-operative PCA morphine consumption (mg) was 34.60+ 9.840 (Group 1), 25.59+ 9.135* (Group 2), 23.40+8.927** (Group 3) and 20.25+9.01*** (Group 4). None of the patients had any complications related to epidural ketamine post operatively. (Mean+SD, $p<0.05$*, $p<0.01$**, $p<0.001$***).
Discussion: Ketamine in combination with morphine epidurally is an effective adjuvant to achieve adequate post- operative analgesia. The post- operative morphine sparing effect is seen with doses more than 0.5mg/kg body weight. Preservative free ketamine is not freely available for use in regional anaesthesia.

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Infusion of Low dose Vasopressin reduces the incidence of Hypotension following Spinal Anaesthesia

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Introduction: Hypotension following Spinal anaesthesia is endogenously compensated by rennin-angiotensin, vasopressin and endothelin system for a short duration only. Absence of sustained availability of endogenous vasopressin during spinal anaesthesia leads to hypotension. Continuous vasopressin infusion can be beneficial to counter the hypotension caused by spinal anaesthesia without increasing the cardiac activity.
Objectives. The main objective was to study the efficacy of low dose vasopressin infusion(2U/Hour) for prevention of hypotension following spinal anaesthesia.
Methods: In this RCT, a total of 100 subjects, posted for elective lower limb and lower abdominal surgeries were allocated randomly to vasopressin group(V) and control group(C). Considering the incidence of hypotension during spinal anaesthesia to be 33%, keeping the power of study 95% with confidence intervals of 99%, a sample size required is 19 subjects in each group. Following Spinal Anaesthesia, vasopressin infusion was started @ 2units/hour in V group, whereas group C received intravenous saline at same rate. Hypotension was defined as a 25% decrease in MAP from the baseline. Rescue intravenous boluses of Mephentermine were given if the patient developed hypotension.
Results: The incidence of hypotension was 33% in V group compared to 65% in C group ($p<0.02$). The V group had a minimal reduction in MAP compared with C group ($p<0.036$). The total dose of rescue Mephentermine required was more ($p<0.04$) in C group compared to V group(7.24mg vs 3.72).
Discussion: Arginine vasopressin, increases the peripheral vascular resistance leading to rise in blood pressure. During hypotension the levels of vasopressin rise from 4pg/ml to

22pg/ml. Infusion of 0.6U/Hr is required to maintain a plasma level of 25–30pg/ml. However, studies indicate that, incidence of hypotension is minimal with an infusion of 2U/Hr of vasopressin.

Conclusion: Infusion of 2U/Hr Vasopressin during spinal anaesthesia effectively counteracts hypotension caused by sympathetic blockade.

References

1 Carp H, Vadhera R, Garvey D, Jayaram A. Endogenous vasopressin and renin angiotensin system supports blood pressure after epidural block in humans. *Anesthesiology* 1994; **80**;1000–1007

2 De Kock M, Latterre PF, Andruetto P, Vanderesson L, Deckrom S. Ornipressin an efficient alternate to counteract hypotension during spinal / epidural anaesthesia. *Anaesth. Analag.*2000; **90**;1301–7

3 Picker O, Schindler AW, Scheeran TW. Endogenous endothelin and vasopressin support blood pressure during epidural anesthesia in conscious dogs. *Anesth Analg.* 2001; **93**(6): 1580–6

4 Jochberger S, Dunser MW. Arginine vasopressin as a rescue to treat epidural /spinal induced hypotension. *Clinical Anesthesiology* 2008; **22**(2);383;91

Paper No: 935.00

Long-term Outcome after Total Knee Arthroplasty Local Infiltration Analgesia (LIA) vs. Epidural Analgesia

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Introduction: The new technique of high volume local infiltration analgesia in total knee arthroplasty (TKA) has been shown to be superior to both epidural analgesia (EDA) and peripheral nerve blocks in the early postoperative period, 2. However, little data has been published regarding the long-term functional outcome after TKA when local infiltration analgesia has been used.

Objectives. The main goal of this study was to examine the long-term effects of different methods of perioperative analgesia on functional outcome after TKA.

Methods: 102 patients undergoing unilateral TKA were randomized to receive either epidural analgesia (EDA-group) or local infiltration analgesia (ropivacaine 150 mg, epinephrine 0.5 mg) combined with ketorolac 30 mg and morphine 5 mg, given either locally (LIA-group) or IV (LIAiv-group). The Knee Injury and Osteoarthritis Outcome Score (KOOS) was used preoperatively and at 3 months and 12 months after surgery. The KOOS is a validated patient administered score and includes five separately scored subscales: Pain, other symptoms, activity function in daily living (ADL), function in sport and recreation, knee-related quality of life (QoL). Each subscale ranges from 0–100 (100 is optimal score, no symptoms or full function). For tests of differences between the KOOS time-points, paired-samples t-tests were used. For tests of group differences at each time-point, one-way ANOVA tests were used.

Results: A total of 89 patients completed the KOOS at all three time-points (87 percent). The postoperative KOOS increased significantly in all subscales compared with the preoperative score at 3 and 12 months after surgery. There were no differences between the three treatment groups at any time-point. (The study results will be shown as a figure in the poster presentation.)

Discussion: Local infiltration analgesia (LIA) in TKA reduces early postoperative pain and accelerates patient rehabilitation when compared to epidural analgesia1. Essving et al. followed their TKA patients for 3 months and could not find any differences between the group who got perioperative LIA injections and the placebo group3. Our study confirms these results. To our knowledge, this is the first study evaluating functional outcome after 3 and 12 month in TKA patients who were treated with LIA.

Conclusions: In patients undergoing total knee arthroplasty the KOOS was significantly increased at three and at 12 month after surgery representing improved functional outcome. The perioperative analgesic treatment, i.e. local infiltration analgesia or epidural analgesia, did not have any significant influence on the functional outcome as measured with our test battery.

References

1 Spreng UJ, Dahl V, Hjall A, Fagerland MW, Raeder J. High-volume local infiltration analgesia combined with intravenous or local ketorolac+morphine compared with epidural analgesia after total knee arthroplasty. *Br J Anaesth* 2010; **105**: 675–82.

2 Toftdahl K, Nikolajsen L, Haraldsted V, Madsen F, Tonnesen EK, Soballe K. Comparison of peri- and intraarticular analgesia with femoral nerve block after total knee arthroplasty: A randomized clinical trial. *Acta Orthop* 2007; **78**: 172–79.

3 Essving P, Axelsson K, Kjellberg J, Wallgren O, Gupta A, Lundin A. Reduced morphine consumption and pain intensity with local infiltration analgesia (LIA) following total knee arthroplasty. *Acta Orthopaedica* 2010; **81**: 354–60.

Paper No: 956.00

Intravenous regional anaesthesia (IVRA) for the arm with "double tourniquet technique" in orthopedic surgery - five years experience (2006–2011) in two hospitals

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Introduction: This method of regional anaesthesia first described by Bier in 1908 (Bier's block) and repopularised by Holmes in 1963. August Bier, Prof.of Surgery at Berlin,described an unussual method of producing analgesia of a limb.He exsanguinated the arm or leg by means of a tourniquet,and injected a local anaesthetic solution into a vein.
Objectives. The goal of this study was to compare standard technique (one tourniquet) and double tourniquet technique.
Methods: IVRA is indicated for any surgical procedure on the arm below the elbow that will be completed within 45–60 minutes.The only equipment necessary to perfom this procedure successfully is a tourniquet that can be inflated to a pressure above the patient's systolic blood pressure and a cannula inserted a distal vein.Drug of choice is xylocain 0,5% volume 40 ml for the arm.After exsanguination on the arm below the elbow,tourniquet can be inflated and local anaesthetio slowly injected.Analgesia will occur within 10 minutes and surgery can then commence.Early end of procedure or tourniquet release is risk too,because serious side effects may occur-movement of local anaesthetic into the central circulation and potential for toxic reactions.It is good practice to place a cannula in another arm.
Results: 96 adult patients (age 15–74,ASA I-II) scheduled for hand surgery were randomly divided into two groups.The control group received 0,5% xylocain of total 40 ml and tourniquet was inflated to a pressure at least 100 mmHg above systolic blood pressure.second group (double tourniquet) received 0,75% xylocain of total 40 ml and tourniquet was inflated to a pressure at least 150 mmHg above patient's systolic blood pressure.Sensory and motor block onset and recovery times and anaesthesia quality were noted.Before and after the tourniquet application at 5,15,30,45 and 60 min heart rate,mean blood pressure,saturation,tourniquet pain and sedation were noted,too.Intraoperatively all patients received midazolam.Minor side effects have been reported in 18% of cases in control group, and 11% in second group.
Conclusions: If the operation is prolonged,the patient may complain of pain due to pressure from the tourniquet. With "double tourniquet technique" and higher concentration of xylocain (0,75%) and inflated tourniquet to a higher pressure (150 mmHg abobe patient's systolic blood pressure,we prolongated surgery until 75–90 minutes.This is adventage too,when the patient becomes uncomfortable-the distal tourniquet is inflated and then proximal one is deflated.

Paper No: 965.00

Evaluation of parecoxib compared to parecoxib plus dypirone on postoperatory analgesia of videolaparoscopic cholecystectomy

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Introduction: Parecoxib is a potent analgesic COX-2 inhibitor used to control acute pain. Dipyrone is a potent nonopioid painkiller used to treat acute and chronic pain. Both drugs are used to control postoperative pain mild, moderate or severe.
Objectives. To assess the analgesic efficacy of parecoxib associated with dipyrone, parecoxib and placebo, within 6 hours of the postoperative period of laparoscopic cholecystectomy.
Methods: After approval by the Institutional Research Committee, 60 patients, physical status P1 or P2, age 18 to 60 years, scheduled to videolaparoscopic cholecystectomy surgeries, were included. They were submitted to general anesthesia (propofol, alfentanil, rocuronium and isoflurano) and were randomly distributed into 3 groups: Group 1 – 40mg of parecoxib plus 2g of dipyrone in 20ml of saline at the anesthetic induction, Group 2 – 40mg of parecoxib in 20ml of saline at the anesthetic induction, Group 3 – 20ml of saline at the anesthetic induction. In the postanesthetic recovery room patients were evaluated at the first complaint of pain using visual analog scale and verbal pain scale every hour during the first 6 hours. If necessary was applied morphine as rescue analgesic medication using patient controlled analgesia.
Results: No difference was identified in age among the three groups. The average values of the required dose of morphine for pain relief were 5.5 mg in the parecoxib group, 3.9 mg in the parecoxib+dipyrone group and 12.9 mg in the control group. Comparing the two groups regarding the consumption of morphine, it appears that the control group required higher doses of morphine when compared to parecoxib group ($p < 0.002$), and when compared to parecoxib+dipyrone ($p < 0.002$). Parecoxib+dipyrone group required lower doses of morphine, compared to parecoxib group ($p < 0.002$). Comparing the 3 groups regarding severity of pain assessed by visual analogue scale and verbal rating scale showed higher pain intensity in the control group when compared to parecoxib, and when compared to parecoxib+dipyrone at all times when pain intensity was assessed.
Conclusions: The results were quite satisfactory, since parecoxib+dipyrone group had lower levels of pain intensity and reduced consumption of rescue morphine. It may have been a bias in the study, because the surgeries evaluated in this study did not show great potential painful, but also parecoxib and the association parecoxib+dipyrone were effective in controlling postoperative pain.

Reference

1 Puolakka PA, *et al.* Lack of analgesic effect of parecoxib following laparoscopic cholecystectomy. *Acta Anaesthesiol Scand.* 2006; **50**: 1027–32.

Paper No: 972.00

Social media networking and regional anesthesia. The gear & laig group experience

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Introduction: Facebook is a free social network service and media website with more than 750 millons users (1). Allows people all over the world to create their own profile, add users as friends, comunicate and mainly share information, links, photos and videos, make comments, create notes, participate in forum discussions and other alternatives like promoting their or others activities.
Objectives. Present our experience with the GEAR and LAIG scientific facebook pages.
Material and Methods: In 2008, we created the first spanish language scientific facebook page of Regional Anesthesia (2), in order to promote, diffuse and update our Regional Anesthesia knowledge, experience and to encourage other colleagues to participate and share their information . We named it as GEAR (Grupo de Estudio de la Anestesia regional Argentina) and in 2010 we created the LAIG (Latin American Interest Group in Ultrasound for Regional Anesthesia and Pain Medicine (3), page dedicated to Ultrasonoraphy in Regional Anesthesia and Pain Medicine in english languaje.
Results: GEAR Page had more than 1200 "fans" from more than 20 countries, 50% from Argentina. 68% between 25 and 44y. More than 65.000 views of the page publications. 76 Videos published in youTube and linked with the page, more than 600 photos, also clinical cases
Discussions: comments, Forum discussions with more than 60 different subjects. First Refresher Course of regional Anesthesia sponsored by de AAARBA with 40 lectures 12 minutes and innovation of self postulation. Relation with other International societies, Centres for observers, Participation in international meetings (Rome, Turkey, USA, Chile), links LAIG started in 2010, had more than 800 users, 50% from Brazil and Argentina and the other 50% from more than 20 different countries. More than 21.000 views of the page.
Conclusions: The GEAR and LAIG facebook pages are excellent tools to share information, participation, difussion, promotion and networking, encourage colleagues to create and share their material with generosity. Effort and dedication is needed to maintain interest and network comunication.

References

1 Clay Shirkly, Here comes everybody. *Penguin Books*. 2008
2 http://www.facebook.com/pages/GEAR-GRUPO-DE-ESTUDIO-DE-LA-ANESTESIA-REGIONAL-ARGENTINA/481522785176
3 http://www.facebook.com/pages/Ultrasound-for-Regional-Anesthesia-and-Pain-Medicine-LAIG/142881255757580

Paper No: 974.00

Successful epidural anaesthesia with conscious sedation for a 14h15min lower limb orthoplastic procedure involving free gracilis flap

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Introduction: Benefits of central neuraxial anaesthesia are recognised in reconstructive lower limb surgery 1–5. However, due to unpredictably long duration of orthoplastic procedures involving free gracilis flaps (FGFs), epidural anaesthesia (EA) is traditionally combined with general anaesthesia (GA). In our experience4,5, GA and its side-effects can be avoided for this type surgery. We now present a successful case of a 14hr15min procedure performed under EA and sedation(EA+Sed).
Methods and Results: A 50 year-old, ASA 1 male presented for excision of osteomyelitis, external fixator, FGF and split skin grafting, following an old tibial fracture which had required multiple operations under GA. Informed consent was obtained for EA+Sed. An epidural catheter was inserted at L3/4 interspace. 20 mls of 0.5% bupivacaine resulted in a block adequate for surgery. EA was maintained with an infusion of 0.1% bupivacaine+ fentanyl 2mcg/ml at a rate of 8mls/hr, supplemented by four boluses of 5 mls 0.5% bupivacaine during the complex microvascular stage of the operation.

Conscious sedation was maintained with target-controlled infusion of 1% propofol with added ketamine (2mg/ml); total doses were 1250mg and 200mg respectively. Increments of midazolam up to a total of 3.5mg, and 50mcg fentanyl were also given. Oxygen at 2–4L/min was administered via a Hudson mask.

In addition to standard monitoring, invasive blood pressure, urine output, serial arterial blood gases were also measured. The patient tolerated the procedure very well, with no respiratory, haemodynamic or metabolic problems. There was no need for vasopressors and blood transfusion. Importantly, the patient's upper limbs were repositioned several times at his request, to avoid positional injury. On admission to the High Dependency Unit for overnight monitoring, he was fully alert, pain free and drinking shortly afterwards. On postoperative follow-up, the patient rated his recovery from the EA as "quicker", compared to previous GAs and described EA a "better experience all the way through and after". The only recalled intraoperative discomfort was a

dry mouth. Feedback from surgeons and recovery nurses was also very positive. The patient made a full recovery.
Conclusions: To our knowledge, this is the longest reported successful FGF surgery under EA+Sed, suggesting that prolonged duration of surgery per se does not preclude central neuraxial anaesthesia without GA. Not without its challenges, this technique offers significant advantages from free flap physiology and patients' mental and physical recovery perspectives. We advocate it as the technique of choice for orthoplastic lower limb surgery in carefully selected patients.

References

1 Strecker WB, Wood MB, Wedel DJ. Epidural anesthesia during lower extremity free tissue transfer. *J Reconstr Microsurg*. 1988; **4**: 327–9.
2 Weber S, Bennett CR, Jones NF. Improvement in Blood Flow During Lower Extremity Microsurgical Free Tissue Transfer Associated with Epidural Anesthesia. *Anesthesia and Analgesia* 1988; **67**: 703–5
3 Alam NH, Haeney JA, Platt AJ. Three episodes of gracilis free muscle transfer under epidural anaesthesia. *J Plast Reconstr Aesthet Surg*. 2006; **59**: 1463–6
4 Bayshev F, Rutter S. Prolonged epidural anaesthesia for complex flap surgery. *Reg Anesth and Pain Med*. 2007; **5**; S1: 39
5 Giele H, Critchley P, Galitzine S, Nagarajah K, Stubbs D, McNally M. Lower limb microsurgical reconstruction under regional anaesthesia: 21 cases. *BAPRAS (British Association of Plastic, Reconstructive and Aesthetic Surgeons) Summer* 2011: 39–40

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Finger index – new useful clinical index in safety forecast orbital regional anesthesia

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Introduction: This index, recently described, determines the safety degree for extraconal or intraconal blockades do not have an epidemic study in general population.
Objectives. Study the epidemiology in this index in Brazilian population.
Methods: Ambulatory patients attended in São Paulo Hospital – UNIFESP, for cataract removal during 2008 September and October, were classified by gender, age, ethnicity and Finger Index (FI) in both eyes. This index is done inserting the forefinger upwards in the space between inferior-lateral portion of the orbital rim and the globe. The incursion of the finger determines the scale: 3 Finger penetrates easily and goes over the equator of the eye. 2 Finger penetrates easily but does not reach equator. 1 Just the tip of the finger penetrates the orbit 0 Finger does not penetrate the orbit at all (rare - 1:2000).
Results: From a total of 738 patients, 432 (58.5%) were female. Mean age was 69.7 ± 9.5 years (range: 40–92), with no relevant differences between genders. Distribution by ethnicity was: whites (60.3%), mixed (29.1%), blacks (7.2%) and asians (3.4%). Finger Index (FI) distribution in the population was: 3 (40%), 2 (56%), 1 (4%) and 0 (0.1%), Finger Index and sex. FI 3 was more frequent in males than in females (44.8 vs 35.8%), while FI 2 was the contrary (51.0 vs 60.2%). FI 3 frequency tended to increase with age while FI 2 and 1 tended to decrease.Finger Index and ethnicity. FI 3 was more frequent in blacks and less frequent in asians while FI 2 was the contrary. Whites and mixed presented more commonly FI 2.
Conclusions: A Finger Index 3 may be seen as an indirect measure of a wide orbit, either due to fat atrophy in old age or gender/racial features, and a FI 1 or 0 as a "tight" orbit, while FI 2 is the standard. A higher FI was more frequently found in men, older subjects and blacks, suggesting this group as the "safest" for periocular blocks. On the other hand, women, young subjects and asians could be regarded as higher risk groups, with a good indication of sub-Tenon or topical anesthesia. Other studies are needed to better evaluate these correlations in clinical practice and thus, establish FI as a useful index for predicting the safety of extraconal or intraconal blockades.

Reference

1 Kallio H; Rosenberg PH - Advances in ophthalmic regional anaesthesia. *Best Pract Res Clin Anaesthesiol*;**19**(2): 215–27, 2005 Jun.

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Extraconal block anesthesia for cataract surgery extraction with implantation of intraocular lens: Difference of Bupivacaine and Ropivacaine in the anesthesia quality

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Introduction: Bupivacaine is local anesthetics (LA) of larger versatility, but cardiotoxic justified the development from other anesthetic location of long duration, less toxic LA. Arising a Ropivacaine, a pure isomer, there are evidences that cardiovascular and SNC toxicity have threshold elevated.
Objectives. Evaluation of the difference anesthesia quality produced by Bupivacaine and Ropivacaine in extracone blockade for cataract surgery extraction with implantation of intraocular lens.
Methods: 482 patients were randomly distributed into two groups: Bupivacaine 0,75% and Ropivacaine 0,75%; applying superior extraconal blockade. The quality of the block was evaluated as follows: number of blocks needed for akinesis, evolution of akinesis in Nicoll index, associations for the palpebrae superioris and orbicularis oculi (eyelids)

muscles; intraoperative pain (at the puncture, local anesthetic injection, instrumentation of eye) and postoperative pain; total akinesis, analgesia, comfort and collaboration of the patients evaluated by the surgeon; adverse intra and postoperative events. When the akinesis and analgesia failed, it was opted for other blockades for complementation.

Results: Motor blockade was completed up to 10 minutes. No difference was observed between the groups regarding the number of complementary blockades. Initial puncture was the most intense nociceptive stimulation throughout the procedure and postoperative period. When the agreement and disagreement between puncture pain and anesthetic solution injection was compared, agreement was obtained in the ropivacaine group and disagreement in both groups that reflected lower intensity of injection pain. From the surgeon's perspective aknesis, comfort and collaboration of the patients during the operation was similar in both groups. There was also no difference of intra and postoperative complications between the groups.

Conclusions: Bupivacaine and Ropivacaine 0,75% produce similar akinesis and analgesia. Injection of Ropivacaine is associated of more intense pain than that of Bupivacaine.

References

1 Tetzlaff JE. Bupivacaine. In: Tetzlaff JE. *Clinical pharmacology of local anesthetics*. Boston: Butterworth-Heinemann; 2000a. p.115–23.

2 Gielen M. Do we need new long acting local anaesthetics? *Acta Anaesthesiol Belg*. 2000; **51**(2): 109–11.

3 MacClellan KJ, Faulds D. Ropivacaine: an update of its use in regional anaesthesia. *Drugs*. 2000; **60**(5): 1065–93.

Paper No: 988.00

Acute pain management for neck of femur fractures: a comparison of the fascia iliaca block versus traditional opiates

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Introduction: Patients who sustain a fractured neck of femur experience severe preoperative pain that, if improperly managed, may cause considerable morbidity and interfere with postoperative recovery(1). Conventional management of this pain involves administration of strong opioid analgesics which have known side effects such as hypoxia, sedation, nausea, vomiting and risk of inadequate pain relief. The present study investigates an alternative therapy, the fascia iliaca compartment block, as an equally effective form of analgesia without the aforementioned side effects.

Objectives. The preoperative treatment outcomes for fractured neck of femur patients who had been given either conventional opioid management or the alternative iliaca compartment block were compared within a regional setting in New South Wales, Australia.

Methods: Patients admitted to Coffs Harbour Base Hospital and Port Macquarie Base Hospital between June 2011 and September 2011 with a fractured neck of femur were included in the study (n=33). 14 patients at Coffs Harbour and 2 patients at Port Macquarie received conventional opioid analgesia while 17 patients at Port Macquarie received a fascia iliaca compartment block.

Anaesthetists performed the 'two-pop' fascia iliaca blockade as originally described by Dalens et.al.(2) A 20ml bolus dose of 0.2% Ropivacaine was injected and a continuous infusion of 10ml/hour commenced.

Pain scores were taken prior to analgesia, at 1, 4 and either 24 hours after initial analgesic or immediately prior to surgery; whichever came first. The total dose of analgesic, presence or absence of sedation, nausea and vomiting requiring antiemesis, and respiratory effects such as oxygen saturation, respiratory rate and oxygen requirements were also recorded.

Results: As at September 1 2011, 8 males and 25 females were enrolled in the study. The mean age was 82 years. Age and proportion of males and females were similar at both sites. No patient in either group became increasingly sedated. At each observed time point following analgesia the number of patients receiving oxygen was higher in the opioid group (14, 16 and 13 compared to 12, 11 and 11). The incidence of nausea and vomiting was also higher in the opioid group (57% of patients compared to 0%). According to pain scores both therapies were similarly efficacious. Data collection and analysis will be finalised in November 2011.

Conclusions: Preliminary results suggest that, when correctly performed, the fascia iliaca compartment block is as effective as conventional opioids at managing preoperative hip fracture pain but with fewer side effects and improved patient experience.

References

1 Roberts HC, Eastwood H. (1994). Pain and its control in patients with fractures of the femoral neck while awaiting surgery. *Injury*, **25**(4), 237–239.

2 Dalens B, Vanneuville G, Tanguy A. (1989). Comparison of the Fascia Iliaca Compartment Block with the 3?in?1 Block in Children. *Anesthesia & Analgesia*, **69**(6), 705–713.

Paper No: 996.00

Epidural Catheter Technique vs. Transversus Abdominis Plane (TAP) Catheter Technique for Postoperative Analgesia after Abdominal Surgery; a Randomized Controlled Study

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Introduction: Although TAP block has been shown to be effective (1) no studies have been published on comparing continuous infusion of Transversus abdominis plane (TAP) vs Epidural. Niraj etal recently published similar trial (2) that compared Epidural to TAP by giving intermittent bolus doses.
Objective: The aim of this study was to compare continuous Epidural Catheter Technique vs TAP Catheter Technique for Abdominal Surgery in regards to technical difficulty, analgesic efficacy, and patient satisfaction.

Method. Ethical committee approval obtained for randomised control trial for 40 patients after written informed consent undergoing elective major abdominal surgery for year 2010–2011; the epidural group (n=20) receiving preoperative epidural catheter and TAP group (n=20) receiving Tap block with catheter post procedure. Epidural group received 8–15ml of 0.2% ropivacaine of bolus dose. TAP group received ropivacaine bolus of 0.375% 20ml each side followed by 0.2%ropivacaine infusion to run at 8ml/hr each side. Both groups received acetaminophen and patient controlled analgesia (PCA) with fentanyl for 3 days. The following parameters were registered: " Numerical Rating Scores for Pain (NRS-P; 0–10) at rest and on coughing in PACU at 0 and I hour and in the postoperative ward at 24 hrs, 48 hrs, and 72 hrs. " Fentanyl use in PACU and postoperative ward on day 1, day 2, and day 3. " Procedure related: Technical issues, duration of introduction of catheter(s), Potential side effects or complications in relation to the technique used and any rescue medication used. Also a 4 point 'Likert'-scale was be used on day 3 and during a follow-up telephone call at one month to assess patient satisfaction with the analgesic technique used.
Results: There were 19 in epidural and 20 in TAP group as one patient in epidural was excluded as it was not possible to insert. There was no difference between the gender and age technique. Using Wilcoxon rank-sum (Mann Whitney) test; pain scores over time in both the groups in recovery, day 1–3 at rest and on coughing, there was no difference. Similar results were noted for Likert satisfaction scores. The total fentanyl requirement in Epidural and Tap group by using Two sample t test with equal variance was SEM 2916.83 ± 370.51td (CI 2135.125-3698.541) and 2882.857 ± 396.906 (CI 2054.926-3710.789) respectively.
Conclusion: The TAP group and Epidural have achieved similar pain scores and rescue analgesia fentanyl used was also similar. TAP block may be considered as alternative analgesic technique but more randomised trials are needed.

References

1 *Anesth Analg* 2007; **104**: 193–97.
2 *Anaesthesia* 2011; **66**: 465–71.

Paper No: 1025.0

Effect of the association of magnesium and ketamine on morphine consumption in scoliosis surgery

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Introduction: Scoliosis is a major orthopedic surgery associated with severe postoperative pain, leading to complications if not properly treated. The need for effective pain control involving multimodal analgesia is well established[1]. Among others, the NMDA receptor antagonists as ketamine and magnesium were extensively studied and proven separately effective morphine-sparing agents[2–4].
Objectives. The purpose of this study is to evaluate the additive effect of both magnesium and ketamine on morphine consumption during and after scoliosis surgery.
Methods: After ethic committee approval and written consent, 50 patients scheduled for scoliosis repair, were randomized in a prospective double-blind study. The Gr(K+Mg) (25 patients): received after induction a bolus of ketamine 0.2mg/kg and magnesium 50mg/kg over 30min followed by continuous infusion of ketamine 0.15mg/kg/h until extubation and magnesium 8mg/kg/h to one hour after extubation. The Gr(K) (25 patients): received the same dose of ketamine associated with a bolus and continuous infusion of normal saline. All patients received standardized general anesthesia (propofol, remifentanil, sevoflurane, N2O and rocuronium) and a multimodal analgesia (paracetamol, ketoprofen) with a patient controlled analgesia (PCA) of morphine. Pain scores VAS (rest, movement, cough), morphine consumption and occurrence of side effects were noted until 48 hours postoperatively. Intraoperative muscle relaxant needs, sleep quality and patient satisfaction were also noted. $p < 0.05$ was considered statistically significant.
Results: The demographic and surgical characteristics were similar between the two groups. Remifentanil consumption was identical: Gr(K+Mg) 1836.2 vs Gr(K) 1952.6 ìg. The average cumulative morphine consumption was significantly lower in the Gr(K+Mg) compared to the Gr(K) at H4, H8, H12, H18, H30 and H36. About 35% of postoperative morphine-sparing was noted in the Gr(K+Mg) (54.09 vs 73.35 mg). The dose of rocuronium tended to be lower in the Gr(K+Mg) (72.6 vs 90.2 mg; p=0.079). VAS scores and side effects were statistically comparable in the two groups. Quality of sleep and satisfaction scores on the first night were significantly higher in the Gr(K+Mg) (p=0.018; p=0.014 respectively).
Conclusion: The adjunction of magnesium to ketamine in bolus and continuous perfusion during scoliosis surgery

decreases significantly postoperative morphine requirements, despite identical VAS scores in the 2 study groups. It doesn't bring advantages on intraoperative remifentanil consumption, however, procures a better quality of sleep and satisfaction at the first night. Therefore, intraoperative addition of magnesium to ketamine in general anesthesia with remifentanil appears to be safe and effective for multimodal control of postoperative pain.

References

1 Borgeat A, *et al.*, *Curr Opin Anaesthesiol*, 2008. **21**(3): p. 313–6.
2 McCartney CJ, *et al.*, *Anesth Analg*, 2004. **98**(5): p. 1385–400.
3 Levaux C, *et al.*, *Anaesthesia*, 2003. **58**(2): p. 131–5.
4 Liu HT, *et al.*, *Anesth Analg*, 2001. **92**(5): p. 1173–81.

Paper No: 1031.0

Patient controlled thoracic epidural analgesia enables better pain control and less postoperative ileus and pulmonary complications after gastrectomy, compared with intrathecal morphine plus intravenous patient controlled analgesia

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Background: Patient-controlled epidural analgesia is widely used because of its excellent pain relieving effect even with small amount of opioids. ? However, for patients undergoing gastrectomy, it must be done via thoracic epidural space which is known to be most difficult and also consumes a lot of time, causes discomfort and many side effects by the catheter itself. ? Meanwhile, intrathecal morphine and IV-fentanyl patient controlled analgesia has been proved to provide effective pain relief for patients undergoing many types of surgery ? Above all, intrathecal injection is easy and has less complication because it is usually done via L3–4 or L4–5. ? There is no study yet comparing the analgesic effect between patient-controlled thoracic epidural analgesia (PCEA) and intrathecal morphine+IV patient-controlled analgesia with fentanyl (ITM-IVPCA) for patients undergoing gastrectomy.
Objectives. Therefore, the aim of this study is to compare the analgesic effect and side effects between these two methods.
Methods: ? Materials ? 60 patients(>20yrs,ASA I/II) undergoing gastrectomy due to gastric cancer were included and randomly allocated into ITM-IVPCA (IT group) or PCEA group(EP group) ? Methods ? IT group: Intrathecal administration of morphine 0.3mg at L3/4 level before induction. IV PCA (fentanyl 20§¶/kg, 5 mL/hr, blous 0.5mL, LOT; 15 min) and ramosetron 0.3mg IV during peritoneal closure. ? EP group: Epidural catheter insertion at T8/9 or T9/10 level and administration of 0.2% ropivacaine 5ml through epidural cathter before induction. PCEA(0.2% ropivacaine 250mL+ fentanyl 20§¶/kg 5 mL/hr, bolus 0.5mL, LOT; 15 min) and ramosetron 0.3mg IV during peritoneal closure. ? Assessments Subjective discomfort during procedure, procedure time, pain score until 48hrs after surgery (NRS) and adverse effects (nausea and vomiting, pruritus, sedation). Postoperative complications within POD 30.
Results: ? There are no difference in analgesic effect between the IT group and the EP group except postop 1 HR. However, the 95% confidence interval of the median treatment differences regarding NRS scores at rest on the first postoperative day failed to demonstrate non-inferiority of the ITM-IVPCA. ? The procedure for Intrathecal injection takes shorter time and makes patients more comfortable compared to that for epidural catheter insertion. ? The IT group shows more nausea and sedation, but there are no significant differences in vomiting, pruritus and headache between the two groups. ? Time to ambulation is shorter in EP group ? Within POD 30, the incidences of postoperative ileus, pulmonary atelectasis or effusion, hepatic dysfunction were lower in EP group than IT group.
Conclusion: In patients undergoing gastrectomy, intrathecal morphine+IV patient-controlled analgesia with fentanyl is not as effective as patient-controlled thoracic epidural analgesia with respect to pain control, postoperative complications.

Paper No: 1032.0

Lornoxicam delivered by PCA is effective and safe for postoperative pain control in lumbar spine surgery

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Introduction: Lornoxicam (L) is a NSAID which exerts its anti-inflammatory and analgesic properties by inhibition of cycloxigenase-2. Effective pain relief after spine surgery is a fundamental part of perioperative care, and has been shown to increase patient comfort, allowing early ambulation and minimizing postoperative complications. Effectiveness of patient controlled analgesia (PCA) following spine surgery has been well established. However, studies investigating effectiveness and safety of L delivered by PCA either intravenously (IV) or pararadicularly (PR) have not been carried out. In the present study we evaluated effectiveness of PCA in the patients which underwent lumbar discectomy.

Materials and methods: 45 patients undergoing elective lumbar discectomy were randomly asigned preoperatively into one of the treatment groups: 1) 8 mg as boluses every 8 hours. 2) IV L administered via a PCA pump set as: loading dose 2 mg, bolus dose 2 mg, lockout interval 30 min, continuous infusion 0.01 mg/kg/h. 3) PR L administered via PCA pump, through a 18-gauge multiple-orifice epidural catheter (introduced at the end of surgery by the surgeon) set with following parameters: loading dose 2 mg, bolus 1 mg, lockout interval 30 min, continuous infusion 0.01 mg/kg/h. All patients were anesthetized with a single-shot epidural injection of 0.75% ropivacaine 2 mg/kg. Blood was sampled for determination of cortisol levels before the surgery, and 4, 24 and 48 hours post-op. Pain was assessed by a blinded observer using the visual analog score (VAS). The total amount of L administered for adequate pain control was calculated at 24 and 48 hours post-surgery.
Results: Groups had similar baseline parameters. Length of the surgery was approximately 75 min with no significant differences between treatment groups. The Total amount of L administered during first 24 hours was significantly lower in PR PCA group (16.8 ± 1.2 mg) compared to IV PCA (21 ± 3.7mg) and IV bolus (21 ± 3.8 mg) groups ($p<0.05$). The total amount of L administered during the next 24 post-operative hours was significantly lower in PR PCA group (2.3 ± 2.2mg) compared to IV PCA (11 ± 4.5mg) and IV bolus ($12. \pm 4.6$mg) groups ($p<0.0001$). Plasma cortisol levels were lower in both IV PCA and PR PCA groups compared to IV bolus group at 4, 24 and 48 h after the surgery. VAS was not significantly different between treatment groups at all time points. No infectious or neurological complications related to placement of periradicular catheter were seen in PR PCA group. No toxic effects related to L treatment were noted in any treatment group.
Discussion: Postoperative pain relief is an important part of the perioperative treatment. In the present study we evaluated effectiveness of L for pain control in patients undergoing spine surgery. L is an effective postoperative analgesic in this type of spine surgery. The decrease in serum cortisol is more pronounced when L is delivered by PR/IV PCA, and the total amount of drug needed for adequate analgesia is lower in this group.
Conclusion: Delivery of L by IV or PR PCA has been shown to be an effective and safe method for pain control after lumbar spine surgery.

Paper No: 1040.0

Spinal versus general anaesthesia: a comparison of complications, patient satisfaction and cost of anaesthesia

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Introduction: General anaesthesia (GA) with intermittent positive pressure ventilation is considered the standard anaesthetic technique for conducting laparoscopic cholecystectomy (LC). Applications of neuraxial techniques for laparoscopic surgeries are not new, especially in higher risk patients. Nevertheless, there are sparse studies on comparison of spinal anaesthesia (SA) and GA while performing LC.
Objectives. This study aimed at comparing complications, patient satisfaction and overall anaesthetic cost of LC when performed under either SA or GA.
Methods: Two hundred ASA physical status I and II patients undergoing LC were randomized into two groups. SA group ($n=100$) received 3 ml of 0.5% heavy bupivacaine admixed with fentanyl (25 mcg) and pethidine (25 mg) intrathecally to obtain a sensory blockade up to T5. GA group ($n=100$) underwent standard endotracheal general anaesthesia with intermittent positive pressure ventilation. Preanaesthetic preparations and all other surgical or anaesthetic managements were standardized. Surgery was performed with a low-pressure pneumoperitoneum (10 mm Hg) and a minimal operating table tilting. Before surgical dissection 30 ml of 0.25 % bupivacaine was instilled into the right subdiaphragmatic space and over the gall bladder. Intraoperative events, complications, postoperative pain (visual analog scale scores at 2, 4, 8, 12 and 24 hours), 24 hours parenteral opioid consumption, patients' satisfaction towards anaesthetic technique (on a 10 points scale) and an overall anaesthetic cost were studied.
Results: There were no differences between the groups regarding complications, intraoperative need for vasoactive medications, duration of hospital stay and degree of patient satisfaction. Pain scores at 2, 4, 8, 12, and 24 hours and consumption of parenteral opioids over 24 hours were significantly lesser in the SA group ($p<.05$). The overall cost of anaesthesia in the SA group was significantly lower ($p<.05$).
Discussion: Our study has confirmed the feasibility of performing elective laparoscopic cholecystectomy with low pressure CO2 pneumoperitoneum and minimal operating table tilt under sole spinal anaesthesia. Additionally, spinal anaesthesia provides minimal intraoperative haemodynamic perturbations and is valuable in postoperative pain control, patient satisfaction and lowering the cost of anaesthesia. However, this approach requires a co-operative patient, an experienced laparoscopist, and an enthusiastic anaesthesiologist ever prepared to supplement it with intravenous adjuncts.
Conclusions: Spinal anaesthesia is tolerable and safe for performing elective laparoscopic cholecystectomy in otherwise healthy patients. Compared to GA, spinal anaesthesia proffers better control of postoperative pain, lesser postoperative opioid consumption and a lower overall cost of anaesthesia.

References

1 Soper NJ, Stockman PT, Dunnegan DL, *et al.* Laparoscopic cholecystectomy: the new "gold standard"? *Arch Surg.* 1992; **127**: 917–21.

2 Pursnani KG, Bazza Y, Calleja M, *et al.* Laparoscopic cholecystectomy under epidural anesthesia in patients with chronic respiratory disease. *Surg Endosc*. 1998; **12**(8): 1082–4.
3 Luchetti M, Palomba R, Sica G, *et al.* Effectiveness and safety of combined epidural and general anesthesia for laparoscopic surgery. *Reg Anesth*. 1996; **21**(5): 465–9.
4 Hamad MA, Ibrahim El-Khattary OA. Laparoscopic cholecystectomy under spinal anesthesia with nitrous oxide pneumoperitoneum: a feasibility study. *Surg Endosc*. 2003; **17**(9): 1426–8.
5 van Zundert AAJ, Stultiens G, Jakimowicz JJ, *et al.* Laparoscopic cholecystectomy under segmental thoracic spinal anaesthesia: a feasibility study. *Br J Anaesth*. 2007; **98**: 682–6.
6 Tzovaras G, Fafoulakis F, Pratsas K, *et al.* Spinal vs general anesthesia for laparoscopic cholecystectomy. *Arch Surg*. 2008; **143**(5): 497–501.
7 Joris JL, Noirot DP, Legrand MJ, Jacquet NJ, *et al.* Hemodynamic changes during laparoscopic cholecystectomy. *Anesth Analg*. 1993; **76**: 1067–71.

Paper No: 1042.0

A comparison between infraclavicular brachial plexus block and humeral approach: effectiveness, anesthesia time, analgesia duration and complications

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Introduction: prospective randomized study between infraclavicular and humeral approaches for brachial plexus block.
Objectives. compare the effectiveness, performance time, onset time, anesthesia time (performance+onset time), analgesia duration, patients comfort and complications.
Methods: we randomized 130 ASA physical status I and II patients to 2 equal groups: infraclavicular (IC) and humeral block (HB). Blocks were performed using neurostimulator. For the HB block, four motor responses (median, ulnar, musculocutaneous and radial) were located while for IC block we searched one distal response (radial, preferably, or median nerve). We injected 40 ml of bupivacaine 0,25% and lidocaine 1% with epinephrine 1:400000 when the motor response occurred between 0,3 and 0,5 mA, at 2Hz and 0,1 miliseconds. We considered nerve block failure when sensory blockade was not complete after 30 minutes. We evaluated patients comfort during performance of the anesthetic procedure with a scale from 1 (bad) and 5 (excellent).
Results: the effectiveness was 93,8% for IC and 95,4% for HB (p=0,5). The performance time was of 4:20 ± 2:40 for IC and of 6:34 ± 2:27 minutes for HB (p=0,000002). The onset time was of 19:26 ± 6:09 minutes for IC and of 18:55 ± 6:14 minutes for HB (p=0,64). The anesthesia time was of 23:55 ± 6:20 minutes for IC and of 25:29 ± 6 minutes for HB (p=0,12). The analgesia duration was similar in both groups: 10:54 ± 3:26 hours for IC and 10:26 ± 2:50 hours for HB (p=0,43). The analgesia for bone surgery was of 10:36 ± 3:25 hours for IC and hours for IC and of 9:53 ± 2:34 hours for HB (p=0, 14). For soft tissue surgery the analgesia duration was of 11:11 ± 3:27 hours for IC and of 11:20 ± 3:06 hours for HB (p=0,62). A high degree of satisfaction (score 4 or 5) was recorded in 100% of IC (mean of 4.94 ± 0.24) and in 98.5% of HB (mean of 4.86 ± 0.39) (p=0.18). No significant complications were observed.
Conclusions. Both approaches have high effectiveness, with a significantly shorter performance time in IC group but with similar anesthesia time, providing a high degree of satisfaction and a prolonged duration of analgesia without complications. Therefore, we conclude that either infraclavicular or humeral blocks are great options for upper extremity surgery not being allowed to say that one of these approaches is superior than the other.

References

1 Wilson J, Brown D. Infraclavicular brachial plexus block: parasagittal anatomy important to the coracoid technique. *Anest. Analg*. 1998; **87**: 870–3.
2 Dupré LJ. Bloc des branches du plexus brachial au canal huméral. *Ann Fr Anesth Reanim* 1992; **11S**: R42.
3 Minville V, Amathieu R. Infraclavicular Brachial Plexus Block Versus Humeral Approach: Comparison of Anesthetic Time and Efficacy. *Anesth Analg* 2005; **101**: 1198 –201.
4 Frizelle H, Moriaty D. The midhumeral approach to the brachial plexus. *Anest Analg* 1998; **86**: 445–51.
5 Gross C, Astore F. Bloqueos de los nervios terminales del plexo braquial en el canal humeral (bloqueo mediohumeral). *Rev. Arg. Anest*. 2004; **62**: 445–452.
6 Cuvillon P, Dion N. Comparision of 3 intensities of stimulation threshold for brachial plexus blocks at the midhumeral level. *Reg. anesthesia and Pain Medicine* 2009; **34**: 296–300
7 Sia S, Lepri A. Four injection brachial plexus block using peripheral nerve stimulator: a comparison between axillary and humeral approach. *Anest. Analg*. 2002; **95**: 1075–9.
8 Moayeri N, Renes S. Vertical infraclavicular brachial plexus block: needle redirection after elicitation of elbow flexion. *Reg. anesthesia and Pain Medicine* 2009; **34**: 236–241.
9 Bloc S, Garnier T. Spread of injectate associated with radial or median nerve-type motor response during infraclavicular brachial plexus block: an ultrasound evaluation. *Reg Anesthesia and Pain Medicine* 2007; **32**:130.

Paper No: 1047.0

Chris hani baragwanath hospital postoperative analgesic therapy observational survey

Mabhidli Mduduzi Mashinini and A.C. Lundgren

Introduction: A large scale survey conducted in Western Europe, has identified deficiencies in the postoperative pain management. (1) Anecdotal evidence suggests that

postoperative pain (POP) management at Chris Hani Baragwanath Academic Hospital is suboptimal. Surgical wards were identified as areas where the need and the application of institutional programmes may improve the overall quality of pain management.

Objectives. The aim of this survey was to establish current POP management practices, for surgical patients at Chris Hani Baragwanath Hospital, and thereby identify potential areas of improvement.

Methods: The investigation was prospective, cross-sectional, observational survey and the study population comprised doctors responsible for the assessment and management of POP in adult patients. A standardised multiple choice questionnaire adapted from a survey conducted in European hospitals was used to collect data anonymously. (1)Data analysis was done using Statistica 8.0(T). Answers provided were compared to the minimum acceptable requirement as defined by the Steering Committee of the European Postoperative Analgesic Therapy Observational Study.

Results: The response rate was 70% and 92% of respondents were surgeons. For 98% there was no organization, or a specific budget provided. For 56% there was no onsite training provided to the personnel. According to 37%, patients were not informed preoperatively on POP management, and for 44% preoperative information was provided to patients only in specific situations. Balanced analgesia was used by 41% for major surgery. 56% declared that patients were treated on regular basis in ward and, 44% only when the patient was complaining of pain. For 78% there were no written protocols in place. Pain was not assessed by 40%, and 39% assessed only if patient complained of pain.

Conclusion: The results from this survey highlight deficits that exist in the management of postoperative pain, despite the availability of sophisticated systems of drug delivery in the hospital. The inadequacies are universal encompassing all aspects of postoperative pain management. Major contributors are financial constraints, low level of expectations with regards to adequate pain relief, lack of commitment in the full utilisation of the available resources and skills. Improvement in the quality of POP management will require 1) re- education of attitudes with emphasis on greater awareness of the importance of management of POP. 3) Active involvement by the anaesthetists in reorganising the pain services. 4) Optimal utilization of the existing resources and skills by developing simple procedure specific treatment protocols and flow charts for common procedures.

Bibliography

1 Dan Benhamou, Marco Berti, Gehard Brodner, Jose De Andes, Gaetano Draisci, Mariano Moreno -Azeoita, Edmund AM, Neugebaurer Wolfgang Schwenk, LuisMiguel Torres, Eric Viel. Postoperative Analgesic Therapy Observational Survey (PATHOS): A practice pattern study in 7 central/Southern European countries. *Pain* **136** (2008) p134 – 141

Paper No: 1066.0

Comparison of fentanyl and fentanyl with dexmedetomidine for postoperative pain relief by intravenous patient controlled analgesia: a preliminary study

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Introduction: Dexmedetomidine, a highly selective alpha-2 adrenoreceptor agonist has been observed to possess sedative and opioid sparing effects. This study was conducted to assess whether dexmedetomidine added to intravenous patient controlled analgesia (PCA) with fentanyl could improve postoperative analgesia with a subsequent reduction in opioid requirement and the related side effects of this alpha agonist.

Objective: To assess whether dexmedetomidine added to intravenous patient controlled analgesia (PCA) with fentanyl could improve postoperative analgesia with a subsequent reduction in opioid requirement and the related side effects of this alpha agonist.

Methods: In a prospective, randomized, double blinded study, 40 patients undergoing lower abdominal hysterectomy were allocated to two groups postoperatively Group I received analgesia via intravenous PCA solution which contained fentanyl 5 microgram per ml, while in Group 2, the PCA solution contained fentanyl 5 microgram per ml plus dexmedetomidine 5 microgram per ml. The PCA pump was programmed to deliver 1 ml per demand with a 5mins lockout interval and no background infusion. Cumulative requirement of fentanyl, pain intensity, cardiovascular and respiratory variables and PCA related adverse events were compared and analysed.

Results: Compared with group-1, Patients in group-2 required 40% less fentanyl and significantly lower pain levels were

reported in this set of patients when compared to patients in group 1 during first 24 hrs postoperative. The level of sedation was more in group-2, however, there was no associated respiratory depression. There was no incidence of nausea, bradycardia, or hypotension in group-2.

Conclusion: The addition of dexmedetomidine to intravenous PCA fentanyl resulted in superior analgesia, significant fentanyl sparing, less fentanyl induced side-effects and was devoid of untoward hemodynamic changes.

References

1 Lubenow TR, Ivankovich AD, Barkin RL. Management of Acute Postoperative Pain. In: Barash Paul G, Cullen Bruce F., Stoelting Robert K (eds). Clinical Anesthesia, 5th Edition. *Lippincott Williams & Wilkins* 2006; Chapter 55: 1406–1441

2 Lin TF, Yeh YC, Lin FS, *et al.* Effect of combining dexmedetomidine and morphine for intravenous patient-controlled analgesia. *Br J Anaesth* 2009; **102**: 117–22.

3 Kehlet H, Dahl JB. The value of "multimodal" or "balanced analgesia" in postoperative pain treatment. *Anesth Analg* 1993; **77**: 1048–1056.

4 Gorocs TS, Lambert M, Rinne T, *et al.* Efficacy and tolerability of ready-to-use intravenous paracetamol solution as monotherapy or as an adjunct analgesic therapy for postoperative pain in patients underoing elective ambulatory surgery: open, prospective study. *Int J Clin Pract* 2009; **63**: 112–120.

5 Klimek M, Lacroix MM. The safety and effectiveness of dexmedetomidine when used for more than 24 hours in an adult intensive care setting. *J Pharmacy Practice* 2007; **20**: 474–77.

6 Munise Y, Aybars T, Sema T, *et al.* Effect of dexmedetomidine on haemodynamic responses to laryngoscopy and intubation: perioperative haemodynamics and anaesthetic requirements. *Drugs RD* 2006; **7**: 43–52.

Paper No: 1068.0

Weaning of high dose opioids in trauma patients is inadequate

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Introduction: Opioid prescribing in Australia continues to increase with a particularly sharp rise in the use of low dose (<20mg) oxycodone from 2003 (1). Good pain control in the setting of trauma patients improves long-term outcomes, reduces hospital stay and can reduce the incidence of post traumatic stress disorder (2). Opioid use, however, remains controversial as they have both short and long term adverse effects, including psychological and physical dependence.

Objectives. To evaluate the prescription of strong opioids in trauma patients presenting to a level one trauma centre.

Methods: The medical records of sixty patients were reviewed retrospectively from the Acute Pain Service (APS) and the Traumanet databases (using 'minor' trauma as defined by the trauma registry) over a three months and one month period respectively. Fisher's exact and Wilcoxon rank sum were applied using Stata Corp 11.0, USA.

Results: Summarised below. Values are number (%), mean (SD) or median (IQR).

APS Data (n=30)	Minor Trauma (n=30)	P -value	Age
50.2 (20.1)	66.2 (21.0)	<0.01	
Male	20 (67%)	16 (53%)	0.43
Length of stay 9.5 (7–15)	9 (5–13)	<0.01	
Trauma Score (ISS) 18(14–26)	5 (4–9)	<0.001	
ICU/HDU admissions 17 (57%)	3 (10%)	<0.001	
Surgery required 17 (57%)	13 (43%)	0.44	
Pain score (verbal 0–10)			
Highest	9 (7-10)	8 (5-10)	0.23
Lowest	0 (0-0)	0 (0-0)	0.14
Last	1.5 (0-5)	0 (0-3)	0.15
Analgesia			
Strong opioids (all types & routes)			
	30 (100%)	26 (87%)	0.11
Parenteral opioids (excluding PCA)			
13 (43%)	16 (53%)	0.61	
PCA 21 (70%)	4 (13%)	<0.001	
Max oral oxycodone <40mg/day	16 (53%)	29 (97%)	
}<0.001	?40mg/day	14 (47%) 1 (3) }	
Tramadol 21 (70%)	10 (33%)	<0.01	
NSAIDs 25 (83%)	11 (37%)	<0.001	
Paracetamol 30 (100%)	28 (93%)	0.49	
Antineuropathic 11 (37%)	4 (13%)	0.07	
Ketamine 16 (53%)	4 (13%)	<0.01	
Discharge oxycodone <40mg/day	24 (80%)	30 (100%)	
}0.02	?40mg/day 6	(20%) 0 }	
Weaning emphasized on discharge >40mg/day	3 (50%)	>80mg/day 0	

Discussion: The APS group reviewed patients with higher trauma scores, more critical care admission and longer inpatient stay. Interestingly, the rate of surgery and the pain scores between the two groups were similar. More importantly, the last documented pain scores for both groups were low.

Oxycodone is the strong opioid of choice at our institution. The majority (93%) of patients received oxycodone during

their admission and over half (57%) were discharged with this medication. Patients in the APS group were more likely to receive non-opioid (multimodal) analgesia, be prescribed a PCA and then be rotated to high doses of oral oxycodone. One fifth of these patients were discharged on high dose oxycodone. Weaning of this medication, however, was only emphasized in half of these patients. Of concern, there were two patients discharged receiving >80mg oxycodone per day with no weaning plan in place.

Conclusion: Opioid weaning needs to be emphasized during the hospital admission and those receiving high doses should be discharged with a letter to the family physician outlining a weaning regime. This will reduce the incidence of opioid misuse/abuse and reduce the risk of acute pain progressing to chronic pain.

References

1 Leong M, *et al.* Examination of opioid prescribing in Australia from 1992 to 2007. *Int Med J* 2009; **39**: 676–681.

2 Cohen S, *et al.* Pain management in trauma patients. *Am J Phys Med Rehab* 2004; **83**(2): 142–61.

Paper No: 1073.0

Management of post operative pain at the National Hospital of Niamey, Niger

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Introduction: The management of post operative pain has been a serious problem to anesthesiologists. In developed countries post operative pain was readily controlled by using of analgesic drugs, loco regional anesthesia and particularly the newly implemented concept of multimodal analgesia .In the developing countries, the difficulty in accuracy; the non accessibility of these drugs and the miss management of post operative patients were rendering this pain control difficult.

Objectives. To evaluate the management of post operative pain at the National Hospital of Niamey.

Methods: A descriptive and prospective study was conducted with a total of 553 operated patients; all were above six years old, it was from 12 March, to 12 June, 2009 at the surgical department of the National Hospital of Niamey. The investigation concerned the type of anesthesia and surgery; the kind of analgesic used alone or in association. Three type scales were used, one for each patient; based on his better understanding to evaluate the pain: verbal rating scale (VRS), numerical rating scale (NRS) or visual analog scale (VAS) at 12hours; 24 and 48 hours after surgery.

Results: The mean age of the patients was 39 years; the male represents 53.2 % and female 46.8 %. Sixteen patients (2.89 %) received an analgesic treatment before the surgery, 83.72% were classed ASA1. The orthopedic and pelvic surgeries were the most realized in 30.20 % and 30%. 50.63 % benefited of general anesthesia; 48.28% spinal anesthesia and 1.08% plexus bloc. The VRS was be used at 72% of patients; NRS at 14.40 % and VAS at 13.60 %.

In 75 patients evaluated by VAS; 29.30 % have the scale under 7 at 12 hours; 5.40 % and 0 % at 24 and 48 hours after surgery respectively. For the category of NRS; 33.80 %; 8.80 % and 2.50% respectively at 12 hours, 24 and 48 hours after surgery. The VRS evaluation 33.90 %; 8.3 % and 2.10% have the scale at 3 to 4 at the 12; 24 and 48 hours respectively. 236 patients (42.67 %) received one analgesic; 308 (55.69 %) associations of two analgesics and nine patients (1.62 %) received triple association. The adverse effects were nausea and vomiting in 197 patients (35.62 %).

Conclusion: Post operative pain is however miss managed in devellopping countries; an urgent solution is to be taken to standardize this management.

References

1 American Society of Anesthesiologists: Practice guidelines for acute pain management in the perioperative setting: A report by the American Society of Anesthesiologists Task Force on Pain Management, Acute Pain Section. *Anesthesiology* 2004 Jun; **100**(6): 1573–81.

2 Chauvin M. l'analgésie multimodale. In : *Conférence d'actualisation de la SFAR : les Essentiels* 2005, Elsevier, p. 295–308.

3 Aubrun F, Paqueron X, Langeron O, Coriat P, Riou B: What pain scales do nurses use in the postanaesthesia care unit? *Eur J Anaesthesiol* 2003; **20**: 745–9.

Paper No: 1080.0

Post operative analgesia in knee arthoscopy :a comparative study of intra-articular nalbuphine and buprenorphine

Usha Padhye, Sujit Saraf, Minal Upasani, Arun Joshi and Anant Deshpande

Introduction: Surgical trauma causes pain which is an unpleasant sensory and emotional experience. Pain is taken as a vital sign by american pain society. Opioids can produce potent antinociceptive effects by interacting with local opioid receptors in inflammed peripheral tissue. Morphine have been shown to markedly inhibit acute post operative pain when injected intra-articularly after arthoscopic knee surgery. We have tried to evaluate effects of new opioids which have minimal side effects.

Objective: To compare effect of intra-articular nalbuphine and buprenorphine for post operative analgesia for knee arthroscopy

Methods: In double blind randomized trial, we have studied 500 patients in 3 groups. Subarachnoid block was given to all patients in l3–l4 interspace in sitting position with 25 g quincke's needle with 2ml; 0.5 bupivacaine. Routine monitoring was instituted. Intraarticular injection of respective drugs was administered after completion of surgery according to following groups.

(1) group S-(control group)-20ml normal saline (2) group n-10mg(1ml)of nalbuphine+19ml of normal saline (3) group b-100mcg buprenorphine+19ml of normal saline

Post operative pain was assessed with visual analogue scale after regression of block by 2 segements with interval of 1,3,6,12,24 hours post operatively.

Results: Group S patients required rescue analgesia at 2 hours post operatively. group b required rescue analgesia after 12 hours while group n patients did not require any rescue analgesia till 24 hours post operatively. some patients of group b had nausea, vomiting and itching while group n patients did not have any side effects.

Conclusion: Intraarticular nalbuphine compared to buprenorphine significantly reduces pain after knee arthoscopy through an action on specific local opioid receptor without any side effects.

References

1 Intra articular bupivacaine plus Nalbuphine analgesics for chronic joint pain; *N Engl J Med* 1991; **325**: 1123–6

2 Analgesic effect of intra articulr Morphine after arthroscopic knee surgery. *N Engl J Med* 1991; **325**: 1123–1126 OCTOBER 17, 1991

3 Rolley E Johnson, Paul J Fudala, Richard Payne. Buprenorphine: considerations for pain management. *Journal of pain and symptom management* 2005.

Paper No: 1102.0

Analgesic Effectiveness of Nerve Block in Shoulder Arthroscopy: Comparison with Interscalene, Suprascapular and Axillary Nerve Block

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Introduction: In arthroscopic shoulder surgery, postoperative shoulder pain is one of the most severe problems that cannot be easily controlled in patients. Interscalene blocks (ISB) have been demonstrated to be one of the most effective treatment modality which is used during arthroscopic shoulder surgery. Suprascapular nerve and axillary nerve block (SSNB and ANB) was used more frequently and also more than 90% of total shoulder pain can be easily controlled with SSNB and ANB.

Objectives. We compared postoperative VAS scores and patient satisfaction in three groups: the group in which PCA (patient controlled analgesia) only was used (PCA only-group), the group in which PCA was used following ISB (PCA with ISB-group), and the group in which PCA was used following SSNB and ANB (PCA with SSNB+ANB-group). We examined whether decreased PCA usage following these blocks could lead to the decreased occurrence of nausea and vomiting.

Methods: Among patients who underwent arthroscopic rotator cuff repair, 61 patients (26 men and 35 women) were prospective nonrandomly allocated: group 1 (PCA only-group, n=17); group 2 (PCA with ISB-group, n=26); and group 3 (PCA with SSNB+ANB-group, n=18). VAS(visual analogue scale) score, satisfaction, PCA(patient controlled analgesia) usage, and the incidence of nausea and vomiting were measured 4 times post-operatively (in the recovery room and 8, 16, and 24 hours post-op).

Results: VAS scores in a recovery room were the highest in PCA only-group and were significantly lower in PCA with ISB-group and PCA with SSNB+ANB-group. VAS score comparisons were group 2>group 1>group 3 at postoperative 16 hours. In a recovery room, the patient¡s satisfaction was higher in group 2, but no significant differences were seen at the other times. The total PCA usage was greater in group 1 than that in groups 2 and 3 until 8 hours. Also, no significant association between the 3 groups in the incidence of nausea and vomiting was observed at all time points.

Conclusions. PCA with ISB and PCA with SSNB+ANB were all effective for early-stage pain control. In PCA with ISB-group, VAS score at recovery room is most decreased but increased more and more at the follow up periods. PCA with SSNB+ANB would be better anesthetic methods than PCA with ISB between postoperative 8–24 hours.

References

1 Al-Kaisy A, McGuire G, Chan VW, Bruin G, Peng P, Miniaci A, Perlas A (1998) Analgesic effect of interscalene block using low-dose bupivacaine for outpatient arthroscopic shoulder surgery. *Reg Anesth Pain Med* **23**: 469–473

2 Boss AP, Maurer T, Seiler S, Aeschbach A, Hintermann B, Strebel S (2004) Continuous subacromial bupivacaine infusion for postoperative analgesia after open acromioplasty and rotator cuff repair: preliminary results. *J Shoulder Elbow Surg* **13**: 630–634

3 Checcucci G, Allegra A, Bigazzi P, Gianesello L, Ceruso M, Gritti G (2008) A new technique for regional anesthesia for arthroscopic shoulder surgery based on a suprascapular nerve block and an axillary nerve block: an evaluation of the first results. *Arthroscopy* **24**: 689–696

4 Jerosch J, Saad M, Greig M, Filler T (2008) Suprascapular nerve block as a method of preemptive pain control in shoulder surgery. *Knee Surg Sports Traumatol Arthrosc* **16**: 602–607

5 Singelyn FJ, Lhotel L, Fabre B (2004) Pain relief after arthroscopic shoulder surgery: a comparison of intraarticular analgesia, suprascapular nerve block, and interscalene brachial plexus block. *Anesth Analg* **99**: 589–592, table of contents

Paper No: 1112.0

Comparative study of intrathecal tramadol, fentanyl and buprenorphine for post operative analgesia

Usha Padhye, Sujit Saraf, Abhijay Pawar, Rahul Deshmukh and Arun Joshi

Introduction: Intrathecal administration of opioids is a simple and cheaper option for effective post-operative analgesia that does neither require any special equipment nor does it involve multiple painful pricks to the patient. Hence, we have decided to compare intrathecal administration of buprenorphine, fentanyl and tramadol along with bupivacaine for post-operative analgesia.

Methods: This study was conducted in 1200 ASA-I / II patients (age group 20–60) posted for lower abdominal, urological, gynecological or lower limb surgeries. These patients were divided into 4 groups.

Group p -2 ml of bupivacaine 0.5% heavy+placebo-300 Patients Group T -2 ml of bupivacaine 0.5% heavy+tramadol 25 mg 300 Patients Group F 2 ml of bupivacaine 0.5% heavy+fentanyl 25 mcg 300 Patients Group B 2 ml of bupivacaine 0.5% heavy+buprenorphine 90 mcg 300 Patients Routine monitoring was instituted. in sitting position SAB given in L3–L4 interspaces with Quincke (25 G). At a reading of 3 VAS, rescue analgesia,IM diclofenac .

Results: Duration of sensory and motor blockade was significant in group T, F, B as compare to control group p. requirment of rescue analgesia is minimal in group T, F, B as compre to group P

Comparison of mean time in hours for rescue analgesics:

GROUPS	MEAN TIME	SD	STATISTICAL
Group p	3.04	±0.20	INSIGNIFICANT
Group T	6.88	±0.52	SIGNIFICANT
Group F	6.24	±4.02	SIGNIFICANT
Group B	13.74	±4.02	SIGNIFICANT

Conclusion: Intrathecal administration of buprenorphine, fentanyl and tramadol along with bupivacaine provide excellent pain relief in the post-operative as compared to plain bupivacaine alone. Duration of analgesia with buprenorphine being significantly more than fentanyl or tramadol. Intrathecal administration of opioids with bupivacaine also prolongs the duration of motor block as well as sensory block as compared to bupivacaine only. The incidence of itching was more with fentanyl followed by buprenorphine. And least in tramadol and plain bupivacaine. The incidence of PONV increases with tramadol and buprenorphine.

References

1 Ben David, Soloman E, Levin H, *et al.* Intrathecal Fentanyl with small dose of bupivacaine. *Anaesthesia. analgesia* 1997. **(85)** 562–565

2 Intrathecal buprenorphine for post-operative anlgesia. A prospective. randomized double blind study. *Safiya I Shaikh, Journal of anaesthesiology and clinical Pharmacol.* 2010; **26**(1), 35–38.

3 Intrathecal tramadol added to bupivacaine as spinal anaesthetic increasesanalgesic effect of the spinal blockade after major gynecological surgeries.Sushmita Chakraborty.*Indian Journal of Pharmacology* 2008; **40**:180182.CES:

Paper No: 1133.0

Vaginal Delivery with Spinal Pethidine

Akbar Khamsei

Introduction: Pregnancy and labor are two great, impressive, impacting and important events in the life of women with psycho-socio-medical aspects and a great concern for the comfiest painless normal vaginal delivery.

Objective: to introduce the spinal analgesia with an opioid drug, pethidine, as a safe, prompt, effectual and comforting procedure for a painless normal vaginal delivery.

Materials and methods. 1000 ASA physical status I–II parturients were admitted to labor suite for observation and monitoring until delivery(during 2 years) (2010–2011) (65% nulliparas), aged 15–45 years. Given information all had requested and consented, examined and confirmed by attending Ob- Gy specialist and midwife nurse, in the rapidly progressive active phase of the 1st. stage of labor with cervical os dialation (4–5cm) and effacement(40%-50%), and fetus in normal position and degree of descent. Spinal analgesia with pethidine hydrochloride 10–15 mg with a 9mm small-bore(25-gauge) cutting tip needle at L3–L5 levels in parallel insertion in sitting position,all performed by the author. All parturients received 500–100 ml,I.V. normal saline/ringer solution prior to procedure.

Results: There was no spinal failure, no significant adverse effect/ complication. 4 cases refused. 4cases postpartum very mild respiratory depression. Very mild hemodynamic changes in 5 cases. Post dural puncture mild headache in 3 cases 1%. prolonged labor (99% 10–30 minutes). 1% arrest of descent resulting in cesarean section. 6 cases of twins. No mortality/morbidity. All mothers and newborns discharged 1–2 days after parturition. The onset of pain relief accomplished in 5–12 minutes, diminished in 20–55 minutes.

Discussion: In appropriate doses all opioids produce pain relief depnding on their pharmacokinetics and pharmacodynamics and intrathecally provide no motor block, no adverse effect on uterine contractibility, and in such small doses no adverse fetal/neonatal effects. It should be noticed that the pain in the 1st. stage of labor is due to uterine contractions and dialation of cervix traveling via visceral afferent fibers and podendal nerves and enters the neuraxis.

Conclusion: this antrospective, descriptive, and direct clinical study showed that spinal analgesia with pethedine 10–15mg is a safe, prompt, effectual and comforting procedure/

methode that can provide excellent satisfactory, safe and pleasant analgesia/painless normal vaginal delivery and labor.

Keywords: spinal anesthesia; painless vaginal delivery; pethidine

Paper No: 1156.0

Alternative Approach of the Posterior Tibial Nerve at the Heads of the Gastrocnemius, Using Ultrasound-Guided Blockade and Nerve Stimulation

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Introduction: Our anesthesiology Department uses ankle block in foot and ankle outpatient surgical procedures, because of its little latency, good anesthetic efficacy, post-op analgesia and early discharge. Since ankle blocks cannot be used in patients with hematomas, skin lacerations or scalps at the puncture site, the department developed an alternative approach involving the posterior tibial nerve at the junction of the gastrocnemius.
Objective: Assessing the usefulness and efficacy of a new surgical approach of the posterior tibial nerve, considering latency and post-op analgesia.
Materials & Methods: 103 ASA I to III patients, with ankle or foot scheduled surgical procedures presenting hematomas, swelling and post-trauma skin lesions at the puncture site. A decision is made to use an alternative block at the junction of the gastrocnemius, where the internal sciatic popliteal nerve continues the posterior tibial nerve, under direct ultrasound-guided nerve block and with the use of a nerve stimulator. Patients are given an injection with 10ml volume of 0.5% bupivacaine, single dose. The patient lies in lateral decubitus with the knee slightly flexing, his/her leg on a pillow to reduce movements and pain. It is an ultrasound-guided approach (SonoSite NanoMaxx) with a nerve stimulator and a Stimuplex 50 needle performed out of plane to avoid a painful puncture of the muscular fascia of the gastrocnemius. Anesthetic efficacy, latency and residual analgesia were assessed. The deep peroneal nerve and the superficial peroneal nerve were also blocked at the fibular neck and the saphenous nerve at the greater saphenous vein, under the knee.
Results: Maximum latency was 13 minutes, considering temperature changes and sympathetic blockade of sole of the foot (changes in coloring, redness.) 100 out of 103 patients had their surgical procedure without need of any anesthetic complement, with very good tolerance to pneumatic tourniquet and surgical technique. The remaining 3 patients required some anesthetic complement in the surgical area corresponding to the areas of the foot innervated by the sural nerve. Post-op average analgesia was 17 hours.
Discussion: Our experience shows that this alternative approach under ultrasound combined with nerve stimulation of the posterior tibial nerve at the head of the gastrocnemius was easy to perform, provides acceptable latency and has proven to be very effective for anesthetic purposes and post-op analgesia.

Keywords: Regional anaesthesia; Posterior Tibial Nerve Alternative Approach

Paper No: 1178.0

Ultrasound guided contunious bilateral infraclavicular and epidural catheter usage for pain relief following four extremity amputation

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Introduction: Adult Still disease is a rare rhomatologic disease causing both localized ischemia and systemic complications. Regional blocks can be used in the treatment of pain and providing vasodilation which is critical for improving the nutrition of tissue. CASE REPORT A 18 year old female with Still disease had undergone four extremity amputation secondary to ischemia. The patient referred to our department because of phantom pains. In order to provide pain relief, epidural catheter was placed for lower extremities and ultrasound guided bilateral infraclavicular catheters were placed in order to relief the phantom pain of the upper extremities. After obtaining an informed consent, the patient is placed in lateral decubitis position and epidural catheter was placed at L4–5 space without any complication. The position of the catheter was controlled with a test dose. Following the epidural catheter the patient was placed supine position. Induction was provided with propofol and fentanyl and a 3 No laryngeal mask was placed. The right arm was positioned at 90 degree abduction and prepped and draped. Under ultrasound guidance medial, lateral and posterior cords were identified. With a 10 ml of serum saline injection, a dilatation was obtained at the space of the medial cord. The diffusion of the serum saline was detected with ultrasound and a catheter was placed to the medial cord region. Blockade was performed with 20ml 0,25 % bupivacaine. Same procedure was performed with the left arm. One hour after the induction doses the infusion was began at a rate of 4ml/hour with 0,125 % bupivacaine for the infraclavicular catheters and 1 mg/hour of morphine infusion for the epidural catheter intraoperatively. No complication was observed and the patient was taken to the PACU. The follow-up during the 48 hours period revealed a VAS

score between 2–3 for the four extremities. Same VAS scores was between 0–2 at the 7 days follow-up. No complication secondary to morphine and local anesthetic usage was encountered during the follow-up period.
Conclusion: With epidural/infraclavicular catheter placement, we aimed to reduce the pain related to amputation, increase the blood circulation with sympathetic blockade and ultimately improving patient comfort. For bilateral blockades all cases must be evaluated individually and the physician must be aware of the local anesthetic toxicity.

Paper No: 1182.0

Combined ultrasound and neurostimulation guidance: A prospective randomized comparison as perineural distribution of local anaesthetic as the end point for peripheral nerve blocks

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Introduction: Ultrasound (US) or Neurostimulation (NS) are two common techniques for peripheral nerve blocks (PNB) [1,2]. NS suggests a close needle nerve relationship by eliciting a motor response while US allows a real-time visualization of anatomical structures and LA distribution. Data for combining both techniques are rare and contradictory. Previous studies show a poor conformity between eliciting paresthesia and corresponding motor response [2,3,4].
Objective: The aim of this study was to evaluate the conformity of visualization needle, LA distribution via US and the proper motor response by NS.
Methods: With the approval of the local Ethics committee and informed consent, a total of 160 patients scheduled for elective surgery were included in this prospective, randomized study. In the ultrasound group (n=80) the neural structures were visualized and the needle tip was placed ultrasound guided. Releasing a motor response was assessed (0.1ms, 2Hz) up to 2mA. In the neurostimulation group (n=80) the distribution of LA was visualized and assessed at the needle position where a motor response was elicit at or below 0.5mA. Primary end point was the perineural distribution of LA and appropriate surgical anaesthesia. A motor response to an amperage below 0.5mA and a perineural LA distribution were assessed as a positive conformity of ultrasound and neurostimulation in the two groups. The absence of motor response or a LA maldistribution was assessed as a negative conformity.
Results: We conducted 160 peripheral nerve blocks (32 ISB, 48 axPl, 40 NFB, 40 DIB). There were no demographic differences between the groups. Perineural LA distribution and adequate block quality was achieved in all patients in the US-group and in 66 (83%) in the NS-group. In the US-group 26 patients (32%) had no motor response to 2.0mA. A motor response was shown in 33 patients (41%) to a intensity to 0.5mA. The average amperage for this patients was 0.33 mA ($\pm$0.09). Quality of sonographic visualization was good in 108, normal in 35 and difficult in 17 patients.
Conclusion: Ultrasound guided needle placement and monitoring LA distribution is associated with a high success rate for PNB. The lack of conformity with a proper motor response in combination with neurostimulation may confuse the operator. Using NS as the prior tool for needle placement results in inferior results. Our results suggest our hypothesis, that combining US and NS is not essential for PNB cause of a minor conformity to determinate the correct needle position.

References

1 Ultrasound in Regional Anasthesia. *Anaesthesia* 2010(65):Suppl.
2 Fifteen years of ultrasound guidance in regional anaesthesia. Marhofer P, Anaesth BrJ. 2010; **104**(6): 673–83
3 The Sensitivity of Motor Response to Nerve Stimulation and Paraesthesia for Nerve Localization as evaluated by Ultrasound. Perlas A, *et al.* RAPM 2006; **31**(5): 446–450
4 Neurostimulation in ultrasound-guided infraclavicular blocks: a randomized trial. Dingemans E. *Anaesth Analg* 2007; **104**: 1275–1280

Paper No: 1183.0

Intravenous Patient Controlled Postoperative Analgesia: Does Fentanyl Cause Acute Tolerance?

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Introduction: Intravenous Patient Controlled Analgesia (IV PCA) is a very effective and safe method of postoperative pain relief.1 Morphine and Fentanyl are commonly used. Tolerance to opioids is common with chronic users. However, acute tolerance in the post operative period to morphine or fentanyl is not known. We compared the analgesic efficacy of morphine and fentanyl for post-operative pain management after major surgeries. During this study, we observed that the dose requirement of fentanyl increased beyond 12 hours in the post operative period, probably due to acute tolerance.
Methods: 60 ASA I-III patients aged 18–60 years undergoing major abdominal surgeries, were randomly allocated to receive either morphine (Group M - basal continuous infusion 0.02mg/kg/hr, bolus dose of 0.02mg/kg and lock out period of 20 min) or Fentanyl (Group F - basal continuous infusion 0.5mcg/kg/hr, bolus dose of 0.5mcg/kg and lock out period of 20 min), for Patient controlled Analgesia post operatively. Parameters studied were, Pain assessment by Visual analogue scale score (0–10), Systolic and diastolic blood pressure, Oxygen Saturation, Respiratory rate, Pulse rate,

Cumulative analgesic consumption, Hourly analgesic consumption, sedation and any side effects for each drug. Dose of fentanyl were converted as morphine equivalent doses for comparison. Data was analyzed by using ANOVA, Student's t-test and Chi-square test or Fischer's exact test.

Results: There was no difference between the groups with regard to age, sex, weight, ASA grade, hemodynamic parameters, oxygen saturation, respiratory rate and complications. Pain relief as measured by VAS was significantly better with morphine group, than Fentanyl group (p=0.000). Cumulative equi-analgesic consumption of morphine was consistently lesser compared to morphine equivalent of fentanyl (p=0.000). There was consistently lesser hourly consumption of morphine in 72 hours compared to morphine equivalent of fentanyl (p=0.000). In fentanyl group there was an increase in hourly consumption of fentanyl between 12–48 hours, which was statistically significant (p=0.000). There was higher incidence of nausea and vomiting with morphine than with fentanyl (37% vs 21%) The patient's satisfaction was better with morphine (p=0.000).

Discussion: The study showed increased dose requirement of Fentanyl beyond 12 hours lasting upto 48 hours, to obtain adequate analgesia. This relative increase in dose requirement inspite of good pain relief upto to 12 hours, suggests a possibility of acute tolerance to Fentanyl. Such increase in dose requirement was not seen with morphine. Literature survey to seek an explanation for this observation, we found that in animals, opioid receptor studies have shown that acute tolerance to Fentanyl occurs because of desensitization of mu receptors, due to configurational changes and uncoupling from adenyl cyclase.2 A similar phenomenon is not seen with morphine because tolerance, involving a different mechanism, with adaptational changes at the â -arrestin1 level, and internalization of G-protein-coupled receptors, is seen, only with chronic use.

Conclusion: This study suggests acute tolerance to Fentanyl may occur when used for IV PCA.

References

1 Br. J. Anaesth 2001; 87:34–6.
2 The Journal of Neuroscience 2002; 22:192–200.

Paper No: 1189.0

Mini dose spinal anaesthesia for endovascular aneurysm repair of thoracic aorta

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Introduction: There is increased demand for modification of regional anaesthesia for modern surgical procedures including endovascular surgery of thoracic aortic aneurysm. Minimal invasive surgery gives opportunity to operate old patients with high ASA scoring. In these cases preservation of leg movement is necessary for evaluation of spinal blood perfusion thus avoiding spinal ischemia during graft implementation. Seventeen patients presented for endovascular aortic aneurysm repair, ASA 2, 3, 4, age 33 to 86 years old (mean age 64 years), 13 male, 4 women were given" mini dose spinal anaesthesia". Endovascular graft implantation lasted no longer than 2 hours (mean time - 98 min). In this study mini dose spinal anesthesia with use of mixture of 25mcg of Fentanyl (o,5 ml), 2,5 mg of Heavy Marcaine (0,5 ml) and 0,5 ml of normal saline was used for regional technique necessary for endovascular repair of thoracic aortic aneurysm. Standard anesthetic technique was used except composition of local anaesthetic mixture. Level of analgesia was assessed 5 and 10 minutes after injection. Cardiovascular stability of the patient, level of analgesia, need of additional analgesia and leg movement were assessed during procedure . Level of analgesia was from L2 to Th10 in first 5minutes after injection and from L1 to Th10 after 10 minutes from drug administration. Additional intravenous opioid was necessary in 3 cases for pain relief. Fourteen patients were able to preserve movement during procedure and in recovery room. During all procedures no significant drop of blood pressure was noted . After procedure patients had no pain . It seems that mini dose spinal anaesthesia is an opportunity for local anaesthesia for endovascular aortic aneurysm repair . This method needs further comparative studies.

References

1 Steib A., Collange O Anaesthesia for implantation of endovascular graft. Current Opinion in Anaesthesia 21(4):519–22,2008
2 Osswald P.M., Koch T Regonla anestesia- Pharmacology-Neurophysiology - Clinical Aspects Anestesiologie Intensivemedicinn Schmertzterapie 36(3) 167–170,2001

Paper No: 1196.0

Mini dose spinal anaesthesia for endovascular aneurysm repair of thoracic aorta

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Introduction: There is increased demand for modification of regional anaesthesia for modern surgical procedures including endovascular surgery of thoracic aortic aneurysm.

Minimal invasive surgery gives opportunity to operate old patients with high ASA scoring. In these cases preservation of leg movement is necessary for evaluation of spinal blood perfusion thus avoiding spinal ischemia during graft implementation. Seventeen patients presented for endovascular aortic aneurysm repair, ASA 2, 3, 4, age 33 to 86 years old (mean age 64 years), 14 male, 4 women were given" mini dose spinal anaesthesia". Endovascular graft implantation lasted no longer than 2 hours (mean time - 98 min). In this study mini dose spinal anesthesia with use of mixture of 25mcg of Fentanyl (o,5 ml), 2,5 mg of Heavy Marcaine (0,5 ml) and 0,5 ml of normal saline was used for regional technique necessary for endovascular repair of thoracic aortic aneurysm. Standard anesthetic technique was used except composition of local anaesthetic mixture. Level of analgesia was assessed 5 and 10 minutes after injection. Cardiovascular stability of the patient, level of analgesia, need of additional analgesia and leg movement were assessed during procedure . Level of analgesia was from L2 to Th10 in first 5minutes after injection and from L1 to Th10 after 10 minutes from drug administration. Additional intravenous opioid was necessary in 3 cases for pain relief. Fourteen patients were able to preserve movement during procedure and in recovery room. During all procedures no significant drop of blood pressure was noted . After procedure patients had no pain . It seems that mini dose spinal anaesthesia is an opportunity for local anaesthesia for endovascular aortic aneurysm repair . This method needs further comparative studies.

Keywords: minidose spinal anaesthesia; thoracic aneurysm repair

References

1 Steib A., Collange O Anaesthesia for implantation of endovascular graft. Current Opinion in Anaesthesia 21(4):519–22,2008

2 Osswald P.M., Koch T Regonla anestesia- Pharmacology-Neurophysiology - Clinical Aspects Anestesiologie Intensivemedicinn Schmertzterapie 36(3) 167–170,2001

Paper No: 1200.0

Comparison of Efficacy of Intraarticular Levobupivacaine and Bupivacaine on Postoperative Analgesia after Arthroscopic Knee Surgery

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Introduction: Intraarticular administration of local anesthetic solutions is used to provide better analgesia after knee arthroscopy and reduce consumption and possible side effects of oral and intravenous analgesics (1).

Objective: The aim of our study was to compare the efficacy of intraarticularly injected bupivacaine and levobupivacaine with morphine and epinephrine combination for postoperative pain control and functional recovery at knee surgery.

Methods: After obtaining Ethics Committee's approval and written informed consents, 60 patients of ASA I-II undergoing elective arthroscopic knee surgery under spinal anesthesia were enrolled in this study. All patients were medicated 50 mg intravenous dexketoprofen 30 minutes preoperatively. Patients were randomized into three groups equally. In Group B (n=20) 30 ml of %0.5 bupivacaine+2 mgr morphine+ 100 mcgr epinephrine, in group L (n=20) 30 ml of %0.5 levobupivacaine+ 2 mg morphine+ 100 mcgr epinephrine, in group C (n=20) 30 ml saline was given intraarticularly by surgical team at the end of the operation. Postoperative analgesia was provided by patient-controlled analgesia system with morphine. Pain scores at rest and on movement, and morphine consumption were evaluated at 2, 4, 6, 8, 12 and 24 h after surgery. Times to first analgesic requirement, first mobilization, positive response to straight leg raising test, tolerance to 30–50 degrees of knee flexion, and recovery of quadriceps reflexes, hospital discharge were evaluated. In addition, patient and surgeon satisfaction, and perioperative complications were recorded.

Results: There were no significant differences between demographic data between groups ($p<0.05$). The VAS values at rest and on movement in Group C were higher than in Group B and Group L at 2, 4, 6, 8, 12 and 24 h postoperatively ($p<0.001$ for all terms). In Group C, the time for first analgesic request was shorter postoperatively ($p<0.01$), total dosage of morphine was higher ($p<0.001$), and patient and surgeon satisfaction was lower ($p<0.01$, $p<0.01$). Times of positive response to straight leg raising test, tolerance to 30–50 degrees of knee flexion and the first mobilization were found to be significantly shorter in Group B and Group L ($p<0.001$ for all variables). No statistical differences were found between the three groups for patient and surgeon satisfaction, and time of hospital discharge.

Discussion and Conclusion. In the patients undergoing arthroscopic knee surgery under spinal anesthesia, intraarticularly injected levobupivacaine with morphine-epinephrine combination decreases the intensity of postoperative pain and analgesic consumption and increases the tolerance for mobilization like bupivacaine does. References: 1) Fu P, Wu Y, Wu H, Li X, Qian Q, Zhu Y. Efficacy of intra-articular cocktail analgesic injection in total knee arthroplasty - a randomized controlled trial. Knee 2009;16:280–4.

Paper No: 1202.0

Comparison of Clonidine and Buprenorphine as adjuvants to Bupivacaine for continuous Postoperative Epidural Analgesia

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Introduction: Addition of Opioid drugs to local anaesthetics epidurally is most effective in providing dynamic pain relief after major surgical procedures1. Buprenorphine, a mixed opioid agonist-antagonist, has been used widely epidurally in relieving post operative pain, but is associated with side effects like pruritus, sedation, nausea and vomiting. Clonidine, an á2 adrenergic agonist, is used to potentiate the local anaesthetic effect when given epidurally.2 We compared the efficacy of postoperative analgesia and their side effects with continuous epidural infusion of combination of Bupivacaine-Buprenorphine and Bupivacaine- Clonidine.
Methods: 60 adult patients ASA grade I- III, aged 20–80 years, scheduled for elective lower abdominal and lower limb surgeries were studied. Patients were administered either epidural anaesthesia alone or combined spinal epidural anaesthesia. A bolus of 0.25% bupivacaine 10 ml was given epidurally in the immediate post operative period, followed by a continuous infusion of 0.125% Bupivacaine with 1.25 mcg/ml of Buprenorphine (Group B) or continuous infusion of 0.125% Bupivacaine with 1.25 mcg/ml of clonidine (Group C) at the rate of 5ml/hr. Pain was assessed with visual analogue scale (VAS), motor block by Bromage scale, up to the 48 hours post operative period. Pethidine 20mg intravenous was used as rescue analgesic, if VAS >4, Data was analyzed by using ANOVA, Student's t-test and Chi-square test or Fischer's exact test.
Results: No significant difference in the VAS scores were noted between the two groups. Number of patients requiring rescue analgesic was significantly more in the Group C (43 ± 8.2 patients) compared to Group B (20 ± 0 patients) ($p=0.030$). Supplementary pethidine requirement was more with clonidine group (60 ± 25.5 mg) as compared to buprenorphine group (46.25 ± 18.93) at 24 hours. More patients in Group C (Bromage Score 1.1 ± 0.9) had motor blockade compared to Group B (0.6 ± 0.8) at all points of observation ($p<0.05$). Motor blockade was more intense in Group C ($p<0.000$). Incidence of nausea, vomiting and urinary retention were not significantly different between the groups. None of the patients in either group had hypotension, bradycardia, hypoventilation or sedation.
Conclusion: We found higher degree, and higher incidence of motor blockade with clonidine, compared to buprinorphine, making ambulation difficult during immediate post operative period. Also, rescue analgesic requirement was more when clonidine was used. Thus, clonidine may not be as efficient as buprenorphine as an adjuvant for post operative epidural analgesia.

References

1 BJA 2001; 87: 47–61.
2 Curr opin Anaesthesiol 2001; 14: 751–3.

Paper No: 1205.0

Echogenicity of Catheters Used for Ultrasound-Guided Continuous Peripheral Nerve Blocks

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Introduction: Modern regional anesthesia practice is increasingly utilizing ultrasound to perform or enhance nerve block placement. The successful placement of an ultrasound-guided continuous peripheral nerve block relies on image quality of various components including target nerve, surrounding structures, needle placement and perineural catheter (1,2). Catheter visualization during insertion is crucial to ensure accurate placement and analgesic efficacy of the perineural local anesthetic infusion. Although a number of studies have examined needle echogenicity, limited data exist regarding the echogenicity of perineural catheters. The objectives of this study were to determine the comparative echogenicity of various regional anesthesia catheters.
Methods: We developed a porcine animal model to facilitate the comparison of different nerve block catheters' echogenic qualities. Three commercially available nerve block catheters [Arrows StimCath® (Arrows International Inc., Reading, PA), B.Braun PeriFix FX® and B.Braun Contiplex® (B. Braun Medical Inc., Bethlehem, PA)] and a catheter under development (Epimed International, Inc. Johnstown, NY) to optimize echogenicity were studied. All catheters were inserted at 45 degrees to the skin by an un-blinded investigator who was not involved in subsequent testing. The order of catheter insertion was randomized using a computer-generated randomization sequence. Outcome measures included an overall catheter visibility assessment (0–10), artifact (0–10), shadowing (0–10), contrast (0–10), scan time (secs), catheter length seen (%), and catheter photodensity in echogenic units (EU). Catheter scanning and visual assessments were performed by investigators blinded to catheter brand or study order.
Results: We observed statistically-significant echogenicity variability among the catheters studied. Initial results suggest that the Arrow catheter appeared less echogenic than both the B.Braun catheter and Epimed catheter by both subjective and objective measurements ($P<0.01$). The less echogenic catheter was associated with longer scanning times and less catheter length visibility ($P<0.01$). The Epimed catheter under development demonstrated superior echogenic properties over the other commercially available catheters.
Conclusion: Preliminary results from this animal model demonstrate that catheters used for regional anesthesia display a wide range of echogenicity under ultrasound imaging. This

study demonstrates that catheters can be developed to be more echogenic. Future studies are required to show if this echogenic advantage observed in an animal model is also seen in a clinical model and if this leads to greater analgesic success with continuous peripheral nerve blocks.

References

1 Reg Anesth Pain Med 2007;32:440–447
2 Reg Anesth Pain Med 2004;29:480–488

Paper No: 1208.0

Peritoneal nebulization of ropivacaine reduces morphine consumption after gynecologic laparoscopic surgery

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Introduction: Pain after laparoscopy has been associated to changes in temperature, humidity and pH of the intra-abdominal environment. Peritoneal nebulization of local anesthetic is a novel analgesic method for postoperative pain control after laparoscopic surgery1. Nebulization of Ropivacaine with a microvibration-based device (AeronebPro® system, Aerogen, Galway, Ireland) and delivered into the insufflation gas significantly reduced pain, morphine consumption and deambulation time after gynaecological laparoscopic surgery when compared with placebo2.
Objective: This double blind phase III randomized controlled trial was designed to compare the effects of peritoneal nebulization of ropivacaine 150 mg with peritoneal instillation of ropivacaine 150 mg on morphine consumption and pain after ovarian cyst laparoscopic surgery.
Methods: After IRB approval (NCT01142622) and written informed consent, 63 ASA I-III patients scheduled for laparoscopic ovarian cystectomy were enrolled. Patients were randomized to receive peritoneal nebulization of Ropivacaine 150 mg+instillation of saline (NEBU group) or direct instillation of Ropivacaine 150 mg+nebulization of saline (INSTILLATION group). Ropivacaine was nebulized using the AeronebPro® system (Aerogen Galway, Ireland) through the umbilical port during surgery. Postoperative analgesia was provided with wound infiltration, IV paracetamol 15 mg/kg every 6 h and IV morphine PCA. Morphine consumption, pain intensity (dynamic NRS 0 to 10 points), incidence of severe pain (NRS>3), deambulation time and incidence of shivering or PONV were collect in PACU and at 6, and 24 h after surgery.
Results: Sixty three patients, 32 on NEBU group and 31 in INSTILLATION group completed the study. Patients in NEBU group required less morphine (5 ± 5 mg) than those in INSTILLATION group (8 ± 7 mg) ($p<0,05$). Patients receiving ropivacaine nebulization referred lower pain scores in PACU (3 ± 2 points) and six hours after surgery (2 ± 2 points) compared with those on INSTILLATION group (PACU 5 ± 2 points, six hours 3 ± 2 points) Patients receiving ropivacaine nebulization walked earlier (10 ± 6 hours) than those in INSTILLATION group (16 ± 10 hours) ($p<0.01$). There were no differences between groups in incidence of shoulder pain or PONV. Seven of 32 (22%) patients on NEBU group referred shivering in PACU compared with one (3%) patient in INSTILLATION Group ($p=0,02$).
Conclusion: Cold nebulization of Ropivacaine 150 mg with AeronebPro® system reduces morphine consumption, postoperative pain and unassisted walking time when compared with ropivacaine instillation. Ropivacaine nebulization was associated with a higher incidence of shivering in PACU.

References

1 Alkhamesi NA, Peck DH, Lomax DA, Darzi W. Intraperitoneal aerosolization of bupivacaine reduces postoperative pain in laparoscopic surgery: a randomized prospective controlled double-blinded clinical trial. *Surg Endosc* 2007; **21**: 602–60
2 Ingelmo P, Bucciero M, Somaini M, Fumagalli R, Diemunsch P. Peritoneal ropivacaine nebulization for pain control after gynaecologic laparoscopic surgery. *European Journal of Anaesthesiology* 2010; **27**(47): 212

Paper No: 1209.0

Does 5 ml bolus volumes and fluoroscopic assessment affect hemidiaphragm incidence after brachial plexus blocks?

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Introduction: The use of large volumes of anesthetics for boluses to accomplish an adequate Brachail Plexus block via the interscalene approach is unnecessary and can cause harmful side effects. These side effects include phrenic nerve paralysis, horner's syndrome, and recurrent larngeal nerve paralysis. Phrenic nerve paralysis can lead to atelectasis and hypoxia. The purpose of this retrospective review was to access the incidence of phrenic nerve paralysis in patients after low 5 ml bolus volumes during brachial plexus blocks via the interscalene approach. Phrenic nerve parlaysis was assessed by fluoroscopic examination for hemidiaphragm.
Objectives. To assess for phrenic nerve paralysis using fluoroscopic examination of diaphragmatic function after low bolus volumes with brachial plexus blocks via interscalene approach.

Methods: A chart review of 47 patients following low volume boluses of 5 mls of either 3% chloroprocaine or 2% lidocaine 1/200,000 epinephrine for postoperative pain control following shoulder surgery. The Continuous plexus anesthesia catheter was placed through a 18 g touhy. A sniff test was performed to assess for hemidiaphragm no sooner than 30 minutes following the completion of the block. Data Collection was from a midwestern regional medical center. Data was compiled to microsoft excel spreadsheet for standardization.
Results: The review of 47 patient charts revealed a 44.7% incidence of hemidiaphragm following 5 ml boluses as compared to the assumed 100% using more traditional volumes. Also noted on chart review was a 0% incidence of recurrent larngeal nerve paralysis and a 2% (1 case) of horner's syndrome. The average BMI was 33. The average ASA classification was two. The length of intraoperative cases varied from 1.5 to 3 hours.
Conclusion: a local anesthetic dose of 5 mls for interscalene blocks was sufficient for adequate postoperative pain control. This reduced volume revealed a lower incidence of unwanted side effects such as phrenic nerve paralysis, recurrent larngeal nerve paralysis, and horner's syndrome. Despite this reduction in side effects while using this technique one cannot predict the which patients will have phrenic nerve paralysis. REFERENCE: Extensive list would like to email

Paper No: 1227.0

The effects of preoperative single-dose gabapentin on postoperative pain after inguinal hernia surgery under spinal anesthesia

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Introduction: Pain management in patients undergoing inguinal herniorrhaphy includes local anesthetics, NSAIDs, acetominophen and opioids. However, analgesia is often unsatisfactory despite all these options. Recently, various clinical studies regarding the potential role of gabapentin in postoperative analgesia have been published (1).
Objectives. In this study, the aim was to evaluate the effects of single-dose preoperative gabapentin on postoperative analgesia and spinal anesthesia characteristics in patients undergoing inguinal hernia surgery under spinal anesthesia.
Methods: After obtaining the approval of the ethics committe, 50 patients – aged 18 and 70 years, ASA I/II - were included in this prospective, placebo controlled, and double blind study. The patients were randomly divided into two equal groups. The gabapentin group (n=25) received single-dose 800 mg oral gabapentin 1 h before surgery and the Control Group received a placebo capsule instead (n=25). Spinal anesthesia with 0.5% bupivacaine 3 ml was induced in cases that were placed in the sitting position following monitorization. Hemodynamic parameters, characteristics of spinal anesthesia (sensory and motor block levels, time to two segment regression from peak sensory block, duration of motor block), intraoperative and postoperative complications, severity of postoperative pain, morphine consumption, and times to first analgesic requirement and hospital discharge were recorded.
Results: Hemodynamic parameters, characteristics of spinal anesthesia, and severity of postoperative pain were similar between the groups. Postoperative morphine consumption at all measurement periods was lower in the Gabapentin group ($p<0.05$). In addition, time to first analgesic requirement was longer and time to hospital discharge was shorter in the Gabapentin group ($p<0.05$, $p<0.05$).

Discussion and Conclusion. We concluded that preoperative single-dose gabapentin reduces postoperative morphine consumption and shortens duration of hospital stay without altering the characteristics of spinal anesthesia after inguinal herniorrhaphy.

References

1 Hurley RW, Cohen SP, Williams KA, Rowlingson AJ, Wu CL. The analgesic effects of perioperative gabapentin on postoperative pain: a meta-analysis. *Reg Anesth Pain Med* 2006; **1**: 237–47.

Paper No: 1242.0

Comfort during ultrasound guided interscalene brachial plexus block - local anaesthetic to the skin is more painful than the block needle

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Introduction: The interscalene brachial plexus block is commonly used to provide anaesthesia and analgesia for shoulder surgery. To increase safety should normally be performed in awake patients.(1) With this in mind we investigated patient comfort during interscalene block.
Objectives. To measure pain during the interscalene block and to evaluate whether prior local anaesthetic skin infiltration reduces overall discomfort.
Methods: 102 unsedated patients underwent in-plane ultrasound guided interscalene brachial plexus block prior to shoulder surgery. Technique was standardised for all patients with the only difference being that half had skin infiltration with 1% lidocaine using a 25G needle followed by a 1 minute pause prior to introducing the block cannula - (group L). Group N received no prior skin anaesthetic. Each patient received an 18 or 20G intravenous cannula. All

blocks were performed with a 22G block needle. Number of attempts, depth to the plexus, time to perform the block, volume of anaesthetic around the plexus and complications were recorded. Patients were asked to score pain on a 0–100 scale immediately after each stage and rate overall satisfaction.

Results: Patient demographics and procedural data in the two groups were very similar. Mean pain score for intravenous cannulation was 16 vs 24 in groups L and N respectively. Mean pain score for skin infiltration in group L was 26. Pain from skin puncture with the block needle was 9 vs 21 in groups L and N respectively. Needling pain scores were 18 vs 24. Infiltration of the plexus caused mean pain scores of 33 and 34 in L & N respectively. Plexus infiltration was most painful in 82% and 64% in groups L and N respectively. In group L, 18% of patients found skin infiltration the most painful part. In group N, intravenous cannulation was next frequently reported most painful (24%). Overall satisfaction was high in both groups - 90% & 96% in groups L & N.

Conclusions. We found that skin infiltration was more painful than introduction of a 22G block needle without anaesthetising the skin. The most painful part of the interscalene block is infiltrating the plexus. Pain scores were lower for skin puncture than intravenous cannulation. Almost 20% of patients found skin infiltration the most painful. These results suggest that anaesthetising the skin should not be routine practice for interscalene brachial plexus block. To our knowledge this is the first time such data has been presented.

Reference

1 Neal JM, *et al.* ASRA Practice Advisory on Neurologic Complications in Regional Anesthesia and Pain Medicine. *Reg Anesth. Pain Med.* 2008 Sep–Oct;**33**(5): 404–15

Paper No: 1301.0

Epidural anesthesia for minimal access spine surgery for lumbar disc desease

Maria E. Interiano, Ena Miller and Roberto Contreras

Introduction: Today back pain is one of the most frecuent cause of medical consultation and disc herniation a comon cause of back pain. Of all disc desease at least 15% requires surgical intervention., this is the mean reason why it is important to perform the least invasive surgical and anesthethc thecnique to solve the problem with least trauma, less risk, fast recovery and less post operative pain, returning the patient to a productive life as soon as possible..

Objectives. To evaluate all the benefits of peridural anesthesia for lumbar disc surgery (pain, blood loss, cost, and operative time;) to demonstrate that fraccionated low dose peridural anesthesia could be an alternative for performing this surgery.

Methods: More than 60 patients where submited to lumbar disc surgery with peridural anesthesia. All patients received 2mg of midazolam before lumbar puncture. A peridural catheter was inserted in place utilizing loss of resistence with saline technique. Two levels above the patological disc was used, directing the catheter in a cefalic direction aproximately 12 mm, all patiens received a trial dose of 3ml of 1% lidocaine, after which a combination of simple bupivacaina at 5%: 25 mg,fentanyl 100mg, and 2% lidocaine 60 mg=10 ml. Soon after the patient was asked to lie on the stomach, and 3ml more of the preparation. Confort was evaluated in all cases and their acceptance of the procedure.. visual analogue pain, blood loss, operative time, cost, complications results it was found that all the patiens submited to this anesthetic technique had less blood loss, tolerated the prodedure well. Cost were less compared to patients receiving general anesthesia for the same procedure, reduction of post op pain and of complications permited the early movilization of the patient. This technique also permited to prove concordance of the previous painfull radicular symptoms with local stimulation during surgery, because the patient is concious, or awake. Conclusions peridural anesthesia is a technique that was well tolarated and accepted in the population submited to the study, making the surgical option more atractive for those cases where all other treatment modalities failled. There was less incidence of bleeding complications. The patients submited to this kind of anesthesia had less post operative pain, requiring less need for opiates as other studies have demonstrated. Peridural anesthesia kind be considered as an alternative reliable technique for the management of lumbar disc desease, references Quality of Postoperative Pain Using an Intraoperatively Placed Epidural Catheter after Major Lumbar Spinal Surgery André Gottschalk, M.D.,* Marc Freitag, M.D.,* Sascha Tank,† Marc-Alexander Burmeister, M.D.,‡ Sonja Kreißl, M.D.,§ Ralph Kothe, M.D.,_ Nils Hansen-Algenstedt, M.D.,_ Lothar Weisner, M.D.,_ Hans-Jürgen Staude, M.D.,** Thomas Standl, M.D., Ph.D.† Anesthesiology 2004; 101:175–80 © 2004

Spinal Anesthesia for Lumbar Disc Surgery: Review of 576 Operations DAVID J. SILVER, MD* REMBRANDT H. DUNSMORE, MDt CHARLES M. DICKSON, MDf Hartford, Conneticut ANESTHESAIAND ANALGES.I .A . Current Researches vni.. 55, No. 4, JULY-AUGUS1T9,7 6

Major complications of epidural analgesia after surgery: results of a six-year survey

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Anaesthesia, 2007, 62, pages 335–341

A prospective randomized study comparing perioperative outcome variables after epidural or general anesthesia for lumbar disc surgery demiel, cengiz bekir, kalayci, murat journal of neurosurgical anesthesiology lujy 2003, vol 15, issue 3, p 185 –192

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Paper No: 1313.0

The impact of needle tip location for lateral popliteal sciatic nerve block: a 3-D ultrasound study of local anesthetic spread

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Introduction: During lateral popliteal block performed with nerve stimulation, there are accepted parameters regarding the end-point for local anesthetic injection (1). Currently, there is no clear understanding of what these parameters should be for ultrasound-guided lateral popliteal block. Recently, circumferential spread of local anesthetic around the sciatic nerve has been demonstrated to improve the rate of sensory block (2).

Objectives. We hypothesize that injecting local anesthetic beneath the sheath of the sciatic nerve at the level of the bifurcation will result in greater local anesthetic contact with the sciatic epineureum and greater block success. In order to accurately assess perineural local anesthetic spread and distinguish between injections made outside or within the fascial sheath, 3D ultrasound was employed to quantify injectate distribution along the sciatic nerve.

Methods: After IRB approval, 23 patients were enrolled in this prospective randomized double-blinded study. Each patient was randomly assigned to either the subfascial or the suprafascial injection groups. Exclusion criteria included extremes of age (<18 or >85), any contraindication for regional anesthesia, and preexisting neuropathy. Ultrasound-guided lateral popliteal nerve blocks were placed using a 22-gauge 100mm insulated needle (Stimuplex B|Braun) with an in-plane approach at the level of the sciatic bifurcation. Depending on group assignment, the needle tip was placed outside or beneath the sciatic sheath for the single injection of 30mL of 0.5% Ropivacaine. Using 3D Ultrasound imaging (BK Medical) with a 12-MHz linear probe, post-block scans of the sciatic nerve were obtained 50mm proximal and 50mm distal to the point of injection. Motor and sensory block to pin-prick was assessed in 5-minute intervals for 30 minutes in the peroneal and tibial nerve territories. Unpaired t-test was employed for statistical analysis.

Results: Out of 23 patients that were initially enrolled in this trial, 3 patients were excluded due to screening failure. Using 3D volumetric reconstruction of the 100mm sciatic nerve scans, we calculated the volume of local anesthetic in contact with the nerve for the remaining patients. The volume of ropivacaine in contact with the sciatic nerve was a mean of 1.232mL$+$0.156 for the suprafascial group versus a mean of 4.967mL$+$0.982 for the subfascial group, $p<0.0001$. Sensory block for the suprafascial group was 33.3% versus 90% for the subfascial group. Fascial "clicks" were observed in 20% of the suprafascial group and 90% of the subfascial group.

Conclusions: Under ultrasonography, placement of the needle tip beneath the sciatic nerve sheath resulted in significantly greater local anesthetic contact with the epineureum following a single-injection lateral popliteal approach at the nerve bifurcation and was associated with improved sensory blockade.

References

1 Macfarlane AJ, Bhatia A, Brull R. Needle to nerve proximity: what do the animal studies tell us? *Reg Anesth Pain Med*. 2011 May–Jun;**36**(3): 290–302.

2 Brull R, Macfarlane AJ, Parrington SJ, Koshkin A, Chan VW. Is circumferential injection advantageous for ultrasound-guided popliteal sciatic nerve block?: *A proof-of-concept study. Reg Anesth Pain Med*. 2011 May–Jun; **36**(3): 266–70

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RESPIRATION

(The names of the authors presenting each paper are shown in bold type)

Paper No: 49.00

The influence of thoracic epidural anesthesia on oxygenation and shunt during one lung ventilation

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Introduction: Thoracic epidural anesthesia (TEA) with local anesthetics is increasingly combined with general anesthesia (GA) for thoracic surgery, especially for procedures involving one-lung ventilation (OLV). Furthermore, this combination of TEA and GA is preferred, since it could maximize the advantages of each anesthetic technique. However, the effect of TEA with local anesthetics on hypoxic pulmonary vasoconstriction (HPV), as well as oxygenation and shunt during OLV still remains unclear.

Objectives: The goal of this study was to assess oxygenation and shunt during GA with OLV, in combination GA/TEA with OLV, and to compare values obtained throughout both anesthetic techniques.

Methods: Sixty patients scheduled for elective thoracic surgery were enrolled in this prospective clinical study. They were randomly allocated into two groups (n=30 each). In GA group, fentanyl/propofol/rocuronium anesthesia was used. The patients in TEA group were anesthetized with fentanyl/propofol/rocuronium plus epidural thoracic bupivacaine 0.25%, 6-8 ml/h. A double-lumen endobronchial tube was inserted, and mechanical ventilation with 50% oxygen in air was used during the entire study. Arterial blood gases were recorded in lateral decubitus position with two-lung ventilation, at the beginning of OLV (OLV 0) and 10 and 30 min. after its initiation (OLV 10, OLV 30, respectively). Arterial partial pressure of oxygen(PaO2), arterial oxygen saturation(SaO2) and intrapulmonary shunt(Qs/Qt) were measured. The quantitative value of Qs/Qt was mathematically calculated by the blood gas analyzer AVL Compact 3. The p value <0.05 was set to be statistically significant.

Results: When OLV was instituted arterial oxygenation decreased, whereas Qs/Qt increased, about 10 min. of the commencement, with improving of the oxygenation approximately half an hour afterwards. Statistical difference ($p < 0,05$) occurred inside the groups regarding PaO2, SaO2 and Qs/Qt in the different measurings. There were no statistical differences ($p>0,05$) between the two groups for PaO2 at OLV 10 (GA = 13,78+/-5,84 kPa, TEA = 11,87+/-4,95 kPa) and OLV 30 (GA = 15,66+/-6,62kPa, TEA = 14,88+/-4,45kPa); for SaO2 at OLV 10 (GA = 93,52+/-6,03%, TEA = 92,92+/-5,2%) and OLV 30 (GA = 95,31+/-4,62%, TEA = 95,89+/-3,78 %) and with values of Qs/Qt at OLV 10 (GA = 8,03+/-10,59%, TEA = 10,93+/-10,80%) and OLV 30 (GA = 3,94+/-6,21%, TEA = 4,8+/-7,58%).

Conclusions: Hypoxia during OLV with increase of Qs/Qt usually occurs after 10 min.of its initiation, during GA, as well as combined GA and TEA. Following 30 min. of beginning of OLV, the values of Qs/Qt regularly start to decrease towards normal quantities. Both techniques, GA and GA combined with TEA are suitable for thoracic surgery when OLV is used, considering arterial oxygenation.

References

1. Von Dossow V, Welte M, Zaune U, Martin E, Walter M, Rückert J, Kox WJ, Spies CD. Thoracic Epidural Anesthesia Combined with General Anesthesia: The Preferred Anesthetic Technique for Thoracic Surgery. *Anesth Analg* 2001; **92**: 848–854.
2. Mineo TC. Epidural anesthesia in awake thoracic surgery. *Eur J Cardiothorac Surg* 2007; **32**: 13–19.
3. Ishibe Y, Shiokawa Y, Umeda T, *et al.* The effect of thoracic epidural anesthesia on hypoxic pulmonary vasoconstriction in dogs: an analysis of the pressure-flow curve. *Anesth Analg* 1996; **82**: 1049–55.
4. Chow MY, Goh MH, Boey SK, Thirugnanam A, Ip-Yam PC. The Effects of Remifentanil and Thoracic Epidural on Oxygenation and Pulmonary Shunt Fraction During One-Lung Ventilation. *J Cardioth Vasc Anesth* 2003; **17**(1): 69–72.

5. Garutti I, Cruz P, Olmedilla L, Barrio JM, Cruz A, Fernandez C, Perez-Peña JM. Effects of Thoracic Epidural Meperidine on Arterial Oxygenation During One-Lung Ventilation in Thoracic Surgery. *J Cardioth Vasc Anesth* 2003; **17**(3): 302–305.

Paper No: 72.00

Evaluation of the costs and utilization of operating rooms in a public hospital in trinidad

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Introduction: In Government funded healthcare sectors such as in Trinidad & Tobago, the expenditure for operating rooms (OR) is a key area to be evaluated. The objective of every public healthcare system is to make the service more cost-efficient, yet retain the standard of care. Most cost evaluation studies analyze the 'cost-effectiveness' of individual surgical treatments; there have been few attempts to study the 'cost-efficiency' of OR as a 'system'. This study evaluates this paradigm from the exchequer's perspective.
Objectives: To determine the cost of running OR in a public hospital and to relate to its efficient utilization.
Methods: A "cost-block" model which included capital expenditure, estate, non-clinical support services, clinical support services, consumables and staff was adapted to identify the costs of running OR in a public hospital during two time-periods: 2006 and 2009. Data were obtained from Human Resources, Administration, Finance, Pharmacy, Stores and Biomedical Engineering Departments. Total annual costs, cost per OR, cost per patient and cost per hour were calculated. OR utilization hours were also recorded for the two time-periods.
Results: Capital expenditure contributed to 70% of the costs. Consumables were the second expensive block followed by staff salary. The total annual costs of running 4 ORs for the years 2006 and 2009 were approximately US$ 2.3 and 3.3 million respectively. The cost of running the four ORs per day was approximately US$ 6350 in 2006 which increased to US$ 9015 in 2009. Costs per patient were US$ 1570 and 1650, cost of one hour of OR time was approximately US$ 70 and 98 in 2006 and 2009. The total number of elective surgery hours unutilized was 4588 in 2006 and 2145 in 2009. The cost of this underutilization was US$ 316,000 during 2006 and US$ 200,000 during 2009.
Conclusions: The adapted "Cost-Block" model was useful to evaluate the costs of running ORs in a Public Hospital in Trinidad. This analysis may assist policy makers to optimize the functioning of the operating room services from the Government's perspective.

References

1. Overdyk FJ, Harvey SC, Fishman RL, Shippey F. Successful strategies for improving operating room efficiency at academic institutions. *Anesth Analg* 1998; **86**(4):896-906
2. Mazzei W J. Maximizing operating room utilization: A landmark study. *Anesth Analg* 1999; **89**(1):1-2
3. Hariharan S, Chen D, Merritt-Charles L. Cost evaluation in the intensive care units of Trinidad applying the cost-blocks method–an international comparison. Anaesthesia 2007; **62**: 244–249

Paper No: 150.00

Advanced airway management by anesthesiologists during the FIS Alpine Ski World Championship 2011 in Germany

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Introduction: The Bavarian Mountain Rescue Services "Bergwacht" (MRS) was responsible for rescue services in mountain areas during the 11th FIS Alpine Ski World Championship 2011 in Garmisch-Partenkirchen, Germany. According to the FIS medical guide any critically injured athlete along the course has to be reached by a trauma teams trained in Advanced Cardiac or Trauma Life Support and advanced airway management within 4 minuntes after the incident.
Objectives: Together with 18 first responders of the MRS eight emergency physicians were on duty along the race course during every training and race for injured athletes using rescue-sledges together with air-rescue-bags for hoist evacuation. At least four anesthesia consultants also holding Diploma in Mountain Medicine and Mountain Emergency Medicine were positioned at risky hazard spots, equipped with ski, crampons and climbing harness. For transportation to accident scenes further afield they used a skidoo as well as rescue helicopter equipped with a rescue winch. They were equipped with special emergency backpacks containing oxygen cylinders, face masks and ventilation bags, emergency respirator, fluids and medication to support circulation and airway management equipment. Airways could be managed by endotracheal intubation, supraglottic airway devices or by cricothyroidotomy, facilitated with intravenous anesthetics, opioids and muscle relaxants. For monitoring pulse oximetry and automated external defibrillators with ECG-monitoring screen were used.
Plan of actions: In case of an accident on the slope a first evaluation was performed by the MRS member nearby. Together with the emergency physician the injured athlete was stabilized for transportation by MRS with the rescue-sledge and accompanied by the physician. Patients with

severe head-injuries, multiple trauma, etc. should by intubated if mandatory at the scene. To handle possible problems during airway management, the anesthetists could help themselves using their advanced equipment. After establishing a secure airway the patient should be evacuated from the scene under assisted ventilation accompanied by the anesthetist with the rescue winch from the helicopter. Severely injured patients should be directly transferred to the next trauma center by rescue helicopter.

Results: During the FIS World Championship 2011 six athletes suffered distortions of the thumb or ankle joint, cruciate ligament ruptures or contusions of the cervical spine. Fortunately, no severe accident happened and no athlete needed to be intubated by the anesthetists.

Discussion: Based on our experience and regardless of the fact that no major accident happened during the FIS World Championship 2011, organizers of forthcoming alpine speed competitions should establish MRS teams in combination with specially trained airway experts.

Paper No: 157.00

A Novel Airway Management Technique for Bearded and Edentulous Patients

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Introduction: Airway management techniques are of paramount importance whenever encountering difficult airway situations such as those found in edentulous or bearded patients. We illustrate an innovative technique using commonly found anesthesia equipment.

Objectives: Describe a distinct mask ventilation technique with slight variations for edentulous or bearded patients that can be used globally.

Methods: After pre-oxygenation and induction of anesthesia, an appropriate size nasal airway is inserted in the patient's nostril and a toddler size mask is used to ventilate the patient. The mask extends from the bridge of the nose to the alveolar ridge. The ventilation is totally accomplished through the nostrils.

Results: A literature review has supported the uniqueness of this approach

Conclusions: Difficult mask ventilation has a reported prevalence of 5% and requires a wide range of interventions. As Benumof states regarding the degree of difficulty: "mask ventilation can range from zero to infinite"(1). Edentulous and bearded patients are high risk for difficult masking (1,4). Approaches to difficult mask ventilation involves modifications of anatomy, positioning, the use of specialized equipment, and even methods of circumventing this difficult task (1,2,3,5,6,7). Our approach affords advantages over a technique that Racine, et al. described(7). In our easy to teach technique the neck is not extended, one person conducts ventilation and the mask is not used to ventilate through the mouth. Based on established criteria of difficulty of mask ventilation, this technique provides easy ventilation despite increased risk factors (4).

References

1. Benumof JL. 1991. "Management of the Difficult Adult Airway: With Special Emphasis on Awake Tracheal Intubation". *Anesthesiology*. **75**: p1087-1110.
2. Conlon NP, *et al.* 2007. "The effect of leaving dentures in place on bag-mask ventilation at induction of general anesthesia." *Anesth Analg*. **105**(2):370-3.
3. Heuer JF, *et al.* 2010. "Initial ventilation through laryngeal tube instead of face mask in out-of-hospital cardiopulmonary arrest is effective and safe." *Eur J Emerg Med*. **17**(1):10-5.
4. Langeron O, *et al.* 2000. "Prediction of Difficult Mask Ventilation". *Anesthesiology*. **92**: 1229–36.
5. Lanier WL. 1987. "Improving anesthesia mask fit in edentulous patients." *Anesth Analg*. **66**(10):1053.
6. Nakanishi K, *et al.* 2009. "[Successful oral fiberoptic intubation by a double-lumen tube under the ventilation only via nostrils with a child size mask in a patient with limited mouth opening]". *Masui - Japanese Journal of Anesthesiology*. **58**(5):616-619.
7. Racine SX, *et al.* 2010. "Face mask ventilation in edentulous patients: a comparison of mandibular groove and lower lip placement". *Anesthesiology*. **112**(5):1190-3.

Paper No: 213.00

Airway management with pentax airway scope (pentax-aws®). complications and incidents

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Introduction: Maintaining patient airway is essential for adequate oxygenation and failure to do so, even for a brief period of time, can be life threatening.

Objectives: The aim of this study was to evaluate the use of Pentax-AWS® in the management of the airway, evaluating the indications, benefits and possible limitations of their employment.

Methods: The protocol was approved by the clinical research committee of each institution, and written informed consent was obtained from 61 patients scheduled for elective surgery, requiring general anaesthesia with tracheal intubation. Intubations were performed by 3 anesthesiologists with little experience in handling the device (less than 10 uses). Preoperatively, predictors of difficult airway (PDW) were considered: Body mass index (BMI)$>$35 kg/m^2; Mallampati scale class III or IV; interincisor distance$<$3 cm; thyromental distance$>$6 cm; sterno-mental distance$<$12 cm; Atlanto occipital joint$<15^\circ$ and a class III in the bite test. In the operating room, it was collected the number of

attempts to get the intubation, the degree of visualization of vocal cords with Pentax-AWS ® (1: view of the glottis in the middle of viewfinder, 2: glottis not centered on the target mark, 3: view of the glottis and epiglottis; 4: Visualization of only epiglottis, 5: inability to see epiglottis) and complications encountered during use .

Results: Of 61 patients, 11 patients (18%) had 2 or more PDW. It was possible to insert the blade of the Pentax-AWS and to see a full view of the glottis on the first attempt in 93'5%(57 patients) : the view was optimal (grade 1: 32 patients, 52.5%) or suboptimal (grade 2: 25 patients, 41%); in 4 patients (6'5%), the view was grade 4; we viewed always the epiglottis. Tracheal intubation was successful in all patients. The main complications encountered were failing to lift the epiglottis and advance into the vallecula (in 9 patients of 11 that had predictors of difficult airway).

Conclusions: In our experience, it was generally easy to insert the Pentax-AWS to obtain a full view of the glottis and to intubate the trachea, without major complications; it has great potential to become a standard technique of laryngoscopy for tracheal intubation

References

1. Koyama J, Aoyama T *et al.* Description and first clinical application of AirWay Scope for tracheal intubation. jJournal of Neurosurgical Anesthesiology 2006; **18**: 247–50.

Paper No: 229.00

Ease of tracheal intubation via a fiberscope through disposable fastrach mask vs i-gel mask: preliminary study

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Introduction: Supraglottic devices are increasingly being used to secure the airway. Worthy of special interest are those disposable devices through which an endotracheal tube can be introduced to ensure the airway, such as the LMA Fastrach Disposable Mask, or ILMA, and the i-gel Mask. Intubation visualising the trachea through the laryngeal mask is potentially faster, most comfortable and safer than blind progress, for which a flexible fiberscope is recommended.

Objectives: The aim of the study is to compare the ease of insertion of an endotracheal tube through two disposable supraglottic devices, the ILMA and the i-gel, using a flexible fiberscope.

Methods: It is a controlled, randomised and prospective clinical study. It includes up to 30 patients undergoing elective surgery under general anaesthesia requiring tracheal intubation. Patients are randomised into two groups, disposable ILMA and i-gel. They are ASA I, II and III patients, between 18 and 65, without evidence of difficult ventilation and/or intubation. The following were assessed:

- Insertion time of each device.
- Endoscopic visualisation of the glottis via Brimacombe classification.
- Percentage of successful tracheal intubation through the device at the first attempt.
- Perioperative adverse events.

Results: Insertion time for the disposable ILMA was 30 ± 10 seconds versus 38 ± 21 sec for the i-gel, checking bilateral pulmonary ventilation and absence of leakage. Both masks have been inserted by staff anaesthesiologists with extensive experience in supraglottic devices. The fiberoptic view of the glottis showed an optimal position (grades 3 and 4 of the Brimacombe classification) in 14 of the 15 cases in which the ILMA was used, compared to 11 of 15 in the i-gel group. In the remaining cases the anterior epiglottis was partially visualised and it was impossible to reject it in 2 cases in the i-gel group, making tracheal intubation through it impossible. Fibroscopy-guided tracheal intubation was successful in 100% of patients in the disposable ILMA group at the first attempt, while it was difficult in 2 patients in the i-gel group, and impossible in 2 patients of the same group. This is a preliminary open study in which patients are still being included. DISCUSION The correct placement of the disposable ILMA has been found to be more successful than that of the i-gel, with a lower insertion time. With regard to tracheal intubation by fiberscope through it, the disposable ILMA has also been found to be superior, with no recordings to date of any failed cases, although the number of cases included so far is still insufficient to draw firm conclusions.

Conclusions: It can be concluded that there is an alternative in the management of the airway with the use of two separate supraglottic devices, which, guided by a fiberscope, account for successful tracheal intubation in almost 100% of cases when using the ILMA Mask.

References

1. Robert Greif MD, Lorenz G Theiler MD. ILMA Fastrach Versus I-gel for Fiberoptic Tracheal Intubation. *ClinicalTrials.gov*, 2009-2010, ID. NCT00888875. In: http//www.clinicaltrials.gov/ct2/show/study/NCT00888875.
2. Nathalie Massicotte. Comparison of LMA-Fastrach and I-gel for Blind Tracheal Intubation. *ClinicalTrials.gov*, 2009-2010, ID. NCT01007370. In: http://clinicaltrials.gov/ct2/show/NCT01007370.
3. Michalek P, Donaldson W, Graham C, Hinds JD. A comparison of the I-gel supraglottic airway as a conduit for tracheal intubation with the intubating laryngeal mask airway: a manikin study. *Resuscitation* 2010; **81**: 74–7.
4. Xue FS, Wang Q, Yuan YJ, Xiong J, Liao X. Comparison of the I-gel supraglottic airway as a conduit for tracheal intubation with the intubating laryngeal mask airway. *Resuscitation* 2010; **81**: 910–1.
5. Lloyd L, Hodzovic I, Voisey S, Wilkes A, Latto P. Comparison of fibrescope guided intubation via the classic laryngeal mask airway and i-gel in a manikin.*Anaesthesia* 2010; **65**: 36–43.

Paper No: 263.00

Upper lip bite test versus modified mallampati classification as a predictors of difficult endotracheal intubation in spanish population

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Introduction: In attempting to improve the preoperative diagnostic of difficult Endotracheal Intubation (ETI) in patients, different tests have been evaluated as predictors of difficult airway; Up until now, Upper Lip Bite Test (ULBT) has been studied in different countries: Iran1, Germany2, Venezuela3, and the USA4 (Table 1). This test has to be evaluated in different populations to be approved. The ULBT has not been studied as a preoperative predictor of difficult endotracheal intubation in Spain; This study was performed to evalute the ULBT in our population; We compared the ULBT́s results against the results of the goal standard test for predicting difficult intubation, the Modified Mallampati Classification (MMC). In addition to this, we added both test results (ULBT+MMC) and compared them together against unique MMC test as predictors to detect the patients at a higher risk for difficult endotracheal intubation.

Table 1. Studies of ULBT in different countries

	Iran1	Germany2	Venezuela3	USA4
Sensibility of the ULBT	76,5%	28,2%	20%	55%
Specificity of the ULBT	88,7%	92,5%	100%	97%

Objectives: To compare the Sensitivity, Specifity, Positive and Negative Predictive Values (PPV, NPV) of the MMC and of the ULBT separately and both tests linked together as a predictors for difficult intubation.

Methods: This is a blind prospective study, we enrolled 174 adult patients who were scheduled for elective surgery undergoing general anesthesia and ETI. They were all subjected to the following assessments: 1.The MMC; 2. The new ULBT classification, defined class III as probable "difficult intubation"; 3. Laryngeal view grading according to Cormacḱs criteria, Grades 3 and 4 defined as "difficult intubation".

Results: The incidence of difficult ETI was 13,8% (n = 19). The specificity was similar on all the tests; The ULBT́s specificity was the highest (99%). The sensibility of the combination of the ULBT with the MMC test was the highest. The PPV of the ULBT was higher than of the MMC, it means if the ULBT grades the patient as a "difficult intubation", it will probably be confirmed with a cormacḱs stage III or IV (Table 2). However, the comparisons of the diagnostic values between the tests, did not reveal any significant differences (p>0,05).

Conclusions: The findings of this study support those of a previos studies of the ULBT. The ULBT seems to be an acceptable option for predicting difficult ETI as a simple and single test. The ULBT and MMC combination enhances the chance to diagnose patients with difficult airway than of the tests employed separately. Because of the easy ULBT and the promising results of this small study we recommend further research with a larger sample.

Table 2. Results from "Hospital Insular" of Spain.

	ULBT	MMC	ULBT+MMC
SENSIBILITY	21%	42%	54%
SPECIFICITY	99%	94%	93%
PPV	83%	53%	57%
NPV	89%	91%	93%

References

1. Khan ZH, Kashfi A, Ebrahimkhani E. A comparison of the upper lip bite test (a simple new technique) with modified Mallampati classification in predicting difficult in endotracheal intubation: a prospective blinded study. *Anesth Analg* 2003; **96**: 595–9.
2. Eberhart LH, Arndt C, Cierpka T, Schanekamp J, Wulf H, Putzke C. The reliability and validity of the upper lip bite test compared with the Mallampati classification to difficult laryngoscopy: an external prospective evaluation. Anesth Analg 2005; **101**: 284–9 Vol. 106, n°5, May 2008.
3. Rodriguez A, Rodriguez E. Prueba de la mordida del labio superior como método predictor de intubación orotraqueal difícil y su comparación con la prueba del Mallampati *Modificado. Rev. Venz Anestesiol*, 2008; **13**(1):47–50.
4. Hester CE, Dietrich SA, Secrest JA, Smith T. A comparison of preoperative airway assessment techniques: The Modified Mallampati and the Upper Lip Bite Test. *AANA Journal, June* 2007; **75** (3): 177–182.

Paper No: 373.00

Comparison of supportive high-frequency ventilation and t-piece for weaning from prolonged mechanical ventilation

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Introduction: Weaning from the respirator is a very important step in the complex of intensive care. On one hand extending the duration of mechanical ventilation (MV) leads to a significant increase in risks for the patient, on the other hand- early weaning can lead to decompensation of respiratory system, premature extubation, which may require reintubation [1]. According to the publications of

some authors and our own observations, the use of supportive high-frequency ventilation (sHFV) is the most safe mode of respiratory support [2,3].

Objectives: To conduct comparative analysis of efficacy and safety of two methods of weaning from the respirator (sHFV and the use of T-piece) in patients who underwent prolonged mechanical ventilation.

Methods: Prospective observational multicenter study, which lasted from August 2007 to January 2010. The study included 99 patients with respiratory failure, who underwent MV, using CMV mode. The first group included 47 patients in the ICU Hospital Nord (Marseille, France,) who underwent prolonged MV (more than 72 hours) and their weaning from the respirator was conducted using the T-piece .The second group included 52 patients in the department of anesthesiology and intensive care Kyiv hospital #17, in whom sHFV technique was used. These patients were conducted volume controlled ventilation, with a gradual transfer to sHFV and the subsequent transition to spontaneous breathing. The parameters sHFV mode were as follows: 150-180 ml tidal volume, respiratory rate 160 to 190 per minute, FiO2 $\geqslant$ 30%, TI/TE = 1.

Results: The incidence of successful weaning in patients of T-piece group was 53.2%, the need for reintubation and resumption of MV occurred in 31.9% patients. The incidence of successful weaning in sHFV group was substantially greater compared to T-piece group and equalled 73.1% ($p = 0.038$). In six patients (11.5%) the efforts to continue MV and weaning were postponed. When using the technique of weaning through sHFV the incidence of VAP was significantly lower. It should be noted that this complication did not occur in any case after the use of weaning through sHFV. Mortality of patients in sHFV and T-Piece groups did not differ significantly and equalled 14.9% and 15.4% respectively ($p = 0.716$). Failure to wean in the application of T-piece required reintubation and ventilation resumption, which led to an increase in the incidence of Ventilator-associated pneumonia (VAP) 4.3 fold. Conclusions The study showed greater efficacy and safety of sHFV for weaning from the respirator in patients who underwent prolonged MV compared with the use of T-piece.

References

1. Boles J-M, Bion J, Connors A, Herridge M, Marsh B, Melot C, Pearl R, Silverman H, Stanchina M, Vieillard-Baron A, Welte T. Weaning from mechanical ventilation *Eur Respir J.* 2007; Vol. **29**: 1033–1056.
2. Klain M, Kala R, Sladen A High-frequency jet ventilation in weaning the ventilator depend patients// *Critical Care Med.* 1984; Vol. **12**No 9: 780–781.
3. Dubrov SO, Glumcher FS Influence of tracheostomy on duration of weaning from mechanical ventilation // *Critical Care* 2009; Vol. **13**, Suppl. 1. P. 7.

Paper No: 439.00

Noninvasive Ventilation, in the Immediate Management of Negative Pressure Pulmonary Edema, a Choice for Ventitatory Support. Case Report

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Introduction: Negative pressure pulmonary edema (NPPE) is a rare but serious anaesthetic complication, arising as a consequence of upper airway obstruction. Postoperative prevalence is 0.1%. We report a case of severe postoperative NPPE.

Methods & Results. A 29-year-old male, underwent an apendicectomy procedure under general anaesthesia. Obstruction of the airway occurred immediately after extubation, made forceful inspiratory efforts without breathing success. Patient became tachy¬cardic and hypoxaemic (SpO2 60–75%). Manual positive pressure mask ventilation with 100% inspired oxygen was made. When finally was awake, started to cough out bright red blood. Bilateral rhonchi were audible by auscultation. We continued treating with 100% oxygen via face mask and furosemide 40 mg., nevertheless, the patient remained hypoxemic. It was transferred to intensive care unit where it was supported overnight with continuous positive airway pressure (CPAP). Oxygen saturation immediately arise to 100%. Chest X-ray showed marked interstitial infiltrates bilaterally, compatible with pulmonary edema. He remained with intermitted CPAP ventilation for 3 days. Radiographic changes diminished gradually and the patient was discharged from the hospital after one week. We concluded that the patient's pulmonary edema was induced by negative intrathoracic pressure, resulting from strong inspiratory efforts in the setting of obstruction of the upper airway.

Conclusions: Facing acute hypoxemia after anaesthesia one should consider aspiration, anaphylaxis or cardiogenic pulmonary edema as origin. Simultaneously one should consider pulmonary edema due to airway obstruction.1.2. Both, the diagnosis of pulmonary edema and an understanding of its underlying pathophysiology have important implications for treatment. NPPE is the result of acute increased transudation due to high negative airway pressure caused by forced inspiratory efforts against the closed glottis. An alternative to intubation is noninvasive respiratory support (NIV).3. Evidence suggests that NIV is an effective strategy to improve oxygenation, and to reduce intubation rates, intensive care unit and hospital lengths of stay, and morbidity and mortality in postoperative patients. The aims of noninvasive respiratory support in the context of NPPE include: to partially compensate for the affected respiratory function by reducing the work of breathing; to improve alveolar recruitment with better gas exchange; and to reduce left ventricular afterload, increasing cardiac output and improving

hemodynamics. Obstruction of the upper airway immediately after extubation and development of NPPE is a potentially fatal complication. Promptly diag¬nose and treatment is the must. The use of non invasive ventilatory support, in the context of NPPE could be an alternative for postoperative management.

References

1. Udeshi A, *et al.* Postobstructive pulmonary edema. *J Crit Care*. 2010 Sep; **25**(3):508. e1-5. Epub 2010 Apr 22.
2. Krodel DJ, et col. Case scenario: acute postoperative negative pressure pulmonary edema. Anesthesiology. 2010 Jul; **113**(1): 200-7.
3. Pelosi P, et col. Noninvasive respiratory support in the perioperative period. *Curr Opin Anaesthesiol*. 2010 Apr; **23**(2):233-8.

Paper No: 513.00

The using of high-frequency oscillatory ventilation in patients with brain injury

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Introduction: Negative effects of mode CMV are well-known. The objective of this study was to determine the intracranial, cardiovascular changes induced by conversion to high-frequency oscillator ventilation (HFOV) from conventional mechanical ventilation (CMV).
Objectives: In this study, 14 patients with severe head injury had cardiovascular and invasive intracranial monitors placed. Middle age has made 36 ± 6 years, GCS 7-9 points; level ICP exceeded 15- 31 mm hg.
Methods: Cerebral haemodynamics was studied by a method of transcranial ultrasonography. We registered: cerebral blood flow velocity (Vm), resistance pial vessels (Pi) and a dilatation's reserve (Ri).
Results: The analysis of parameters central and system haemodynamics at various respiratory support has revealed significant distinctions. At mode CMV-ICP – 23,6 ± 0,7 mm hg; Vm – 51,1 ± 1,4 sm/s; Pi-1,84 ± 0,1; Ri -1,28 ± 0,01; CPP - 67,4 ± 1,3 mm hg and at HFOV -ICP-18,8 ± 2,9 mm hg; Vm 57,8 ± 7,1 sm/s; Pi-1,39 ± 0,2; Ri - 1,36 ± 0,01; CPP - 64,1 ± 6,1 mm hg. Arterial PaC02 increased significantly after converting from CMV to HFOV. Although the PaC02 significantly increased during periods of HFOV, there was no difference in ICP values for both modes of ventilation. The arteriovenous lactate difference (AVDL) was not affected by mode of ventilation; however, it did increase as mean airway pressure was increased. At HFOV authentically lower level of Pi, higher parameter of Ri and lower ICP is marked. That interferes with occurrence of the expressed spasm and an ischemia of a brain. Cerebral perfusion pressure was significantly lower during CMV than during HFOV (CMV: 63,4 ± 3,7 mmHg vs. HFOV: 75,1 ± 5,8mmHg).
Conclusions: The using of ÍFOV as respiratory support at severe traumatic brain injury, on a background of an intracranial hypertension, has doubtless advantages before traditional methods of CMV. Its application provides preservation active autoregulation of brain blood circulation, promotes stabilization of intracranial pressure at lower level.

Paper No: 549.00

Comparison of Propofol and Isoflurane effects on Intraocular Pressure in patients undergoing Lumbar Disc surgery

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Introduction: Post operative blindness is a rare but devastating complication of surgeries specially when performed in prone position, with the incidence of around 0.01% (1). There are some reports about post operative blindness mainly due to hemodynamic alterations affecting optic nerve perfusion rather than direct pressure on the eye globe (2). In prone position IOP is significantly higher than supine position (3).
Objectives: In our survey we studied the effects of Propofol and Isoflurane on IOP of patients in prone position which is to our knowledge the first study performed on the effects of these two drugs on IOP under prone position.
Methods: In this randomized clinical trial, 60 patients who were candidates for Lumbar disk surgery were randomely assigned into two groups: Propofol and Isoflurane. Intraocular Pressure was measured before and after induction of anesthesia in supine position, immediately after prone positioning of the patient and at the end of operation in prone position and also after turning the patients back to supine position. Mean arterial pressure, systolic and diastolic blood pressure and heart rates were all assessed. Finally, the data were evaluated using T test, Chi-square test and Generalized Estimating Equations.
Result: The baseline Mean Intraocular Pressure of awake patients in supine position in Isoflurane and Propofol groups were 15.8 ± 3.1 and 18.2 ± 5.4 mmHg respectively, and at the end of operation Intraocular Pressure in prone position was changed to 18 ± 5.8 and 17.2 ± 4.9 mmHg respectively. ($P = 0.024$). According to mixed analysis, mean arterial pressure, systolic blood pressure, diastolic blood pressure, end tidal Co2 and heart rate did not show statistically significant changes between the two groups. ($P < 0.05$).

Conclusion: Propofol better controls the Intraocular Pressure than Isoflurane in prone position with no significant difference in hemodynamic responses.

References

1. Warner ME, warner MA, Garrity JA, *et al.* The frequency of postoperative vision loss. *Anesth Anal* .2001; **93**: 1417–21.
2. Cheng MA, Sigurdson W, Tempelhoff R, Lauryssen C. Visual loss after spine surgery: a survey. *Neurosurgery* 2000 **46**: 625–31.
3. Hunt K, Bajekal R, Calder I, Meacher R, Eliahoo J, Acheson JF. Changes in intraocular pressure in anesthetized prone patients. *J Neurosurg Anesthesiol* 2004; **16** (4):287–90.

Paper No: 659.00

Intraoperative determination of respiratory mechanics and oxygenation in morbid obese patients undergoing bariatric surgery

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Background: Obesity may affect pulmonary function in a number of ways as decreased compliance (Csr) and diminished lung volumes and capacities mainly functional residual capacity (FRC).
Objectives: To describe the behavior and relationships between Intraoperative respiratory mechanics (Csr and FRC) and oxygenation (PaO2/FiO2) in morbid obese patients undergoing laparoscopic bariatric surgery.
Methods: Fourteen patients with BMI $\geqslant 45 \pm 8$ kg/m2, scheduled for laparoscopic bariatric surgery were included in this prospective study. After 5 min of preoxygenation (CPAP = 10 cmH2O, FiO2 0.8) in reverse TLP (30°), intravenous anesthesia was induced and maintained. Volume controlled ventilation was set up (ventilator EngstrÖm CS®GE): VT = 8 ml•kg-1 predicted body weight (PBW); RR = 12; PEEP = 10 cmH2O; FiO2 0.5. A recruitment maneuver (RM) with incremental PEEP and pressure control ventilation (PCV) was applied 15 min after pneumoperitoneum set up (45° TLP). Optimal PEEP was calculated and established. After pneumoperitoneum withdrawal (30° reverse TLP) PEEP was set up again at 10 cmH2O. Respiratory mechanics (dynamic respiratory system compliance (Csr) and FRC) were recorded using the ventilator tools at 4 time points: 5 min. after induction (T1); 15 min. after pneumoperitoneum set up (T2); 15 min after RM-PEEP optimization (T3); and 15 min. after pneumoperitoneum withdrawal (T4). Absolute FRC was measured with a nitrogen wash-out/wash-in technique. PaO2/FiO2 ratio was determined at T1, T3 and T4. Wilcoxon tests were used for intragroup comparisons (SPSS).

Results: Variable T1 T2 T3 T4 FRC $1689{,}80 \pm 472$ $869{,}31 \pm 236$ $1629{,}16 \pm 271$ $1841{,}24 \pm 587$ Csr $50{,}25 \pm 8$ $38{,}50 \pm 6$ $45{,}69 \pm 7$ $60{,}50 \pm 12$ PaO2/FiO2 $373{,}50 \pm 169$ —$347{,}81 \pm 114$ $475{,}35 \pm 104$ Mean $\pm$SD at different time points. Test statistics(a) Asymp. Sig. (2-tailed) CsrT2-CsrT1 $p = 0{,}04$ CsrT3-CsrT2 $p = 0{,}02$ CsrT3-CsrT1 $p = 0{,}60$ CsrT4-CsrT1 $p = 0{,}10$ FRCT2-FRCT1 $p = 0{,}03$ FRCT3-FRCT2 $p = 0{,}03$ FRCT3-FRCT1 $p = 0{,}505$ FRCT4-FRCT1 $p = 0{,}182$ PaO2/FiO2T3-PaO2/FiO2T1 $p = 0{,}510$ PaO2/FiO2T4-PaO2/FiO2T1 $p = 0{,}026$ (a) Wilcoxon signed ranks tests After performing the pneumoperitoneum (T2) CRF and Csr decrease significantly respect to T1. Significant improvement was observed in respiratory mechanics in T3 respect to T2. The recruitment maneuvers improved respiratory mechanics and PaO2/FiO2 equaling values of FRC and Csr in T3 with T1. After pneumoperitoneum removal Csr and PaO2/FiO2 were even better than prior to pneumoperitoneum.
Conclusion: These data suggest that, in these patients, FRC and Csr decrease significantly after pneumoperitoneum, and that recruitment maneuver followed by individually adjusted optimal PEEP allowed complete recovery of respiratory mechanics as well as oxygenation after pneumoperitoneum.

References

1. McClean KM, Kee F, Young IS, *et al.* Obesity and the lung: 1 Epidemiology. *Thorax*2008; **63**: 649–54.
2. Pelosi P, Croci M, Ravagnan I, *et al.* The effects of body mass on lung volumes, respiratory mechanics, and gas exchange during general anesthesia. *Anesth Analg*1998; **87**: 654–60.
3. Lachmann B. Open up the lung and keep the lung open. *Intensive Care Med*1992; **18**: 319–21.
4. Tusman G, Böhm SH, Vazquez de Anda GF, *et al.* 'Alveolar recruitment strategy' improves arterial oxygenation during general anaesthesia. *Br J Anaesth*1999; **82**: 8–13.
5. Whalen FX, Gajic O, Thompson GB, *et al.* The effects of the alveolar recruitment maneuver and positive end-expiratory pressure on arterial oxygenation during laparoscopic bariatric surgery. *Anesth Analg* 2006; **102**: 298–305. Erratum in: Anesth Analg2006;102: 881.

Paper No: 660.00

Intraoperative comparison of continuous vs. intermittent subglottic suctioning with evac endotracheal tube

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Introduction: Ventilator-associated pneumonia is a common complication in mechanically ventilated patients. The incidence in the intensive care unit is 5 to 10 cases per 1000 ventilator days. Subglottic secretion drainage has been shown to decrease the incidence of ventilator-associated pneumonia

by nearly 50%.(1) Various suctioning regimens of these secretions have been found to decrease the incidence of nosocomial pneumonia by 9% to 13% as compared to no suctioning.(2,3) Neither optimal suction regimens nor the characterization of the content of subglottic secretions has been established in mechanically ventilated patients in an intraoperative setting. Endotracheal tubes may act as a conduit for bacteria to enter the lungs by pooling and leakage of secretions around the endotracheal tube cuff.(4) Developing a better understanding of the content of these secretions may help strengthen the relationship between intubation, pneumonia and other respiratory complications.

Objectives:

- To characterize the pH, volume, amylase, and microorganism content of subglottic secretions collected on top of the cuff during intubation for surgery
- To determine the optimal timing interval for suctioning fluid from the cuff during surgery

Methods. After IRB approval and informed consent, 48 patients were intubated with the Taperguard EVAC TM endotracheal tube and randomized to either continuous (20 mmHg) or intermittent (100-150 mmHg for 15 seconds with an 8 second pause) suctioning schemes. The patients were randomized in a 1:1 ratio to the two suctioning schemes and equally distributed by gender (male, female) and age ($<$ 50 years, $\geqslant$ 50 years). Specimens were collected in a Lukens trap every 30 minutes for the duration of surgery. All intubation times were greater than two hours. Samples were analyzed for pH, volume, amylase, and microorganisms.

Results: Thirty-five patients (73%) had secretions cultured, of which 48% of those patients had pathogenic microorganisms. Pathogenic microorganisms comprised 15% of all microorganisms cultured. All data were analyzed using a univariate ANOVA. No significant difference was found for pH, volume and amylase between the two different suctioning schemes, gender or age.

Conclusions: The Taperguard EVAC TM endotracheal tube allowed secretions to be collected independent of suction scheme, gender, and age in intraoperative patients. These secretions frequently contain pathogens that may contribute to postoperative pneumonia and other respiratory complications.

References

1. Dezfulian C, Shojania K, Collard HR, Kim HM, Matthay MA, Saint S (2005). Subglottic secretion drainage for preventing ventilator-associated pneumonia: a meta-analysis. *Am J Med*. **118**(1):11–18.
2. Smulders K, van der Hoeven H, Weers-Pothoff I, Vandenbroucke-Grauls C (2002). A randomized clinical trial of intermittent subglottic secretion drainage in patients receiving mechanical ventilation. *Chest*. **121**(3):858–862.
3. Mahul P, Auboyer C, Jospe R, *et al.* (1992). Prevention of nosocomial pneumonia in intubated patients: respective role of mechanical subglottic secretions drainage and stress ulcer prophylaxis. *Intensive Care Med*. **18**(1):20–25.
4. Chastre J, Fagon JY (2002). Ventilator-associated pneumonia. *Am J Respir Crit Care Med*. **165**: 867–903.

Paper No: 666.00

Exponential increase in Interleukin-6 plasma level after reperfusion during living-donor lobar lung transplantation with cardiopulmonary bypass

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Introduction: Ischemia-reperfusion lung injury occurs following lung transplantation, and is a major post-operative fatal complication. Cytokines and polymorphonuclear elastase (PMN-E) have been shown to play an important role in promoting and enhancing inflammation. Living-donor lobar lung transplantation (LDLLT) must be performed with cardiopulmonary bypass (CPB), whitch exacerbates inflammatory response. The reperfusion of grafts after CPB may deteriorate ischemia-reperfusion injury even further. Inflammatory mediators may play a critical role in the modulation of reperfusion injury during and after CPB.

Objectives: The purpose of this study is to measure plasma concentrations of proinflammatory cytokines and PMN-E in patients undergoing LDLLT surgery with CPB.

Methods: Following Institutional Review Board approval and written informed consent, sixteen patients scheduled for LDLLT using CPB were enrolled. Anesthesia was maintained with high dose fentanyl. Patients were treated with methylprednisolone (30 mg/kg) IV during CPB just before reperfusion of donor lobes. Arterial blood sample, tumor necrosis factor alpha (TNF-alpha), inerleukin-6 (IL-6), and PM-E cocentrations were collected at 3 time points, before CPB, during CPB (30 minutes before reperfusion), and 2 hour after CPB (after LDLLT procedure). Data were analyzed using repeated measures ANOVA. Mean}SD are presented, and a p-value less than 0.05 was considered significant.

Results: CPB time was 278}68 minutes. The ischemic time of the right and left graft was 154}38 and 107}25 minutes, respectively. LDLLT patients demonstrated significant elevations of IL-6 and PMN-E during and after CPB. IL-6 production increased significantly after CPB (Table 1).

Table 1

	Before CPB	During CPB	After CPB
IL-6 (pg/ml)	11.5}21.8	91.4}108.7*	326.7}147.1*#
TNF-alpha (pg/ml)	1.54}0.97	2.99}4.48	2.44}1.98
PMN-E (μg/L)	83.1}38.0	228.5}98.0*	221.8}61.6

**p $<$ 0.05 vs beforeCPB, #p $<$ 0.05 vs during CPB.

Discussion: Various ischemic time may influence release of specific cytokines in cadaveric lung transplantation. This LDLLT

study is advantageous in relatively constant ischemic time. In this study population, ischemic and CPB time did not correlate with IL-6 and PMN-E levels. Our data suggest that production of inflammatory cytokines and mediators are triggered by CPB and that production of IL-6 is accelerated by reperfusion of lung grafts after CPB. The administration of methylprednisolone before reperfusion was not able to inhibit IL-6 production.
Conclusion: IL-6 and PMN-E increased during CPB and IL-6 increased additionally after reperfusion. In order to prevent ischemia-reperfusion lung injury, it may be beneficial to reduce IL-6 levels during LDLLT with CPB.

Paper No: 824.00

Preservation of the Spontaneous Ventilation during a Bronchoscopic Resection of a Typical Bronchial Carcinoid Tumor: Case Report

Sergio Andres, **Jaramillo Valencia**, **Fredy Ariza** and **Luis Angel Betancur**

Background: Typical bronchial carcinoid tumors (TBCT) are infrequent malignancies corresponding to 1-2% of lung tumors. Typically, TBCT are not associated with smoking and affect big caliber bronchi with subsequent airway obstruction and atelectasia. Surgical treatment for these tumors is ideally done by an endobronchial approach. Awrong anesthetic management could trigger serious respiratory complications during procedure.
Methods: We describe the anesthetic management for a 42-year-old man with multiple polipoid tumors located in bronchia lumen who consult for respiratory failure. Image studies suggested TBCT. Additionally, we review the anesthetic considerations for these cases.
Results: A rigid bronchoscopy was initially done in this patient under a pure inhaled-based general anesthesia with sevoflurane (2 MACs) and preservation of spontaneous ventilation. Additional instilled 2% lidocaine with epinephrine and cold saline helped to control bleeding during the endoscopic resection of some of the polipoid masses. Suddenly, ventilation of the patient turned difficult due to a partial obstruction by pieces of the tumor and bleeding, forcing to change anesthetics administration to a TIVA technique until completion of the procedure without other incidents.
Conclusions: Surgical resection of endobronquial tumors like TBCT requires an anesthetic management based in drugs that preserve spontaneous ventilation, especially when risk of acute obstruction of the airway due to migration of the excised malignant tissue remains high. Additionally, neurovegetative and hemodynamic protection are permanent concerns during all the time of endoscopic resection. Rigid bronchoscopy ensues ideal conditions for the anesthetic delivery when an inhaled-based anesthesia is chosen although an intravenous technique is a valid alternative for these endoscopic procedures.

Reference

1. Kulke MH, Mayer RJ. Carcinoid tumors. *N Engl J Med*. 1999; **340**: 858–868.
2. Erdo?an Cetinkaya, Gülfidan Aras. Treatment of endoluminal typical carcinoid tumor with bronchoscopic techniques. *Tüberküloz ve Toraks Dergisi* 2009; **57**(4):427–430
3. Roger Marks, Leigh Tanner. Management of a tumor in the distal trachea while maintaining spontaneous ventilation. *J Anesth* (2010) **24**:932–934.
4. Nick Antoniades, Christopher Worsnop. Topical lidocaine through the bronchoscope reduces cough rate during bronchoscopy. *R Respirology* (2009) **14**:873–876.
5. Jeff Schnader, Jim Harrell. Clinical Conference on Management Dilemmas: Bronchiectasis and Endobronchial Polyps. *Chest* 2002; **121**:637–643.

Paper No: 838.00

Comparision of thiopentone and propofol for induction of ga in asthmatic patients on treatment and incidence of bronchospasm and laryngospasm

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Introduction: Asthma is a condition of increased sensitivity of bronchial tree. Asthmatics are more prone for bronchospasm under general anaesthesia than general population. Even though on treatment,bronchospasm and laryngospasm may occur in some patients. Here the induction agent thiopentone is more prone for bronchospasm and laryngospasm. It is compared with propofol in this study
Objectives: The induction agent thiopentone is compared with propofol in this study. Asthmatic patients were kept on bronchodilator treatment. Incidence of bronchospasm and laryngospasm were observed.
Methods: Hospital ethics committee approval was taken and informed consent was obtained from patients. Both males and females were included. Age ranged from 25 to 73 years. Patients requiring elective surgery have undergone routine investigations and Lung function tests and were kept on bronchodilator therapy and improved effects were noted. They were divided into 2 groups of 65 each. After improvement patient was taken to operating table, IV line was started and the following monitors were connected: pulse oxymeter, NIBP,ECG,ETCO2.They were randomly anaesthetized:group 1 with thiopentone, group 2 with propofol. When bronchospasm and laryngospasm occured,they were treated adequately with IPPV,volatile anaesthetics, nebulisation with bronchodilators and muscle relaxants.
Results: In both groups male:female ratio was similar. Average age was similar. Average weight was similar.

Incidence of bronchospasm and laryngospasm in thiopentone group was significantly higher than propofol group.
Discussion: Bronchospasm is one of the complication under general anaesthesia. Asthmatic patients are more prone for bronchospasm than general population. In this study, asthmatic patients requiring elective surgery were kept on bronchodilator therapy and symptoms controlled. They were divided into 2 groups. First group was given thiopentone and incidence of brnchospasm and laryngospasm was significantly higher than in second group,in which propofol gave some protection against bronchospasm.
Conclusion: Bronchodilator therapy in asthmatics mitigates or avoids bronchospasm. Propofol reduces the chances of bronchospasm when used as induction agent. With thiopentone there is increased incidence of bronchospasm which is statistically significant.

Reference

1. Mckeating K, Bali IM, Dundee JW. The effects of thiopentone and propofol on upper airway integrity.*Anaesthesia* 1988; **43**: p638-40.

Paper No: 874.00

Predictive value of airway assessments for difficult intubation in thyroid surgery

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Introduction: Anaesthesia for thyroid surgery is generally considered challenging, with potential difficulties in airway management and subsequent intubation posed by the presence of a neck mass and malignancy. Airway physical examination prior to anaesthesia has been recommended [1,2], although there is no clear evidence which of the assessments provide strongest predictive value, particularly for thyroid surgery.
Objectives: To ascertain the incidence of difficult airway and intubation in thyroid surgery, and the predictive value of preoperative airway assessment
Methods: A prospective observational study was conducted of all patients undergoing thyroid surgery at the Hammersmith Hospital in 2011 (approved by the Chair of the Local Clinical Ethics Committee). The investigator obtained informed consent on the day of surgery. Data collected included a full airway assessment as well as patient demographic and clinically relevant data. The anaesthetising clinicians, who were blinded to these findings, documented difficulties in airway management and intubation, which was collected by the investigator along with size and pathology of goitre.
Results: A total of 67 consecutive patients were recruited. 35 patients had a hemithyroidectomy, and 32 patients had a total thyroidectomy. Laryngoscopy View: Grade I Grade II Grade III Number: 43 16 8 Malignancy: 7 5 3 Mallampati 1/2/3 29/10/4 6/6/4 4/4/0 Body Weight/kg (mean $\pm$ SD): 72.7 ± 13.4 78.5 ± 12.2 66 ± 25.0 Body Mass Index (mean $\pm$ SD): 27.6 ± 5.5 29.9 ± 4.0 30.1 ± 7.6 Neck Circum/cm (mean $\pm$ SD): 36.3 ± 3.2 39.3 ± 4.0 40.0 ± 8.0 ThyromentalDistance:Height (mean $\pm$ SD): 5.31 ± 0.91 5.30 ± 1.294 56 ± 0.55 Goitre Weight/g (mean $\pm$ SD): 56.3 ± 56 71 ± 91.8 127.2 ± 135.2 Upper Lip Bite Test Class I/II/III: 13/30/0 4/8/0 1/6/1 Jaw Protrusion A/B/C: 38/6/0 14/2/0 8/0/0.
Conclusions: The incidence of difficult intubation (defined as Cormack and Lehane Grade III on direct laryngoscopy) was 12%, similar to documented results from retrospective studies in thyroid surgery[3,4], but greater than that in "general anaesthesia"[5]. There were no grade IV laryngoscopies. Furthermore none of the patients were difficult "airways" with bag & mask ventilation described as easy in 82% and manageable in 18%. When comparing difficult (Grade III) and easy (Grade I) intubation grades, neck circumference (p value 0.028), thyromental distance: height ratio (p value 0.03) and goitre weight (p value 0.015) appeared stronger predictors of potential difficulty compared to the more commonly assessed Mallampati grade, presence of malignancy and relation of maxillary to mandibular incisors (upper lip bite test/jaw protrusion). In conclusion, although potentially challenging, there are predictive factors unique to airway management in thyroid surgery.

References

1. Raising the Standard: A compendium of audit recipes (Second edition 2006). Royal College of Anaesthetists.
2. American Society of Anaesthesiologists Task Force on the Management of the Difficult Airway. Practice guidelines for the management of the difficult airway: an updated report by the American Society of Anaesthesiologists Task Force on the Management of the Difficult Airway. *Anaesthesiology* 2003; **98**: 1269–77.
3. Adnet F, Borron SW *et al.* The intubation difficulty scale (IDS): proposal and evaluation of a new score characterising the complexity of endotracheal intubation. *Anaesthesiology* 1997; **87**: 1290–7.
4. Amathieu R, Smail N *et al.* Difficult intubation in thyroid surgery: Myth or Reality? *Anaesthesia & Analgesia* 2006; **103**: 465–8.
5. Adnet F, Racine SX *et al.* A survey of tracheal intubation difficulty in the operating room: a prospective observational study. *Acta Anaesthesiol Scand* 2001; **45**: 327–32.

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Incidence of postoperative atelectasis or pneumonia according to anesthesia technique

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Introduction: The postoperative atelectasis and pneumonia are most frequently observed after abdominal surgery with inhalatory general anesthesia increases DAaO2 and Qs/Qt.
Objectives: To demostrate that the incidence of postoperative pneumonia or atelectasis and DAaO2 and Qs/Qt transoperative changes are less anesthesia with propofol than with halothane. Methods. It was designed a controlled clinical trial and prior authorization of the Local Committee for research and informed consent of patients, studied 114 subjects undergoing abdominal surgery, randomly divided into: grupo1 = Intravenous general anesthesia with Propofol and grupo2 = inhalatory general anesthesia with halothane. After oxygenation took blood samples to determine the DAaO2 and Qs/Qt. We assessed the preoperative pulmonary status with chest x-rays that are repeated 24/48/72 hours/sixth day, interpreted by two radiologists blinded experimental setting.
Results: The groups were similar in age, sex, weight, anesthetic time and type of surgery. Propofol group consisting of 36 women and 21 men, DAa02 in Basal Torr (B) = 256. 8 ± 68. 1, Transanesthetic (TA) = 258. 4 ± 72. 2 and post-anesthetic (PA) = 226. 3 ± 70. 9. Qs/Qt: B = 19. 7 ± 6. 5, TA = 19. 0 ± 5. 4 and PA = 14. 5 ± 5. 8. 28% Had pulmonary complication, 8 pneumonia and atelectasis 13. The halothane group with 31mujeres and 26 men DAaO2 B = 271. 8 ± 74. 6, TA = 282 ± 66. 4, PA = 249. 2 ± 73. 7. Qs/Qt B = 19. 5 ± 6. 5, TA = 22. 6 ± 8. 6, PA = 19. 0 ± 10. 1. 60% Attended with pulmonary complication 20 pneumonias and 25 atelectasis. We calculated a relative risk = 3. 3 (95% CI 1.2 to 9.3) to pneumonia and 2.6 (IC_95%_1.17_a_6.5) for atelectasis.
Conclusions: The incidence of postoperative pneumonia and atelectasis was higher in the group managed with halothane.

References

1. Pedersen T, Eliasen K, Henriksen E. A prospective study of risk factors and cardiopulmonary complications associated with anaesthe¬sia and surgery: risk indicators of cardiopulmonary morbidity. *Acta Anaesthesiol Scand* 1990; **34**: 144–55.
2. Hall CJ, Tarala AR, Hall LJ, Mander J. A Multivariate analysis of the risk of pulmonary complications after laparotomy. *Chest* 1991; **4**: 923–926.
3. Kimberly S, Ephgrave , Kleiman WR, Pharm D, Pfaller M Booth B, Werkmeister L, Young S. Postoperative pneumonia: A prospective study of risk factors and morbidity. *Surgery* 1993; **114**: 815–20.

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Effects of superimposed high frequency jet ventilation on oxygenation and carbondioxide retention in rigid bronchoscopy

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Introduction: Hypoxia and hypercapnia are important anesthetic problems during rigid bronchoscopy with the conventional ventilation. Carbondioxide retention can be prevented during Superimposed High Frequency Jet Ventilation (SHFJV), and therefore this ventilation mode can be applied for an extended period, while oxygenation is achieved through simultaneous use of normal and high frequency ventilation models (1-4).
Objective: The aim of this study is to investigate the effects of tubeless superimposed high frequency jet ventilation (SHFJV) on oxygenation and carbondioxide retention in rigid bronchoscopy. Methods: Following Institutional Ethical Committee approval, 40 ASA I-II patients were randomly assigned to two equal groups. After anesthesia induction with lidocaine 1 mg/kg iv, propofol 2-2.5 mg/kg, rocuronium 0.6 mg/kg, remifentanil 0.2 μg/kg/min, anesthesia was maintained using total intravenous anesthesia with propofol 4-10 mg/kg/h and remifentanil 0.05-0.2 μg/kg/min. Group I was ventilated with conventional ventilation, and respiration was set at Vt: 8 ml/kg, 12 breath/min, I:E ratio = 1:2, FiO2: 0.6. Group II was ventilated with SHFJV, normal frequency unit was set at 12 breath/min, I:E ratio = 1:2, P:1 bar, and high frequency unit at 600 breath/min, I:E ratio = 1:2 and P:1 bar. Heart rate (HR), systolic arterial pressure (SAP), diastolic arterial pressure (DAP), mean arterial pressure, peripheric oxygen saturation (SpO2), end tidal carbondioxide (ETCO2) levels, PaO2, PaCO2, pH, SO2 and HCO3 values were recorded at onset (control), induction, before, during and after bronchoscopy and postoperative first hour. Data were analysed with Student's t, Chi Squared, paired t and repeated measurement two way variance analyses tests. Statistical significance was considered as $p < 0.05$.
Results: There was no significant difference in DAP, MAP and HR values between the two groups. SAP was higher at the 10th min in Group I ($p < 0.05$). SpO2 displayed high values in SHFJV group at each recording, while no significant difference was observed for SpO2 and PaO2 between the two groups. ETCO2 and PaCO2 values were significantly lower in the SHFJV group between 5-30 mins of bronchoscopy and after bronchoscopy ($p < 0.05$). Although there was no significant difference in PaCO2 values between the two groups, it displayed lower values in the SHFJV group at each recording. In Group I, ETCO2 and PaCO2 values increased continuously during bronchoscopy ($p < 0.05$), and reached their highest values (ETCO2: 41.10 ± 8.32 mmHg and PaCO2: 63.80 ± 10.59 mmHg) after bronchoscopy ($p < 0.05$).
Conclusions: SHFJV should be preferred during rigid bronchoscopy, due to the advantage of achieving more effective CO2 elimination, as well as hemodynamic stability and sufficient oxygenation.

References

1. Aloy A, Schachner M, Cancura W. Tubeless translaryngeal superimposed jet ventilation. Eur Arch Otorhinolaryngol. 1991; **248**: 475–8.
2. Aloy A, Schachner M, Spiss CK, Cancura W. Tube-free translaryngeal superposed jet ventilation. Anaesthesist. 1990; **39:** 493–8.

3. Kraincuk P, Körmöczi G, Prokop M, Ihra G, Aloy A. Alveolar recruitment of atelectasis under combined high-frequency jet ventilation: a computed tomography study. Intensive Care Med. 2003; **29**: 1265–72.
4. Rezaie-Majd A, Bigenzahn W, Denk D-M, Burian M, Kornfehl J, Grasl M, *et al.* Superimposed high-frequency jet ventilation (SHFJV) for endoscopic laryngotracheal surgery in more than 1500 patient. *British Journal of Anaesthesia* 2006; **96**: 650–9.

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Preoperative ph predicts post-single lung transplant ventilation improvement in copd patients

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Introduction: Patients with diagnosis of advanced chronic obstructive pulmonary disease (COPD) who undergo off-pump single lung transplantation (SLT) are at high risk of suffering volume or pressure related damage of the native lung during selective ventilation. Permissive hypercapnia (PaCO2 between 50 and 100 mmHg, and pH ¡Ý 7.20) is a preventive alternative in selective lung ventilation, although it leads to transient alveolar hypoventilation.

Objectives: The aim was to identify intraoperative predictors in arterial blood gases (ABG) samples of post-transplant alveolar ventilation improvement in single lung transplant (SLT) COPD recipients.

Material and Methods. Between June/1994 and July/2011, 119 SLT were performed at our hospital. Of these, 64 COPD patients who received off-pump SLT were included in the study. All patients were in NYHA functional class IV The ventilatory modality during the anaesthetic procedure was controlled volume with permissive hypercapnia. ABG samples were obtained after anaesthetic induction (baseline) and at the end of the procedure (final). Variables were compared using paired t test. A linear correlation was performed between baseline pH and ¦¤PaCO2 (PaCO2 basal ¨C PaCO2 final). Results: Basal and Final measurements of ABG (mean ¡À SD) were compared in the following table:

Baseline	Final	p value
PaCO2 (mmHg)	60.5	
¡À	11.6	50.6
¡À	10.6	<0.01 pH 7.32
¡À	0.06	7.34
¡À	0.09<0.05	
HCO3 (mM)	29.2	
¡À	5.6	27.3
¡À	5.3	<0.05
PaO2 (mmHg)	370	
¡À	131	391
¡À	133	
NS BE (mM)	4.1	
¡À	4.4	1.9
¡À	4.1	<0.01

The following linear adjust was obtained: ¦¤PaCO2 = 117 . pH baseline¨C 866 ($p < 0.001$; $r = 0.6$).

Conclusions. PaCO2, HCO3 and base excess (BE) were immediately improved by the procedure. A linear correlation was identified between baseline pH and ¦¤PaCO2. Pre transplant pH was an independent predictor of post-transplant alveolar ventilation improvement in this study.

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