

ABSTRACTS

Comparison of xenon with propofol for supplementary general anaesthesia for knee replacement: a randomized study

Rasmussen, L.S., Schmehl, W., Jakobsson, J., Br. J. Anaesth. 97(2) 154-159.

BACKGROUND: Xenon anaesthesia is associated with rapid recovery and may also offer protection against neuronal damage. The aim of this study was to compare xenon with propofol for supplementary general anaesthesia in patients undergoing knee replacement in spinal anaesthesia. There was no significant difference between the groups in blood pressure, heart rate, ventilatory frequency or end-tidal carbon dioxide concentration. No difference could be detected in cognitive function, which may be attributed to insufficient sample-size rather than the absence of a true difference.

CONCLUSIONS: Xenon was well tolerated for supplementary general anaesthesia in elderly spontaneously breathing patients but supplementation may be necessary. Compared with propofol, emergence was faster with xenon. A larger sample-size is needed if cognitive function is to be addressed.

Blood glucose concentration profile after 10 mg dexamethasone in non-diabetic and type 2 diabetic patients undergoing abdominal surgery

Hans, P., Vanthuyne, A., Dewandre, P., Y. Brichant, J. F. Bonhomme, V., Br. J. Anaesth. 97(2) 164-170.

BACKGROUND: Dexamethasone prevents postoperative nausea and vomiting but may increase blood glucose. We compared blood glucose concentrations after dexamethasone in non-diabetic and type 2 diabetic patients undergoing surgery and looked for any association with preoperative glycosylated haemoglobin [HbA (1c)] and BMI. There was a significant correlation between the maximum concentrations and BMI ($R^2=0.21$) or HbA (1c) ($R^2=0.26$). Logistic regression analysis revealed that the higher the BMI, the lower the HbA (1c) threshold associated with an increased probability (>0.5) of observing blood glucose levels higher than 8.33 mmol litre⁻¹ during 240 min after dexamethasone administration. Similarly, the higher the HbA (1c), the lower the BMI threshold associated with the same probability.

CONCLUSIONS: After 10 mg dexamethasone, blood glucose levels increase in non-diabetic and type 2 diabetic patients undergoing abdominal surgery. Poorly controlled diabetes and severe obesity can influence the development of hyperglycaemia.

A comparison of the SNAP IITM and BIS XPTM indices

during sevoflurane and nitrous oxide anaesthesia at 1 and 1.5 MAC and at awakening

Wong, C. A., Fragen, R. J., Fitzgerald, P., McCarthy, R. J., Br. J. Anaesth. 97(2) 181-186.

BACKGROUND: Monitoring level of consciousness during anaesthesia, with the ability to predict the intentional or unintentional return to consciousness, is desirable. The purpose of this study was to compare two processed electroencephalographic depth of anaesthesia monitors (SNAP IITM and BIS XPTM) during sevoflurane and sevoflurane/nitrous oxide anaesthesia.

CONCLUSIONS: The SNAP index tracks loss of consciousness and emergence from sevoflurane and sevoflurane/nitrous oxide anaesthesia. There is significant bias between the SNAP and BIS indices and therefore, the indices are not interchangeable. The SNAP index returns to baseline before awakening, whereas the BIS index remains below baseline at awakening, suggesting that the SNAP index may be more sensitive to unintentional awareness.

Epidural catheter placement in children: comparing a novel approach using ultrasound guidance and a standard loss-of-resistance technique

Willschke, H., Marhofer, P., Bosenberg, A., Johnston, S., Wanzel, O., Sitzwohl, C., Kettner, S., Kapral, S., Br. J. Anaesth. 97(2) 200-207.

BACKGROUND: We report a prospective, randomized study to evaluate ultrasound guidance for epidural catheter placement in children 0-6 yr of age.

METHODS: Epidural catheters were placed at lumbar or thoracic cord levels in 64 children undergoing major surgery, using either ultrasonography or loss-of-resistance (LOR) for guidance. Using a 5-10 MHz linear ultrasound probe, the neuraxial structures were identified, the skin-epidural depth and epidural space was measured, the advancing epidural catheter visualized, and the spread of local anaesthetic verifying catheter position was confirmed. Epidural placement procedures were analysed for bone contacts and speed of execution. Children under 6 months were analysed separately. Results. Epidural placement involved bone contacts in 17% of children in the ultrasound group and 71% of children in the LOR group ($P < 0.0001$). Epidurals were executed more swiftly in the ultrasound group [162 (75) s vs 234 (138) s; $P < 0.01$]. Children under 6 months revealed a 0.9 correlation between skin-epidural depth and body weight.

CONCLUSIONS: Ultrasonography is a useful aid to verify epidural placement of local anaesthetic agents and epidural catheters in children. Advantages include a reduction in bone contacts,

faster epidural placement, direct visualization of neuraxial structures and the spread of local anaesthetic inside the epidural space. Ultrasound guidance requires additional training and good manual skills, and should only be used once experience in ultrasound-guided techniques of regional anaesthesia has been acquired.

Absorption of carbon dioxide during laparoscopy in children measured using a novel mass spectrometric technique

Pacilli, M. Pierro, A. Kingsley, C. Curry, J. I. Herod, J. Eaton, S., Br. J. Anaesth. 97(2) 215-219.

BACKGROUND: Carbon dioxide (CO₂) is absorbed during pneumoperitoneum and may cause adverse haemodynamic effects. The aim of this study was to measure the elimination of exogenous CO₂ during laparoscopy in children.

CONCLUSION: After 10 min of laparoscopy 10-20% of expired CO₂ derives from the exogenous CO₂. CO₂ absorption can be measured using a simple mass spectrometric technique.

Ultrasound-guided blocks of the ilioinguinal and iliohypogastric nerve: accuracy of a selective new technique confirmed by anatomical dissection

Eichenberger, U. Greher, M. Kirchmair, L. Curatolo, M. Moriggl, B., Br. J. Anaesth. 97(2) 238-243.

BACKGROUND: Ilioinguinal and iliohypogastric nerve blocks may be used in the diagnosis of chronic groin pain or for analgesia for hernia repair. This study describes a new ultrasound-guided approach to these nerves and determines its accuracy using anatomical dissection control.

METHODS: After having tested the new method in a pilot cadaver, 10 additional embalmed cadavers were used to perform 37 ultrasound-guided blocks of the ilioinguinal and iliohypogastric nerve. After injection of 0.1 ml of dye the cadavers were dissected to evaluate needle position and colouring of the nerves. Results. Thirty-three of the thirty-seven needle tips were located at the exact target point, in or directly at the ilioinguinal or iliohypogastric nerve. In all these cases the targeted nerve was coloured entirely. In two of the remaining four cases parts of the nerves were coloured. This corresponds to a simulated block success rate of 95%. In contrast to the standard 'blind' techniques of inguinal nerve blocks we visualized and targeted the nerves 5 cm cranial and posterior to the anterior superior iliac spine. The median diameters of the nerves measured by ultrasound were: ilioinguinal 3.0x1.6 mm, and iliohypogastric 2.9x1.6 mm. The median distance of the ilioinguinal nerve to the iliac bone was 6.0 mm and the distance between the two nerves was 10.4 mm.

CONCLUSIONS: The anatomical dissections confirmed that our new ultrasound-guided approach to the ilioinguinal and iliohypogastric nerve is accurate. Ultrasound could become an attractive alternative to the 'blind' standard techniques of ilioin-

guinal and iliohypogastric nerve block in pain medicine and anaesthetic practice.

Ultrasonography-guided rectus sheath block in paediatric anaesthesia—a new approach to an old technique

Willschke, H. Bosenberg, A. Marhofer, P. Johnston, S. Kettner, S. C. Wanzel, O. Kapral, S., Br. J. Anaesth. 97(2) 244-249.

BACKGROUND: The purpose of this study was an anatomical and clinical evaluation of ultrasonography-guided rectus sheath blocks in children.

METHOD: A total of 30 children were included in the sonographic part of the study. The depth of the anterior and posterior rectus sheath was evaluated with a portable SonSite 180 plus ultrasound machine and a 5-10 MHz linear probe. In total, 20 consecutive children undergoing umbilical hernia repair were included in the clinical part of this study. After induction of general anaesthesia children received a rectus sheath block under real-time ultrasonographic guidance by placing 0.1 ml kg⁻¹ bilaterally in the space between the posterior aspect of the sheath and the rectus abdominis muscle.

CONCLUSION: The bilateral placement of levobupivacaine 0.25% 0.1 ml kg⁻¹ in the space between the posterior aspect of the rectus sheath and the rectus abdominis muscle under real-time ultrasonographic guidance provides sufficient analgesia for umbilical hernia repair. The unpredictable depth of the posterior rectus sheath in children is a good argument for the use of ultrasonography in this regional anaesthetic technique in children.

First clinical experience of tracheal intubation with the SensaScope(R), a novel steerable semirigid video stylet

Biro, P. Battig, U. Henderson, J. Seifert, B., Br. J. Anaesth. 97(2) 255-261.

BACKGROUND: Problems with tracheal intubation are a major cause of anaesthesia-related morbidity and mortality. Difficulty with tracheal intubation is primarily a consequence of failure to see the vocal cords with conventional direct laryngoscopy. We report our experience with use of the SensaScope(R) for tracheal intubation in routine clinical practice.

METHODS: The SensaScope(R) is a hybrid steerable semirigid S-shaped video stylet. Its handling and performance were assessed by anaesthetists with a minimum of 1 yr of experience. They performed four intubations each with the device in anaesthetized elective surgical patients. The view of the glottis with the Macintosh laryngoscope was compared with the view shown on the monitor by the SensaScope(R). The time taken to complete intubation, the final tracheal tube (TT) position and the degree of difficulty of the procedure were recorded.

RESULTS: Thirty-two patients were studied. All Macintosh Cormack and Lehane grade 3 patients were converted to grade 1 or 2 with the SensaScope (R). Mean intubation time was 25 (12)s and

correct mid-tracheal TT cuff position was achieved in all cases. The degree of difficulty was 3.0 (1.8) on a numerical scale ranging from 0 to 10. All operators rapidly became familiar with the device and mastered its technique of use.

CONCLUSION: The SensaScope(R) is a reliable and effective device for tracheal intubation under vision of the normal airway. It has great potential to facilitate management of difficult airway situations in anaesthetized and paralysed patients.

Incidence and Predictors of Difficult and Impossible Mask Ventilation.

Clinical Investigations

Anesthesiology. 105(5):885-891, November 2006.

Kheterpal, Sachin M.D., M.B.A. *; Han, Richard M.D., M.P.H. *; Tremper, Kevin K. Ph.D., M.D. +; Shanks, Amy M.S. ++; Tait, Alan R. Ph.D. [S]; O'Reilly, Michael M.D., M.S. [//]; Ludwig, Thomas A. M.D., M.S. *

Abstract:

BACKGROUND: Mask ventilation is an essential element of airway management that has rarely been studied as the primary outcome. The authors sought to determine the incidence and predictors of difficult and impossible mask ventilation.

METHODS: A four-point scale to grade difficulty in performing mask ventilation (MV) is used at the authors' institution. They used a prospective, observational study to identify cases of grade 3 MV (inadequate, unstable, or requiring two providers), grade 4 MV (impossible to ventilate), and difficult intubation. Univariate and multivariate analyses of a variety of patient history and physical examination characteristics were used to establish risk factors for grade 3 and 4 MV.

CONCLUSIONS: The authors observed the incidence of grade 3 MV to be 1.4%, similar to studies with the same definition of difficult MV. Presence of a beard is the only easily modifiable independent risk factor for difficult MV. The mandibular protrusion test may be an essential element of the airway examination.

The Incidence and Outcome of Perioperative Pulmonary Aspiration in a University Hospital: A 4-Year Retrospective Analysis

Tetsuro Sakai, Raymond M. Planinsic, Joseph J. Quinlan, Linda J. Handley, Tae-Yop Kim and Ibetsam A. Hilmi

We evaluated the current incidence and outcome of perioperative pulmonary aspiration (PPA) in the nonobstetric adult population at a tertiary university medical center. A 4-yr retrospective analysis (January 2001–December 2004) was conducted using both quality improvement data and the hospital-wide medical archive recording system. PPA was defined as either detection of nonrespiratory secretions from the tracheobronchial tree or development of new pulmonary symptoms and/or new abnormali-

ties in chest radiographs within 24 hr postoperatively. Of 99,441 anesthetics, 14 cases had confirmed PPA. Seven of them (50%) occurred in connection with gastroesophageal procedures. All patients had one or more predisposing risk factors for PPA. PPA occurred under general anesthesia in 10 patients and under monitored anesthesia care in 4 patients. In general anesthesia cases, the aspiration was recognized immediately after induction in 5 patients and occurred during changing of the endotracheal tubes in 5. The PPA was detected during the surgical procedures in all the monitored anesthesia care cases. Six patients with confirmed PPA developed pulmonary complications, of which, one died. Ten of 14 (70%) cases of PPA were the result of improper anesthesia technique. The current incidence of PPA is 1 of 7103, with morbidity 1 of 16,573 and mortality 1 of 99,441.

Task Analysis of the Preincision Period in a Pediatric Operating Suite: An Independent Observer-Based Study of 656 Cases.

Haleh Saadat, Alejandro Escobar, Elizabeth A. Davis, Jan Ehrenwerth, Gail Watrous, Gene S. Fisch, Zeev N. Kain, and Paul G. Barash

We designed this cross-sectional investigation to assess anesthesia release time (ART = patient-on-table until release for surgical preparation) and surgical preparation time (start of surgical preparation to incision) of children undergoing anesthesia and surgery ($n = 656$). Data collected by trained independent observers included variables such as age, ASA physical status, anesthetic technique, and placement of invasive monitoring. We found that mean ART was 11.0 ± 9.7 min and the mean surgical preparation time was 11.1 ± 10.0 min. Also, ART ranged from 7 ± 7 min (for mask anesthesia) to 52 ± 18 min (general anesthesia/endotracheal tube and invasive hemodynamic monitoring). The percentage of ART of the total case length was $15\% \pm 7\%$, with a wide variability depending on the total case length. We also found that there is a significant variability in ART as a function of the surgical service involved (analysis of variance; $P = 0.0001$), ASA physical status ($P = 0.0001$), and age. For example, younger children had a significantly longer ART as compared with older children ($P = 0.001$). Room coverage ratio by the attending anesthesiologist and training level of the anesthesia resident did not impact ART ($P =$ not significant). We conclude that ART in children undergoing surgery is highly variable and is a function of factors such as the surgical service involved, age of the child, and ASA physical status of the child. These factors should be considered when scheduling a surgical case.

Task Analysis of the Preincision Surgical Period: An Independent Observer-Based Study of 1558 Cases

Alejandro Escobar, Elizabeth A. Davis, Jan Ehrenwerth, Gail A. Watrous, Gene S. Fisch, Zeev N. Kain, and Paul G. Barash

Intense production pressure has focused on the preincision period (from patient-on-table to incision) as an important com-

ponent of overall operating room efficiency. We conducted a prospective study in which trained independent observers measured the performance of anesthesiologists, surgeons, and nursing staff to determine anesthesia release time (ART, patient-on-table until release for surgical preparation) and surgical preparation time (SPT, start surgical preparation to incision) and the factors, including delays, that affect their duration. We enrolled 1558 patients undergoing elective surgery in a tertiary medical center. The mean ART was 21 ± 16 min. Mean SPT was 22 ± 13 min, and mean case length was 207 ± 123 min. Significant variation was seen in both ART (range, 1–115 min) and SPT (range, 1–130 min). Multivariate regression analysis revealed ASA physical status, age, level of resident training, invasive monitoring, case length, and case number in the room were all positive predictors of ART duration ($P < 0.05$). In contrast, gender, body mass index, number of anesthesia personnel concurrently in the room, and number of rooms covered per anesthesia attending were not predictors for ART ($P > 0.05$). Delays affected both ART and SPT and were encountered in 24.5% of all procedures (surgery 66.8%, anesthesiology 21.7%, and logistical 11.5%). For operating room scheduling purposes, we conclude that assigning a constant fixed duration for anesthetic induction is inappropriate and will result in creating erroneous administrative expectations.

The Effects of Spinal Anesthesia on QT Interval in Preeclamptic Patients

Selda Sen, Galip Ozmert, Hakan Turan, Eray Caliskan, Alper Onbasili, and Duran Kaya

In this study, we measured the effects of spinal anesthesia on the corrected QT (QTc) interval in women with severe preeclampsia. Twenty-five preeclamptic (preeclamptic group) and 25 healthy pregnant women with normal arterial blood pressure and QTc interval (control group) were enrolled in this prospective, case-controlled study. Arterial blood pressure, heart rate, and QTc interval values were obtained before (baseline value) and at 5, 10, 20, 30, 60, and 120 min after initiation of spinal anesthesia. Total ephedrine dose, time elapsed until sensory block, and Apgar scores were recorded. Prior to spinal anesthesia, QTc interval values were significantly higher in the preeclamptic group (452 ± 17.5 ms) when compared with that in controls (376 ± 21.4 ms). Although the QTc interval shortened during spinal anesthesia when compared with baseline value in the preeclamptic group ($P < 0.05$), it showed no significant change in the control group. In conclusion, the QTc interval may be prolonged in severe preeclamptic patients who have hypertension and hypocalcemia. Spinal anesthesia for cesarean delivery may normalize that prolonged QTc interval due to sympathetic blockade.

