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ABSTRACTS OF POSTER PRESENTATIONS

**Annual Congress of the European Society
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Palma de Mallorca, September 22nd – 24th 2011

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0130 Dexketoprofen vs racemic ketoprofen for treatment severe postoperative pain in elder children.

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0004 ANALGESIC EFFICACY OF ULTRASOUND-GUIDED TRANSVERSUS ABDOMINIS PLANE BLOCK AFTER OPEN APPENDECTOMY IN CHILDREN

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Background: To date there are only few reports on the use of TAP block in children. We present a randomized, prospective, observer-blinded study on the analgesic efficacy of TAP block in children who underwent open appendectomy.

Materials and methods: Thirty-four children aged 3 to 17 years (ASA 1-2) were enrolled in this study. Patients were randomized in two groups (17 in each) differing in the postoperative analgesia plan. Patients in group T were assigned to receive TAP block at the end of surgery, and those in group O were to receive conventional opioid-based pain treatment. Pain scores were registered four times during the initial 24 hours.

Results: The overall opioid consumption was 1345 mg tramadol in group O, against 210 mg in group T. Pain scores were significantly lower in the TAP group for the initial 24 hours ($p < 0.05$). No complications related to transversus abdominis plane block were encountered. Nausea and vomiting were relatively common in group O – 45% against 17% in group T.

Conclusion: Transversus abdominis plane block is an effective and safe regional technique and provides superior pain relief to the opioid-based pain treatment in children with appendectomy.

Key words: transversus abdominis plane block, ultrasound, children, appendectomy

0005 ULTRASOUND-GUIDED INFRACLAVICULAR BLOCK FOR TRAUMA SURGERY IN CHILDREN

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Background: Ultrasound guided peripheral nerve blocks are still rarely used techniques for intra- and postoperative analgesia in pediatric patients. The purpose of this study was to compare the quality of analgesia in children who received either ultrasound-guided infraclavicular block or parenteral opioid analgesia.

Methods: We randomized 34 children aged 17 months to 16 years into two groups: group 1 who received ultrasound-guided infraclavicular block combined with intravenous or inhalational sedation, and group 2 who received general anesthesia with additional intravenous fentanyl. Children in both groups were monitored for 24 hours after anesthesia. We recorded the duration of the block, the intensity of pain, the postoperative need of opioid supplementation and complications or side effects related to either techniques.

Results: In 16 children from group 1 (94.2%) a successful block was obtained. In 1 patient the blockade of brachial plexus failed and supplementary fentanyl was added. Mean intensity of pain assessed according to visual-analogue scale (VAS) in group 1 was 4.9 and NSAIDs were enough to deal with it. In group 2 76.3% of the patients experienced pain above 7 (according to VAS) between third and fifth postoperative hour and needed additional opiate by mouth. Mean duration of pain free period in group 1 was 378.7 minutes.

Conclusion: Infraclavicular block of brachial plexus provides better comfort after surgery in pediatric patients, than conventional analgesia with opiates. Ultrasound guidance permits the performance of this technique to be safer and with greater success rate.

Key words: ultrasound, infraclavicular block, children.

0007 Postoperative pain syndrome in children after abdominal surgery correlates with raised level of cortisol, interleukin 6 (IL6), IL8 (IL8) and C-reactive protein (CRP).

Dmytro Dmytriiev¹, Kateryna Dmytriieva¹, Oleksander Nazarchuk¹, ¹*Vinnitsa national medical university, Vinnitsa, Ukraine*

Background: One of the most difficult challenges still facing researchers and clinicians is assessing pain in the newborn. The mechanisms contributing to postoperative pain syndrome (PPS) in children 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 PPS after abdominal surgical procedure.

Methods: Prospective observational study involving children with PPS after abdominal surgery and normal controls. All patients after operation received adequate analgesic therapy (continuous infusion opioid analgesics). Blood samples were taken at birth from mixed cord blood, at 8 h, 24 and 42 h for cytokines, cortisol and CRP after surgical procedure. Data were analysed using analysis of variance and 2 analyses.

Results: 44 children with PPS and 20 controls were enrolled. 22/44 (50 %) patients with PPS required mechanical ventilation, 4/44 (9,1%) required high-frequency ventilation and 1/44 (2,2%) died. Patients with PPS 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 2.87- fold higher in neonates than the controls group ($p < 0.003$). All patients with PPS had significantly ($p < 0.001$) higher plasma cortisol levels over control group (mean \pm SD, 444.8 \pm 38.1 vs. 198.2 \pm 33.9 micromol/l on 8 h; 800.2 \pm 104.2 vs. 355.2 \pm 98.4 micromol/l on 24 h; 644.2 \pm 40.3 vs. 306.0 \pm 40.2 micromol/l in 42 h).

Conclusion: This study demonstrated that postoperative pain syndrome is associated with raised blood levels of proinflammatory mediators and cortisol, suggesting that inflammation contributes to the postoperative pain syndrome in children.

0008 Administration of bupivacaine 0, 25% with low dose ketamine reduces local cytokine expression in postoperative wound.

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Background: Inflammation and nociceptive sensitization are hallmarks of tissue surrounding surgical incisions. Recent studies demonstrate that several cytokines may participate in the enhancement of nociception near these wounds. Our studies were directed towards determining if administration ropivacaine with low dose ketamine alter cytokine production near postoperative wound after experimental model gastroshisis in rats.

Methods: A rats operative incisional model gastroshisis was used to measure the effects of bupivacaine 0, 25% with low dose ketamine (0,1 mg/kg) administration on nociceptive thresholds and cytokine production in abdominal wall skin 45 minutes, 4 hours after incision. We examination 22 rats, undergoing operative incisional model gastroshisis, first group receive combination bupivacaine 0, 25% with low dose ketamine, second group without analgesic administration. For statistical anals 2 tests were used.

Results: Operative incised abdominal wall displayed profound allodynia which was reduced by bupivacaine 0, 25% with low dose ketamine combination in the 4 hours following incision. Skin abdominal wall samples harvested from these rat showed enhanced levels of 4 cytokines: IL-1 β , IL-6, tumor necrosis factor alpha (TNF α), and granulocyte colony stimulating factor (G-CSF). Ropivacaine with low dose ketamine administration reduced these incision-stimulated levels. First group lower cytokines levels over second group (mean +/- SD, IL-1 β - 7.4 +/- 0.6 vs. 22.2 +/- 2.0 pg/mg protein; IL-6- 207.2 +/- 88.2 vs. 442.2 +/- 92.2 pg/mg protein; TNF α - 20.1 +/- 2.2 vs. 44.4 +/- 4.4 pg/mg protein and G-CSF - 1.2 +/- 0.2 vs. 4.4 +/- 1.0 pg/mg protein) ($p < 0.001$).

Conclusion: Bupivacaine 0, 25% with low dose ketamine administration reduces peri-incisional cytokine expression. These studies suggest that bupivacaine 0, 25% with low dose ketamine combination may alter the inflammatory reaction.

0009 Positive end-expiratory pressure affects the value of intra-abdominal pressure in acute respiratory distress syndrome in newborn after abdominal surgery.

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Introduction: To examine the effects of positive end-expiratory pressure (PEEP) on intraabdominal pressure (IAP) acute respiratory distress syndrome (ARDS) in newborn with after abdominal surgery.

Methods: 44 sedated and mechanically ventilated patients with ARDS admitted to a twenty-bed surgical medical ICU were included. All patients were studied with sequentially increasing PEEP (0, 6 and 12 cm H₂O) during a PEEP trial.

Results: Age was $4,2 \pm 2,1$ days, weight was $2004,4 \pm 344,2$ g, SAPS II was 42 ± 15 and PaO₂/FIO₂ was $190,1 \pm 53,2$ mmHg. The IAP was $4,44 \pm 1,2$ mmHg at PEEP 0 (zero end-expiratory pressure, PEEP), $11,2 \pm 0,96$ mmHg at PEEP 6 and $15,2 \pm 1,1$ mmHg at PEEP 12 ($P < 0.05$ vs PEEP). In the patients with intra-abdominal hypertension defined as IAP ≥ 12 mmHg (n= 20), IAP significantly increased from $16,1 \pm 3,3$ mmHg at PEEP to $21,2 \pm 3,1$ mmHg at PEEP 12 ($P < 0.01$). Whereas in the patients with IAP < 12 mmHg (n= 10), IAP did not significantly change from ZEEP to PEEP 12 ($8,3 \pm 2,1$ vs $9,8 \pm 2,8$ mmHg). In the 14 patients in whom cardiac output was measured, increase in PEEP from 0 to 12 cmH₂O did not significantly change cardiac output, nor in the 9 out of 16 patients of the high-IAP group. The observed effects were similar in both ALI (n =21) and ARDS (n =14) patients.

Conclusions: PEEP is a contributing factor that impacts IAP values. It seems necessary to take into account the level of PEEP whilst interpreting IAP values in patients under mechanical ventilation.

0011 Tonsillar Hypertrophy and Negative-Pressure Pulmonary Oedema

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Introduction

Negative Pressure Pulmonary Oedema is a rare condition that occurs when a large negative intrathoracic pressure is generated against an obstructed upper airway causing fluid to shift into the lung interstitium.[1] It happens in the majority of cases in young and well-being patients.[2]

Case Report

The authors report a case of a 15 years-old male patient with a history of sinusitis and recurrent tonsillitis, proposed for a tenorrhaphy of the Achilles tendon. An general anaesthesia under standard ASA monitoring was started with Midazolam (1mg), fentanyl (100µg), propofol (150 mg) and rocuronium (30mg). After intubation under visualization of the vocal cords, the patient was positioned in the prone position. The anaesthesia was maintained with sevoflurane (MAC 2%). The procedure lasted one and a half hour uneventful. After extubation under spontaneous ventilation we observed paradoxical abdominal movements and no expansion of the chest.

Because we experience difficulty on mask ventilation and the patient became hypoxemic (78%), propofol was administered and allowed improvement in oxygen saturation (Sa O₂) to 98%. The cardiopulmonary auscultation identified the presence of bilateral wheezing and it was administered hydrocortisone (200mg).

After adequate spontaneous ventilation, patient was forwarded to the recovery room where he started again with difficulty breathing and hypoxemia (Sa O₂ 80%). The patient presented bilateral crackles that were interpreted as acute pulmonary oedema. We started treatment with oxygen, elevation of the headboard, intravenous furosemide (20mg) and morphine (2mg), sublingual nitroglycerin (0,5 µg) and water restriction. Chest radiography revealed a diffuse image opacity consistent with pulmonary oedema. Blood gas showed an acute respiratory acidosis. The others exams were normal. There was an improvement of the symptoms 15 minutes after the onset of treatment without any other measurements. He was discharged asymptomatic from the recovery room 8 hours later with an improvement of the opacity in the radiography. The x-ray made 36 hours later was normal. He went home on the 8th day after ended intravenous antibiotic prophylaxis.

Discussion

Negative Pressure Pulmonary Oedema is a clinical condition that increases morbidity and mortality in healthy patients undergoing low risk procedures.[2] Specific risk factors include patients with a predisposition to upper airway obstruction like history of obstructive sleep apnea or tonsillar hypertrophy. The diagnosis is based on clinical and

chest radiography and a exclusion of other causes of pulmonary oedema should be made. Treatment should support the respiratory function with positive ventilation and if it starts promptly allows a quick resolution. Nevertheless there are cases of deaths reposted. Corticosteroids and furosemide are controversial. [3]

References

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0012 Audit of regional nerve block techniques used in children in a tertiary hospital (UK)

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Introduction: The practice of regional anaesthesia has been revolutionized with the advent of ultrasound-guided nerve blocks. NICE has also recently advocated the practice of Ultrasound guided regional anaesthesia (UGRA) with its perceived advantages of improved block quality and duration and use of smaller doses of local anaesthetic (Ref). We conducted this audit to establish whether the techniques for performing regional nerve blocks in our hospital matched the current standards.

Methods: A questionnaire was sent to all anaesthetists in our department and information collected on training undergone in UGRA and techniques used to perform regional nerve blocks.

Results: We received 33 completed forms (response rate 87%); 57.5% Consultants and 42.5% trainees. Although 84% of consultants had >5 years experience in performing regional nerve blocks, only 47% did so on a regular basis. The vast majority of trainees lacked experience (<1year) and performed blocks only occasionally in children. 72% of responders were aware of NICE guidelines and 79% had undergone some form of training in UGRA. The reasons for not using ultrasound were either 'lack of training' (42%) or 'not routine practice' (33%), the former being more common amongst trainees. The techniques used for 18 commonly performed regional nerve blocks were also studied. 10 blocks were preferably performed under ultrasound guidance and 8 blocks by the landmark technique, by the majority of anaesthetists. The peripheral nerve stimulator was used for only 5 of the nerve blocks studied. Lower limb blocks were performed more frequently than upper limb blocks. Amongst the commonest nerve blocks, 92% of TAP blocks, 30% of Ilio-inguinal/ Ilio-hypogastric and 0% of penile blocks were performed under ultrasound guidance

Conclusion: Keeping in with recent advances, the vast majority of anaesthetists in our hospital are trained in UGRA. However, the use of traditional landmark and nerve stimulator techniques continue to be popular in practice. The cautious approach adopted by paediatric anaesthetists in this transition could be due to lack of strong evidence of the benefits of UGRA in children as opposed to adults and operator familiarity with the more traditional but well established techniques of regional anaesthesia. The lack of training opportunities amongst trainees may reflect the current trends of reduction in training time and caseload and need to be addressed.

Reference:

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0013 A survey on techniques of insertion and damage caused by oropharyngeal airways. Obeying the European Paediatric Life support guidelines?

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Introduction

Both EPLS and APLS manuals state that, in order to minimise the risk of causing damage to the palate in small children, oropharyngeal airways (OPAs) should be directly inserted, convex side up and without rotation, using a tongue depressor or laryngoscope blade. We have observed that this does not appear to be standard practice amongst paediatric anaesthetists, so we designed a survey to research current practice on OPA insertion and to discover whether technique of insertion had any influence on damage to the airway.

Method

We constructed a survey of 8 questions using Survey Monkey, which was sent to all 1060 members of the Association of Paediatric Anaesthetists . The survey asked respondents how they size and insert oropharyngeal and nasopharyngeal airways. It also enquired if insertion of the airway was associated with trauma and, if so, whether this was related to a particular insertion technique. We received 279 responses (26% of members).

Results

The majority of anaesthetists answering the survey were of consultant grade with 57% having greater than 10 years paediatric anaesthetic experience. 55% use a direct method of inserting the oropharyngeal airway but without using a tongue depressor or laryngoscope. 34% use the same technique they used in their adult practice (i.e. insertion upside down followed by 180 degree rotation). Only 6.8% fully adhere to EPLS or APLS guidelines for insertion, although the majority did use their recommended methods for sizing airways. 90% of the survey responders have never seen damage to the soft or hard palate. Of the 10% who did report damage, it was minor and associated with rough or forceful placement of the airway, rather than with a particular technique of insertion.

Discussion

The guidelines set out by EPLS and APLS to size and insert OPAs in children are present to avoid trauma and airway complications. The most regular users of airways in children are paediatric anaesthetists, but only a minority of those who answered our survey actually follow these guidelines. Despite this, there were no reports of serious trauma

Conclusions

We conclude that it is not necessary to use the technique suggested by APLS and EPLS guidelines for safe insertion of oropharyngeal airways. Damage to the airway from these devices is uncommon and minor if it does occur. Trauma appears to be related to the use of force, rather than to any particular insertion method, so the emphasis should be on careful insertion rather than the use of a specific technique.

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0015 A service evaluation of topical lignocaine cream (LMX 4) for venous cannulation in children

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Introduction

LMX 4 is a new liposomal lignocaine cream licensed for topical anaesthesia to facilitate venous cannulation and is cheaper than EMLA (eutectic mixture of local anaesthetic) and Ametop. EMLA and Ametop have been found to have similar efficacy with 80% of children obtaining satisfactory topical cutaneous anaesthesia (no or mild pain) when Ametop was studied¹. LMX 4 was recently introduced into our day surgery unit and there was concern that the analgesia provided was inferior to EMLA or Ametop. No publications exist regarding LMX 4's effectiveness in routine practice. The aims of our service evaluation were to determine the incidence of pain on venous cannulation following application of LMX 4 cream, the associated complication rate and incidence of skin changes.

Methods

All children attending our day surgery unit and requiring venous cannulation were eligible. An evaluation sheet was created and provided to all theatre anaesthetists to complete for eligible patients. The pain response was assessed by the theatre anaesthetists according to a validated four point pain scale¹. The service evaluation was discussed with our local ethics committee with the requirement for formal ethics committee application waived.

Results and Discussion

199 children were included in the evaluation over a two month period. The mean age was 6.3 years (range 4 months to 20 years) and 64% were male. 83% were Caucasian, 4% Asian and 10% African. 38% of cannulae were inserted by consultants, 42% by specialty trainees (ST) years 5-7 and 18% STs 1-4. 97% of cannulae were inserted into the dorsum of a hand and 0.5% the dorsum of a foot. The mean duration of cream application was 137 minutes (range 15-310 minutes). In 81% of patients one attempt at cannulation was made, 13% two attempts and 4% three attempts. The pain score on cannula penetrating the skin was: none 67%, mild 17%, moderate 13% and severe 3%, which is similar to published work on other topical local anaesthetics¹. The complication rates were: cannula required to be inserted at a different site 1.5% and gas induction 10%, which may reflect our local practice with difficult cannulation. Skin changes at the site of cream application were: none 39%, pallor 54%, erythema 5%, vasoconstriction 5% and vasodilatation 1.5%. The rate of skin pallor with LMX 4 in our service evaluation was higher than in the published literature.

Conclusion

The incidence of pain on venous cannulation following the application of LMX 4 cream in children appears to be similar to Ametop and EMLA. We discovered a higher incidence of

skin pallor than in previously published work on LMX 4; the significance of which is unclear.

References

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0016 Use of ultrasound prescanning in predicting the difficulty of the caudal epidural block in neonates and infants

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Background

Caudal block provides potential benefits for patients undergoing lower abdominal surgery in neonates, but technical difficulty represents a problem in 11% of these patients (1). Ultrasound visualization of the caudal space may identify potential anomalies or anatomical variants. We hypothesize that clear ultrasound visualization of neonatal neuraxial structures is a potential advantage and predicts a difficult block.

Methods

35 neonates and infants [18 days-6 months old, 2.1-8.4 kg] scheduled for lower abdominal surgery underwent a preoperative ultrasound scan of the neuraxial structures and caudal space using a high frequency linear transducer (longitudinal and transverse scanning). All anomalies were videorecorded together with the whole procedure that was subsequently further studied. The total number of needle passes (defined as any needle redirection) and time required to perform the caudal block were also recorded. Additionally, local anesthetic spread was also verified by the use of ultrasound colour doppler flow.

Results

There was no difference in the time needed for the caudal block procedure, but the number of passes was greater only in two neonates where anatomical variants (poor visualization of the sacral cornua during ultrasound transverse scanning) were observed. Poor ultrasound visualization of the sacral cornua predicted a difficult block and an alternative regional technique was performed.

Discussion

Inability to visualize the sacral cornua was associated with prolonged and difficult caudal block procedure. The relatively low incidence of difficult caudal block in patients undergoing lower abdominal surgery leads to operating room delays and patient discomfort. Ultrasound scanning may be useful to predict this difficulty allowing the anesthesiologist to avoid the caudal block and choose an alternative regional block or to identify an optimal vertebral interspace.

References

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0017 Efficacy and safety of Echoguided Transversus Abdominis Plane Block for postoperative pain relief in pediatric patients.

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Background

The transversus abdominis plane block (TAP) is a recently described peripheral nerve block for the sensory nerves in the triangle of Petit before they exit the transversus abdominis neuro-fascial plane. In adults, it has been shown to reliably decrease postoperative pain scores and opioid requirement in patients undergoing large bowel resection via midline abdominal incision and in women after cesarean delivery. In our study we demonstrated that ultrasound-guided TAP block (1) was safe and efficacious in the pediatric population for unilateral inguinal hernia and hydrocele repair together with a reduction in postoperative pain and analgesics requirements.

Methods

46 children (26 males, 20 females) ASA 1 - 2, 1-10 years old, 9-53 kg, scheduled for unilateralinguinal hernia and hydrocele repair were enrolled in this study after informed consent of parents. Under general anesthesia, induced with propofol or sevoflurane and maintained with laryngeal mask airway in a mixture of air/O₂/sevoflurane, all the patients received US-guided TAP Block before surgery. TAP block was performed under real-time ultrasonographic guidance with 0.30 cc/kg of 0.25% levobupivacaine. Muscle relaxants and opioids were not administered.

Results

All blocks were successful and only two patients required analgesics as rescue in postoperative period. The mean duration of postoperative parietal analgesia (time for first analgesic rescue), evaluated by CHIPPS scale, was 15±2 h. Children had excellent postoperative comfort. No complications associated were recorded.

Conclusions

Ultrasonography-guided TAP block in pediatric patients are easy to perform, provides consistent post-operative/intraoperative pain relief and may represent an alternative to epidural/caudal anesthesia.

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0018 Nasotracheal intubation in pediatric patients: our experience about a new technique

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Introduction

It is well known that the major difficulty in performing nasotracheal intubation is represented by the necessity to obtain a perfect alignment between the tip of the tube and the plane of glottis and vocal cords. The presence of tonsillar and adenoidal hypertrophy in pediatric patients can make the procedure more difficult and cause bleeding. In our experience we found the use of Endoflex tube very useful and safe for nasotracheal intubation.

Material and Methods

The EndoFlex tube (Merlyn Associates, Tustin, CA) has a distal-tip flexing mechanism which is articulated by a durable monofilament cable and is controlled by an exclusive friction lock. Thanks to these characteristics it's possible to perform tracheal intubation in pediatric patients via nasal route because its distal tip can be adjusted to follow the anatomical curve of the nasopharynx by polling the friction lock upward and downward (1). We treated 7 pediatric patients aged 3-6 years undergoing facial or oral surgery and taking of oral mucosa for genitorurinary reconstruction surgery. Under direct laryngoscopy the tip of the Endoflex was flexed changing the angle of insertion to better meet the plane of glottis while advancing the tube that was easily inserted into the trachea. Anesthetic management was conducted as usual: induction with sevoflurane in Air/O₂ or i.v. propofol, curarization with cisatracurium and i.v. administration of fentanyl.

Results and Discussion

In many pediatric patients the oral cavity is so small and this makes much more difficult every maneuvers especially if clamps, forceps or other devices need to be introduced. An other advantage of this technique is that it can be performed by a single operator. The duration of the procedures requires few minutes (5 min as median in expert hands) and is safe and efficacy without complications. We find this procedure feasible and safe to reduce trauma during pediatric airway management.

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0019 Comparative analysis of the treatment in newborns with oesophageal atresia in postoperative

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Introduction.

Since 2008 all patients suffering from esophageal atresia with fistula, runs thoracoscopic treatment. The target of our study was to carry out a comparative analysis of newborns treatment in primary esophageal plastic using ordinary thoracotomy (the first group) and thoracoscopic technology (the second group) in the postoperative period.

Materials and methods:

the first group included 35 neonates, average weight at birth was 2750 ± 450 grams (from 1670 to 3400 grams.), the median gestational age 38.3 ± 1.2 weeks (from 36 to 40). The second group included 36 newborns, average weight at birth stood at 2648 ± 710 grams (from 960 to 3400 grams.), the median gestational age 37.8 ± 1.8 weeks (from 34 to 40).

Results.

Duration of mechanical ventilation in postoperative period in the first group of 5.04 ± 3.2 days, in the second group duration of mechanical ventilation was 3.23 ± 3.8 days. The average length of stay in ICU after surgery, 1st group was 10.3 ± 6.5 days (4-38 days), 2nd team - 7.5 ± 2.7 days (from 7 to 19 days). Feeding by nasogastric tube in the second group was started after a mean of 3 days and 4 days in the first group.

Discussion.

The compression of lung on the side of traditional surgery, carbon insufflations in pleural cavity with endoscopic complications, postoperative defect correction effect the postoperative period. Improved PaCO₂ in the early postoperative in the second group was noted. Earlier beginning of feeding in the second group was the result of to the lack of postoperative intestinal indigestion. Hemodynamics, respiratory indicators are more stable in the second group of patients that is associated with a non-traumatic operation. Dopamine therapy was carried out in 35% of patients with the first group. Analgesia and sedative therapy were similar in both groups. Complications in the postoperative period were found in 27 (39.4%) children (12 in the first group, 15 in the second group): recovered at fistula, leakage and stenosis of the anastomosis.

Post-surgical lethality in groups 1 and 2

Cause of death	1 group (children)	2 group (children)
Leakage of the anastomosis (pneumonia)	3 (4,2%)*	0 (0%)
Multiple malformations	2 (2,8%)	2 (2,8%)
Edwards syndrome	1 (1,4%)	1 (1,4%)
Total	6 (8,4%)	3 (4,2%)

Conclusions. Postoperative period in the second group of patients is easier than in the first group because due to less traumatic operation, stable hemodynamics, an earlier start of the feeding and fewer postoperative complications.

0021 Prone positioning during spinal surgery in children: the effect on hepatic transaminases

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Introduction

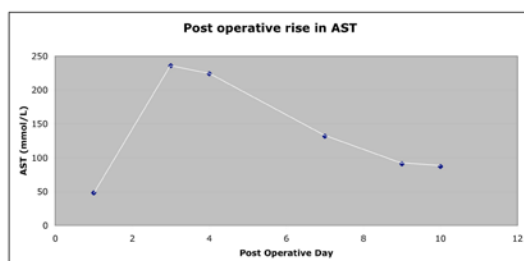
There have been several papers documenting the effect of prone positioning on adults^{1,2}, but little is written about paediatric practice. We describe changes observed in hepatic transaminases in a paediatric population requiring prone positioning for spinal surgery under general anaesthesia.

Methods

Retrospective analysis was undertaken on data collected from 56 paediatric patients having posterior spinal correction surgery. Liver function was tested both pre- and post-operatively on all patients. Patients were anaesthetised by a small group of consultant anaesthetists experienced in this procedure, using TIVA or volatile-based anaesthesia, standard invasive monitoring and cell salvage. The children were positioned prone on either the Allen[®] table or the Knight[®] table, or on the standard operating table using lateral or transverse bolsters.

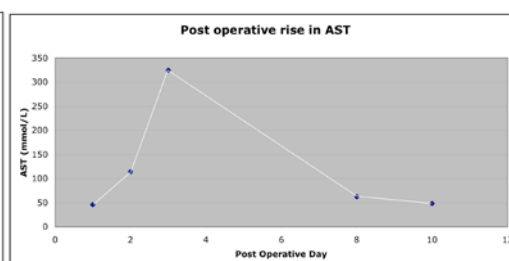
Results

Prone positioning was required for prolonged periods (mean 6.43 hours, range 2-11.5 hours). Hepatic transaminases increased from pre-operative values in 94.6% (53/56) of patients post operatively. Mean increase in Aspartate Transaminase (AST) was 325% (range 90-2290%) and in Alanine Transaminase (ALT) was 303% (range 50-2475%). Changes in Bilirubin and Alkaline Phosphatase levels were much less significant. In a small number of patients, gross derangements of AST and ALT were seen. Serial results on two children demonstrate a peak at day 3 postoperatively returning to near pre-operative values over the following days.



1

Patient 2



Patient

Discussion

The extent of the almost inevitable rise in transaminases appeared to be linked to greater blood loss and longer durations of surgery. The method used for prone positioning may also be a factor. Although only used on 14.2% (8/56) of patients, transverse bolsters accounted for 71% (5/7) of patients with the most grossly deranged transaminases. The

pattern of changes in liver enzymes indicates hepatocellular dysfunction, possibly related to direct liver compression or obstruction of venous return during prone positioning. Whilst changes in liver function tests may be profound in some patients, they appear to resolve spontaneously within the subsequent two weeks with no significant impact on clinical liver function. We suggest that transverse bolsters should be used with caution in children and that liver function should be reviewed post-operatively in all patients who have been prone.

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0022 Rees Bear has an anaesthetic - providing age-appropriate patient information for young children

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Introduction

'Rees Bear has an anaesthetic'[1] is a leaflet designed for children aged 2 - 7 years. It presents information about general anaesthesia in a story format, told from the perspective of an anthropomorphic bear who has had a recent anaesthetic and wishes to share his experience with the reader. The simple illustrated text was developed with the assistance of a multidisciplinary team and children of the target age. We wished to determine whether the information could indeed be read independently and understood by a group of young schoolchildren.

Method

'Rees Bear has an anaesthetic' was used as the source text for a specifically designed comprehension test. The style of national educational standard assessment tests was used, including similar question types and a standard marking scheme. Questions checked children's understanding of the text, and also asked them to state their favourite part of the story. Approval was granted by the hospital service evaluation department for the test to be administered, with parental consent, to 76 children aged 6-7 years at a local school. The children had had experience of completing similar tests as part of their recent learning. The completed test papers were marked by three class teachers and reviewed by the author.

Results

The children engaged well with the test and no child was distressed by the subject matter. 83% of children scored more than 50% on the Rees test and 60% scored more than 75%. This compares very favourably with the children's results on an age-appropriate similar national test, in which 60% of children achieved more than 50% correct answers and 17% more than 75% correct answers. Although most children gave appropriate answers which directly quoted the text, many gave other imaginative explanations derived from their own understanding. When children were asked what they liked best about Rees's story, many said they liked when Rees could play, several liked the part when he was allowed to eat again, and a few specifically said they liked the pictures. There were a number of answers which implied that children had fully engaged with the subject of the text, however, such as 'knowing what an anaesthetist is', 'about the tiny tube to put in your hand' and 'the fact that Rees didn't die'.

Discussion

The scores from the comprehension test indicate that children aged 6-7 years do indeed have the ability to read, comprehend and write about the anaesthetic experience based on 'Rees Bear has an anaesthetic', thus confirming that the text is suitably pitched for its target age group. The children's answers also suggest that they are able to think beyond

the text to the wider meaning of the story and comprehend some of the issues involved in having an anaesthetic.

References

Rees Bear has an anaesthetic - <http://www.rcoa.ac.uk/docs/rees-colWebSpreads.pdf>

0023 Davy the Detective - finding out about anaesthetics: An effective information resource for children

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Introduction

Davy the Detective[1] is a new information leaflet about anaesthesia, designed for children aged 8-12 years. The story, told in the style of a comic strip, details a young boy's detective work as he finds out all he can about his forthcoming anaesthetic, and is supplemented by the factual information he records in the pages of his notebook. We wished to investigate which of the themes explored by 'Davy the Detective' are registered and understood by children aged 9-10 years, and how children who have read it describe the experience of anaesthesia.

Method

After approval by our hospital service evaluation department, and with parental permission, children aged 9-10 years at a local school were asked to read the booklet: 'Davy the Detective'. They were then given a blank sheet of paper with two prompts and were asked to write down their thoughts. The prompts were: 'I think Davy would like to ask the anaesthetist these questions...' and 'My story about Davy's anaesthetic'. The exercise lasted 1 hour and the results were analysed qualitatively.

Results

73 children took part in the exercise. 42 created an extension of the story in the leaflet, following Davy through his anaesthetic, surgery and recovery. 17 children retold the story of Davy's detective work, 10 of whom commented that all went well when Davy actually had his anaesthetic. A further 14 children wrote rather vague stories, perhaps indicating that they had found the exercise rather challenging. A small number, while giving little detail of the procedures involved in an anaesthetic, explored Davy's feelings about his hospital treatment. Many stories were extremely imaginative, but it was clear that all the children had retained some useful information about anaesthesia. Commonly recounted themes included: Davy's feelings about his anaesthetic, an explanation of anaesthesia and choices for induction, fasting, coping strategies for anxiety, and postoperative side-effects. The children thought that Davy would wish to ask further questions about: the timing of his operation, whether anything would hurt, side-effects and symptoms, more detail about the anaesthetic process and risk, and the capabilities of the anaesthetist.

Discussion

The children found 'Davy the Detective' engaging and readable. Their stories showed that they had read and understood both the comic strip story and the detailed factual notebook pages, and were able to relay what they had learned. Their work also indicated that they had been reassured, by Davy's discoveries about anaesthesia, that there is usually a positive outcome and that the level of risk is small. In spite of the comprehensive

information provided in the booklet, children still ask for more detail, and their questions are sophisticated, searching and tricky. On the basis of this study, it appears that the leaflet is appropriately written and presented for children of its target age, and can be recommended as a resource for preoperative information.

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0024 Efficacy of levobupivacaine, fentanyl and clonidine for postoperative analgesia in caudal epidural anesthesia

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Background

Fentanyl and clonidine (1) can be associated with local anesthetics in caudal epidural anesthesia in children in order to prolong analgesia in the postoperative period. In order to determine which way has a longer postoperative analgesia and less adverse effects we performed a retrospective study about the association of fentanyl with levobupivacaine and the combination of clonidine with levobupivacaine on children that underwent caudal epidural anesthesia.

Method

The retrospective study included 64 children aged between 1-5 years old, ASA I-II underwent low abdominal surgery. They were divided into three groups: (L) levobupivacaine 0.25%, (C) clonidine 1 mcg/kg and levobupivacaine 0.25%, (F) fentanyl 1 mcg/kg and levobupivacaine 0.25%. The evaluation of postoperative analgesia was accomplished through the CHIPPS pain scale and the motor blockade assessed by modified Bromage scale.

Results

Fentanyl and clonidine associated with levobupivacaine prolonged the duration of postoperative analgesia ($p < 0.05$) in caudal epidural anesthesia compared to levobupivacaine alone. Clonidine significantly delayed the time to first rescue analgesic versus fentanyl group and fewer patients required rescue analgesia in the 24 h after surgery. CHIPPS score was lower in group (C) than groups (F) and (L). Regarding hemodynamic parameters, levobupivacaine associated with clonidine (C) and levobupivacaine associated with fentanyl (F) groups didn't present blood pressure changes in the postoperative period. There was no significant difference between groups related to the blockade and no motor block or side effects were observed in all groups.

Conclusions

Fentanyl and clonidine associated with levobupivacaine improve postoperative analgesia without significant side effects but clonidine seems to be more effective.

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0025 Our anaesthesia experiences including 4 cases with Congenital Hyperinsulinism

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Congenital Hyperinsulinism (Nesidioblastosis) is the common reason of the severe, persistent hypoglycemia of newborn babies. It is characterized by hyperplasia and hyperinsulinemic hypoglycemia at pancreatic cells. The goal is to decrease the insulin amount by total or subtotal pancreatectomy(1) . We have intended to share our 6 anesthesia experiences of 4 cases, which were conducted in 3 years period at our own clinic.

Case 1: The male patient, who is a 50 day-old, 3800gr. Male baby had an already existing cardiac problem. The patient has been getting mechanical ventilation for 14 days and also been receiving 20 mg/kg/min. Glucose infusion, diazoxide, somatostatin and prednisolone treatment. 80% of his pancreas was removed in the first operation. The patient, whose postoperative hypoglycemia has been continued for 5 days, was taken into the operation again and kept only 5% of his pancreas.

Case 2: The male patient, who is a 45 day-old, 5200gr. Male baby had no existing pathology . He has been under prednisolone treatment and also been getting 16 mg/kg/min. glucose infusion. 90% pancreatectomy was applied.

Case 3: Macrozomic-looking baby boy who is a 50 day-old, 6500gr. He has been getting 9 mg/kg/min. glucose infusion. 80% pancreatectomy.was applied. The patient, whose postoperative hypoglycemia has been continued for 21 days, was taken into the operation again and 95% pancreatectomy was applied overall.

Case4: The male patient, who is a 75 day-old, 5350 gr. He has been getting 13mg/kg/ min glucose infusion. 97% pancreatectomy was applied. He has been under streptozosin, nifedipine and prednisolone, diazoxide, somatostatin therapy.

- Anaesthetic plan

To ensure vascular access, central catheterization ,arterial cannulation has been conducted to the babies whose vascular access is very difficult. Lumbar epidural catheter was put into the cases; except one was unsuccessful because of the anatomical difficulties in case 1. Peri-operative and post-operative local anesthetic infusion was also applied. Blood sugar, hemodynamic parameters, body temprature and urine excretion were recorded at fifteen minute periods when they were taken to the operation room (2).

- Description of incident / problem

In spite of high dose glucose infusion, most of the time; the permanent neurological damage occurs at the cases with hypoglycemia until the diagnosis is done. Under anesthesia, many factors like hypothermia , acidosis , hypovolemia , surgical stress deteriorate the balance effecting the blood glucose. In addition to close invasive

monitoring , blood sugar has been *measured* at frequent intervals in order to satisfy fluid needs and to ensure urine excretion and glucose regulation.

- Solving the problem

According to the obtained measurement results, as the amount of the pancreatic resection gets closer to the 90-95%, blood sugar level increased. Therefore, glucose infusion was gradually reduced. At about 250-300 mg/dl level, it's been switched to the insulin infusion. Serum sale, KCL and Ca in 10 or 20 % Dextroz was preferred as maintenance fluid. Blood losses have been recovered by eritrocyte suspension.

Lessons learned and take home message

The anaesthetic management depends on biochemical vigilance for safety in addition to other monitoring. Fluid management to maintain mild hyperglycemia in spite of changing levels of insulin during the labil perioperative period is challenge which requires teamwork between anaesthesiologist surgeon and neonatalist.

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0026 Intravenous ketorolac versus intravenous acetaminophen as preemptive analgesia in pediatric patients

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Background

Acetaminophen is the most commonly prescribed analgesic for the treatment of acute pain. The efficacy and safety of i.v. formulations of acetaminophen is unclear in pediatric patients. This study aims to investigate the effect of preemptive intravenous acetaminophen compared with ketorolac for postoperative pain control.

Methods

30 children ASA I-II, aged 1-8 years old undergoing lower abdominal surgery were placed into two groups. Group K (n. 15 patients) received intravenous ketorolac 1 mg/kg and Group P (15 patients) received acetaminophen 15 mg/kg both as preemptive analgesia. Induction was performed with propofol or sevoflurane followed by balanced anesthesia with sevoflurane, Air/O₂ mixture, fentanyl and ventilated by laryngeal mask airway. Heart rate, systolic and diastolic arterial blood pressure, SpO₂, RR, ETCO₂ were monitored. Postoperative analgesia was evaluated with CHIPPS scale within six hours after surgery.

Results

13 patients of Group K had adequate analgesia and did not require additional drugs versus 11 patients of Group P for which more rescue analgesics were required during the postoperative time. Heart rate, ECG, systolic and diastolic arterial blood pressure, SpO₂, RR and urinary output were all within the normal ranges and no respiratory changes were reported in all groups. Monitoring of hematological parameters showed no significant changes. There was no bleeding from nasogastric tubes, surgical wounds and blood withdrawal sites in all groups. None of the patients complained of postoperative nausea or vomiting.

Discussion

A few studies comparing i.v. acetaminophen versus i.v. ketorolac for preemptive analgesia have been published and the evidence is conflicting. Anyway, our study demonstrated that ketorolac reduce postoperative pain intensity and the number of patients requiring analgesic rescue medication. Moreover, total analgesic consumption showed a significant reduction during the postoperative time into Group K. Preemptive acetaminophen was ineffective in almost children that required additional doses of analgesics.

Conclusions

Ketorolac can be used as a valid, effective and safe preemptive analgesia to treat postoperative pain without an increased risk of complications.

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0028 Advantages in minimally invasive endoscopic craniosynostosis surgery

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Introduction

Craniosynostosis is a premature prenatal closure of one of the calvarial sutures. This results in an abnormal head shape and facial deformities in infants. Classical corrective surgery is associated with significant morbidity. Lately an increasing experience is obtained in minimal invasive endoscopic surgery. Advantages of this technique are a lesser burden to the patient, few complications and faster discharge. The present study was undertaken to document perioperative anaesthesiological management and complications for these endoscopic procedures.

Methods

Forty-five patients planned were included in this study. They electively received general anaesthesia with sevoflurane and an opioid. Retrospectively all the available automatic and written medical records were reviewed for: blood loss, blood transfusions, duration of anaesthesia and surgery, time spent in the recovery room and ICU, hospital stay and postoperative complications. We recorded peroperative data from standard monitoring. These data were analyzed using Excel. Statistical analysis was done using the SAS' (Statistical analyzing system) means procedure and the chi-square test for frequencies.

Results and Discussion

Forty-five infants (37 male, 8 female), with mean age 3.9 months (SD = 1.1), weight 6.5 kg (1.2) were studied. The patients were positioned prone (28/45) or supine (16/45) depending on the location of surgery. Mean duration of anaesthesia was 152 min (32), surgery 67 min (24), stay in the recovery room 47 min (48). Table 1 shows the main peroperative physiological changes. Changes in heart rate (HR) were mostly at the time of induction and at the time of awakening. As judged by the clinicians none of these changes needed major intervention. There was no significant hypotension. The only intervention needed was volume replacement 99.3 ml (41.7) with crystalloids or colloids. Two patients were shortly hypoxic during intubation. Blood loss was 38.9 ml (30.7). Nevertheless, 14 patients received a blood transfusion postoperatively on the ward, mostly due to haemodilution and haematoma. There were only 4 ICU admissions postoperatively, the first three planned because of the new technique and one patient with the syndrome of Apert due to episodes of lower preoperative SpO₂. There were no life-threatening postoperative complications and no patient needed a second surgery. The most common postoperative complications were fever (10/45), haematoma (3/45) and upper respiratory tract infection (2/45). Nine patients experienced PONV.

Most patients were discharged from the hospital after 2 days (1.2). Hospital stay was significantly longer in patients with complications $P < 0.005$.

Table 1: Perioperative changes

<i>HR changes 20% from baseline:</i>	
Yes	13 (29%)
No	32 (71%)
<i>Mean Blood pressure: mmHg</i>	
T1 (first BP measured)	59.2 (12.9)
T2 (BP during incision)	47.8 (7.6)
T3 (BP 30 min after incision)	48.4 (8.7)
T4 (BP at end of surgery)	51.4 (10.9)
<i>Hypoxia:</i>	
SpO2 < 90%	15 (33,3%)
SpO2 < 80%	2 (4.4%)
<i>Temperature (°C):</i>	
36 - 38	37 (82.2%)
< 36	8 (17.8%)

Conclusion

Early endoscopic treatment is relatively safe, with short surgery time and hospital stay. There was minor perioperative blood loss. No life-threatening complications occurred.

0031 Retrospective study of unplanned admissions to pediatric intensive care unit (PICU) after general anaesthesia.

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Introduction : Up to now, safety studies in paediatric anaesthesia were based either on the incidence of cardiac arrests (1) or on voluntary reporting of all complications. Unplanned admission in intensive care unit (ICU) has been validated in adults as a measure of patient safety in surgical patients (2). Analysis of unplanned admissions to intensive care allows to detect objectively the majority of serious complications, to determine their origin (anaesthetic, surgical, mixed), their iatrogenicity and their possible prevention. The aims of this retrospective study are to determine age groups, surgeries and techniques for increased risk of unplanned admission to PICU; to compare our results with those published in the literature (3); and to develop a system for prospective collection of these cases, so as to realize an annual survey and analysis likely to release information in order to reduce the incidence of unplanned admissions.

Methods: After ethical committee approval, the records of patients under 16 years admitted to the PICU of our institution from 1999 to 2010 were reviewed. We included all patients undergoing a procedure under general anaesthesia in our institution and whose admission to PICU was unplanned preoperatively. Any admission more than 24 hours after the procedure was excluded. For each case, the patient's age (months old), ASA score, procedure undergone, type of incident that prompted the admission, the origin of the incident (anaesthetic, surgical, or mixed) and the timing of the decision of admission (in the operating room, recovery room or in the ward) were determined.

Results: 85 children were admitted to PICU, on a total of 44,559 pediatric procedures under anaesthesia during the study period, or 0.19%. 67% of these children were under 5 years. The distribution of ASA scores from 1 to 4 was respectively 13%, 47%, 39% and 1%. 49% had an anaesthetic origin, 37% surgical and 13% had a mixed origin. The complication was a respiratory problem or included airway management in 44% of cases. 29% of admissions followed a cardiac catheterization procedure. In 62% of cases, the decision for PICU admission was taken while the child was still in the operating room.

Discussion: We found a PICU admission rate to that published by Kurowski et al. (3) although they included only unplanned admissions due to complications of anaesthesia. An unplanned admission in PICU after general anaesthesia remains a rare event. In our series, children were most often less than 5 years and have at least one comorbidity (ASA > 1). The main cause was respiratory. Cardiac catheterization is the procedure most frequently involved.

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0032 COMPARISON OF THE EFFECTS OF ROCURONIUM AND ATRACURIUM ON INTUBATION TIME, INTUBATION CONDITIONS, DURATION OF NEUROMUSCULAR BLOCK AND RECOVERY

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Introduction:

Muscle relaxant drugs which enabled muscle relaxation -one of the most important cornerstones of anesthesia- to be performed routinely in practice of anesthesiology, become one of the main components of this practice. Muscle relaxants are used in pediatric anesthesia as well as adult anesthesia to obtain adequate muscle relaxation for intubation and operation. The aim of this study is to compare the effects of 2 different muscle relaxants on neuromuscular block, intubation quality and recovery.

Method:

After approval of local ethics committee, 2 randomized groups were constituted with ASA I, 60 cases aged between 1-7 years who admitted to Şişli Etfal Education and Research Hospital Pediatric Surgery Clinics for elective lower abdominal and urogenital surgery. Starting with maximal block, the stages of recovery from the effects of muscle relaxant was examined by TOF follow-up with 12 second intervals. The times to reach maximal blockade (seconds)(TOF0), 25% (TOF25) and 75% (TOF75) of TOF value after maximal block were recorded by using TOF Watch SX (Organon Technica) .“SPSS for Windows 13.0” statistical package program was used to evaluate the data. Comparisons were made by using Student’s t test and Chi-square test.

Results and Discussion

In our study it was observed that, TOF 0, TOF 25 and TOF 75 times were 87.38 ± 20.93 sec, 24.48 ± 6.41 min, and 38.77 ± 8.24 min, respectively in Rocuronium group, whereas they were 119.30 ± 23.32 sec, 33.13 ± 4.13 min, and 51.37 ± 1.95 min in Atracurium group. Rocuronium resulted in statistically significantly shorter times in all TOF values with respect to atracurium. There were no statistically significant differences between the groups in terms of operation time, doses of other used drugs, and quality of intubation. Comparison of drug-induced complications between the groups showed that allergy and bronchospasm complications were seen in 4 patients of atracurium group whereas the patients in rocuronium group showed no complications. This difference was statistically significant. It is aimed to choose the better neuromuscular blocker with rapid action which leads to sufficient muscle relaxation during operation and also leads to rapid and safe recovery. These neuromuscular blockers may show different pharmacokinetics and pharmacodynamics in children with regard to adults. Therefore, additional aim was to avoid of excess doses and different administrations. Muscle relaxant agents are distributed in extracellular space and they constitute lower plasma concentrations in

children when compared to adults. Therefore, to reach a similar neuromuscular block level in children, a higher muscle relaxant dose may be needed.(1) It is stated that neuromuscular blockers lead to a faster recovery period in pediatric patients when compared to adults. Possible reason of this may be the more rapid distribution of the drug in affected areas due to higher cardiac output per kilogram of body weight in children.(2)

Conclusions : In this study, we evaluated pediatric outpatients underwent lower abdominal surgery or urogenital surgery. In our hospital, pediatric surgery operations especially lower abdominal and urogenital interventions mostly last shorter than 1 hour. Most of the patients are discharged from hospital in the evening of the operation day.

It is concluded that in short-duration operations of outpatient pediatric surgery cases such as patients of our study, rocuronium may be used safely due to its short recovery period, rapid start of action, and lower rate of allergic reaction development.

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0033 Temporomandibular joint ankylosis in an infant: a rare cause of difficult airway

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Pre-assessment data of the patient and indication for surgery

A 2-year-old boy, weighing 15 kg was admitted with a history of limited mouth opening (inter-incisor distance of 6mm), hypoplastic and retrognathic mandible (with bird face deformity) and facial asymmetry from left temporomandibular joint ankylosis. ENT examination revealed adenotonsillar hypertrophy. He was born at term, after an uneventful pregnancy, and there was no report of trauma during caesarean section. No other possible aetiologies were identified. He was scheduled for mandibular osteotomy.

Anaesthetic Plan

A fiberoptic nasal intubation was performed under deep inhalation anaesthesia with sevoflurane, with the patient breathing spontaneously. Midazolam (0.05 mg.kg⁻¹) and alfentanil (0.03 mg.kg⁻¹) were given and anaesthesia was maintained with O₂/air and sevoflurane. No neuromuscular blocking agent was administered since the surgical team needed facial nerve monitoring.

Description of incident/problem

During surgery an accidental extubation occurred and an attempt was made to re-intubate the trachea by direct laryngoscopy. Although the osteotomy was nearly completed, the vocal cords could not be visualized (Cormack-Lehane grade IV laryngoscopic view).

Solving the problem

Re-intubation was finally accomplished with the flexible fiberscope and the procedure was concluded without any more incidents. Extubation was performed 24 hours postoperatively with the patient fully awake. After surgery, mouth opening improved to inter-incisor gap of 15 mm.

Lessons learned and take home message

Two airways issues are present in this case that can lead to difficult ventilation and intubation: TMJA and adenotonsillar hypertrophy. These difficulties were anticipated and managed accordingly. The accidental extubation brought to our attention the fact that, even after surgical correction, this airway remains challenging. Even with intensive jaw stretching exercises there is a high incidence of re-ankylosis, especially in younger patients. One should bear that in mind when anaesthetizing patients with TMJA.

0034 Total intravenous anesthesia in a rare disease: King-Denborough syndrome

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Background

The King-Denborough syndrome (KDS) is a rare congenital myopathy with musculoskeletal abnormalities definitely associated with susceptibility to malignant hyperthermia (MH). It is also associated to skeletal abnormalities and dysmorphic features with characteristic facial appearance. We describe the anesthetic management of a children affected by this disease underwent to genitourinary surgery.

Case Report

A 6 year old male, suffering from KDS, was presented for surgical treatment for genitourinary surgery. He had marked ptosis, down-slanting palpebral fissures, hypertelorism, epicanthic folds, low-set ears, malar hypoplasia with micrognathia and pectus excavatum. Neurological examination showed normal intelligence. Muscular hypotonia and bilateral facial weakness was not observed. Serum creatine kinase levels were normal. No premedication was administered. General anesthesia was induced with fentanyl 2 mcg/kg and propofol 3.5 mg/kg and intubation performed without muscle relaxants. General anesthesia was maintained by a continuous infusion of 150 mcg/kg/min propofol and 0.25 mcg/kg/min remifentanyl with Air/O₂ mixture (FiO₂ = 0.4) by IPPV. Core temperature was measured via the distal esophagus. No complications were observed during the operation. SpO₂ was 99%, ETCO₂ 32 mmHg, HR 92 bpm, esophagus T. 36.5 ± 0.5 °C. At the end of surgical procedure the child returned rapidly to a spontaneous breathing and was extubated without SpO₂ desaturation.

Conclusions

Our report suggests that a continuous infusion of propofol plus remifentanyl without muscle relaxants is a safe anesthetic technique for the children affected by KDS undergoing surgical treatment for genitourinary surgery. This anesthetic management dramatically reduces the risk for MH and respiratory depression.

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0035 Tranexamic acid for major spinal surgery in children. A retrospective study.

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Introduction Paediatric patients who undergo posterior spinal fusion surgery to correct scoliosis often require multiple blood transfusions. Tranexamic acid is a synthetic antifibrinolytic drug that reduces transfusion requirements in scoliosis surgery (1), (2), (3).

Methods

To evaluate the efficacy of prophylactic tranexamic acid (TA) (initial dose of 10mg/kg and infusion of 1mg.kg(-1).h(-1)) in reducing perioperative blood transfusion requirements, we reviewed patients files and compared the amount of blood lost and blood transfused in the perioperative period of 12 patients that received TA and 10 patients who did not received TA. T-student test was applied.

Results

The average difference of blood losses (2,67 +/- 6,06 ml) and blood transfused (212,9 +/- 101,1 ml) between the two groups was not statistically significant (p>0.05). No thrombotic complications were detected in either group.

Discussion: Intraoperative administration of tranexamic acid (10 mg/kg bolus + infusion of 1 mg. kg(-1). h(-1)) does not reduce blood loss and blood transfusion during spinal surgery in children with scoliosis.

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0037 Regional Anaesthesia: a Paediatric Centre Experience of 1273 Cases

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Introduction

Regional anaesthesia has become an important part of paediatric anaesthesia. It probably represents the most effective way of providing pain relief in children of all ages and physical status ^[1]. From the many techniques and drugs available, caudal block, bupivacaína and fentanyl were the most popular in a United Kingdom survey in the year 2002 ^[2]. Since then, anaesthesia practice has evolved and new drugs and procedures are now more accessible. The aim of this study is to characterize the clinical practice of regional anaesthesia in a Paediatric Centre.

Methods

A descriptive retrospective analysis was conducted, using a 3 year record (2008-2010) of 1273 patients in whom regional anaesthesia techniques were performed.

Results

A total of 14479 patients had surgery during the referred years. A regional block was performed in 1273 patients (8,8%). From these, 67,0% were male, 32,8% were female and 0,2% were not recorded. Age distribution was the following: 1 to 30 days old - 0,2%; 30 days to 1 year old - 7,8%; 1 to 12 years old - 70,7%; 12 to 18 years old - 20,7%; cases missing - 0,5%. ASA I was attributed to 58,9%, ASA II to 33,8% and ASA III to 5,7% children. ASA classification was missing in 1,6%.

Considering the total number patients submitted to regional techniques, 41,9% had orthopaedic surgery, 27,1% had general surgery, 21,8% had urologic surgery, 7,1% had plastic surgery, 2,0% had otolaryngologic surgery and 0,1% had neurosurgery. When it comes to the number of regional techniques *per* number of surgical procedures for each speciality, orthopaedics, urology and plastic surgery were the most significant with 22,1%, 20,4% and 9,6%, respectively.

In 14 of the 1273 patients, two different regional techniques were performed, which accounts for a total of 1287 blocks [64,8% neuraxial blocks and 35,2% peripheral blocks]. Lumbar epidural was the most widely used procedure 50,3% followed by abdominal wall blocks 13,4% and caudal anaesthesia 13,0%.

Local anaesthetic was used in 1240 cases, ropivacaine being the most common option (94,0%). From the 760 patients who were administered an adjuvant drug, sufentanyl was the most commonly used (61,7%), followed by morphine (36,9%).

Discussion

In our Paediatric Centre, lumbar epidural block and ropivacaine are the common practice. In view of the numerous advantages of regional anaesthesia, a value of 8,8% of regional blocks performed, from a total of 14479 surgical procedures, seems quite disappointing.

Reasons for the somewhat underuse of these techniques is a matter for future studies. Recent introduction of ultrasound guidance in this Centre is expected to increase the use of peripheral blocks.

Lack of records has contributed to the unintentional exclusion of some patients (not mentioned on the record book), while incomplete data may have led to inaccurate results.

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0038 Pediatric ultrasound regional blocks survey: what's new?

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Introduction

Currently, regional anesthesia has divided the pediatric anesthesiologists' preferences about the use of ultrasound techniques (1). Although it is still underused, in a lot of countries ultrasound is already the technique of choice. The objective of this study was to determine the motivation about the choice of anesthesiologists regarding the use of regional echoguided techniques.

Methods

To select the population, we made a list of electronic addresses of pediatric anesthesiologists from USA, Europe, Asia, Canada and South Africa. A questionnaire was sent to 350 anesthesiologists. The concordance and discordance of each item were compared by z tests (consensus if $p < 0.05$). The invitation to participate in the study was made by an e-mail containing the link for the electronic questionnaire. The electronic version of the questionnaire was created using Macromedia Dreamweaver MX (Macromedia Inc., USA) and placed it in a website. The messages from the initial invitation that were returned were substituted successively by other members of the list until we reached the minimum pre-established number of participants, resulting in the participation of 250 anesthesiologists. The questionnaire contained 10 items measured in a 5-point Likert scale (5 = strongly agree; 1 = strongly disagree) about costs, quality, easiness of technique, knowledge of ultrasound regional anesthesia versus neurostimulation and choice of the needle. It also contained places for the following demographic data: age, gender, length of time practicing regional anesthesia and how often it is used (always/frequently or rarely/never).

Results and Discussion

Among the positive factors regarding the use of ultrasound was the quality and safety of the block, the trust in the future development of needles, and the willingness to learn and perform the techniques. Those who participated in our study demonstrated that the availability of more ultrasound equipments could contribute to the widespread use of echoguided blocks. The number of participants that mentioned the need of equipments as limiting factors for its use is similar to those who disagree, showing a lack of consensus about the economic aspects of regional ultrasound anesthesia. We concluded that the

attitude of pediatric anesthesiologists and residents regarding the use of ultrasound are predominantly positive; that the quality, precision and safety of the block was identified as a factor that stimulates the choice of the technique; that there is no consensus regarding concerns about the costs or about the availability of special equipment for its use; that there is interest in learning the technique as well as using the technique more often, suggesting that there is a place for courses, workshops, and other institutional tools in the field of echoguided regional anesthesia.

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0039 A different way to perform anesthesia in preterm infants avoiding tracheal intubation

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Introduction

The incidence of inguinal hernia is higher in premature infants, particularly in low birth weight neonates. They may incur increased postoperative respiratory complications with a higher risk of postoperative apnea and bradycardia if general anesthesia is performed. Caudal anaesthesia (1) under sevoflurane sedation and ventilation through laryngeal mask airway is associated with high success rates and low incidence of complications.

Materials and Methods

We evaluated retrospectively our anaesthetic technique on the latest 73 former preterm infants of less than 50 weeks postconceptional age and underwent surgical hernia repair. The mean gestational age was 32 weeks (range 25 - 36 weeks) and 33 infants had a birth weight less than 2000 g. Sedation and assisted ventilation was performed and maintained only with sevoflurane in air/O₂ to provide ideal conditions for managing the airway without supplemental opioids or muscle relaxants. Laryngeal mask airway size 1 was easily inserted in 68 patients while in 5 infants orotracheal intubation was necessary because of inadequate ventilation and O₂ desaturation. Infants were positioned in left lateral decubitus and a caudal block with levobupivacain 0.25% was performed.

Results

All blocks were successful also thanks to the help of ultrasound guidance for those infants for which caudal space were not identifiable with the traditional technique. Assisted ventilation through laryngeal mask airway was efficacy and safe although opioids and muscle relaxants were not administered. Only in 5 infants orotracheal intubation was necessary because of repeated displacements of laryngeal mask airway accompanied by O₂ desaturation. In all 68 preterm infants an excellent hemodynamic and respiratory stability together with optimal intraoperative and postoperative analgesia were observed without adverse effects. The infants were calm in the postoperative period, without increasing incidence of respiratory complications, motor block or urinary retention. Moreover, in all infants a reduced postoperative fasting time was observed.

Discussion and Conclusions

This experience suggested that caudal block with laryngeal mask airway, without intravenous administration of muscle relaxants and opioids provided excellent intraoperative and postoperative analgesia. Moreover, this study allowed to demonstrate that orotracheal intubation was not necessary in preterm infants undergoing hernia repair.

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0043 Analgesic efficacy and its side effects following pectusrepair

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Introduction:

Surgery for pectus deformity is commonly done in adolescence. The 2 most common operations performed are the Ravitch and the Nuss procedures. The Ravitch is an open procedure normally associated with less pain than the Nuss which is a thoracoscopic procedure. Surgical complications are rare after both procedures, however producing good pain relief can be a significant challenge for the anaesthetist.

The aims of this audit were to look at our current analgesic management, focussing on efficacy and complications, particularly relating to epidural analgesia done for a cosmetic procedure.

Methods:

Following audit department approval data was collected retrospectively on all patients who had undergone pectus surgery from 2007 to 2010. Data was collected from the pain service database, patients' notes and the hospitals Meditech computer system. All the results were collated and input to Microsoft Excel, which was also used to present the data in a graphical format.

Results:

Data from 47 patients with an average age of 15 years was collected. 26 patients had pectus excavatum and 21 had pectus carinatum. All patients initially received epidural analgesia. Duration of epidural analgesia ranged from <24 hours to 7 days. Median duration was 5 days (12 patients). Post operatively patients received the following analgesia; epidural only (10), epidural and PCA (14), epidural and ketamine (8), epidural, ketamine and PCA (15). The average resting post-operative pain scores whilst on an epidural were the following; day 0=4.0, day 1=3.5, day 2=2.6, day 3=2.4, day 4=1.9, day 5=1.4. The average resting pain scores after stopping the epidural were; after day 1=3.7, day 2=3.1, day3=2.7, day 4=3.0. Of the patients receiving an epidural 12 suffered a failure of the epidural within 48 hours, defined as inadequate analgesia or epidural displacement. All of these patients had to receive an opioid PCA, for an average duration of 3.4 days. A further 8 patients received a ketamine infusion to help control the pain. 12 patients had signs or symptoms of a high block, including Horner's syndrome, ptosis and paraesthesia or weakness of the upper limbs. This was associated with patients who had an epidural inserted at T6/7 or higher (11 patients) and if the epidural was run at 15ml/h (8 patients). No patients suffered respiratory depression and no serious adverse effects were found. Patients whose epidural was used for less than 48 hours (12 patients) had an average length of stay (LOS) of 6.7 days, as compared to patients whose epidural was used for 6-7 days (12 patients) where the average LOS was 8.3 days.

Discussion:

Epidurals are effective for post-operative pain relief after pectus surgery. Important

complications may occur including a high block and Horner's syndrome. These are more likely with an epidural placed at T6/7 or higher and at infusion rates of 15 ml/h. Epidurals continued for 6-7 days may increase overall length of hospital stay. Introduction:

Surgery for pectus deformity is commonly done in adolescence. The 2 most common operations performed are the Ravitch and the Nuss procedures. The Ravitch is an open procedure normally associated with less pain than the Nuss which is a thoracoscopic procedure. Surgical complications are rare after both procedures, however producing good pain relief can be a significant challenge for the anaesthetist.

The aims of this audit were to look at our current analgesic management, focussing on efficacy and complications, particularly relating to epidural analgesia done for a cosmetic procedure.

0046 A Child with Staphylococcus pneumonia, complicated by destruction of the lower lobe of the left lung

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Background. Underlying respiratory infection with RSV or adenoviruses has been associated with severe course of bacterial pneumonia in both immuno-compromised and –competent children.

Case report. A previously healthy 2 years and 6 months old girl weighing 15 kg had been ill for 4 days with fever, rhinitis cough and dyspnea from the third day of illness. On admission to PICU she was somnolent with greyish skin colour and major respiratory insufficiency. She was intubated and mechanically ventilated with high peak inspiratory pressure and FiO₂ 100%. X-ray of thorax revealed lobar pneumonia progressing to ARDS. She was treated with surfactant twice with little or no effect on oxygenation. To maintain adequate circulation volume replacement, dobutamin, dopamin and epinephrine infusion was required . On the second day of treatment inhaled NO was started for worsening pulmonary hypertension. Pyothorax was drained on both sides. On Day 3 and 8 tension pneumothorax required additional drainage on left side. As massive air- leak from the left pleural space compromised ventilation, bronchoscopy and segmental bronchus obturation with excellent air leak control was performed on Day 10. For pulmonary hypertension sildenafil was added. On Day 16 CT of lungs showed destruction of the entire left lower lobe. As air leak control by bronchial obturation was unsatisfactory by that time, on the 20th day thoracotomy with removal of the left lower lobe and resection of lingula was performed. Histology revealed necrotic-phlegmonous inflammation with signs of carnification. Postoperatively she had two episodes of pneumothorax on the right side. At first airleak ceased after extubation on Day 38 but after 2 days right pleural drainage for 10 more days was required. Her further recovery was uneventful. She was discharged from PICU on full enteral nutrition with transcutaneous saturation 92-93% without oxygen therapy

Discussion. Additional tests ruled out immune deficits, cystic fibrosis and other possible aetiologies of pneumonia (pertussis, Chlamydia etc) in our patient. Although associated with higher infection rate and bronchial haemorrhage in adult COPD patients, short-term use of bronchial obturator did not cause any complications in our patient. Histology still revealed some giant cell reaction characteristic to presence of foreign body.

Conclusion. Respiratory viral illness may be complicated by severe bacterial pneumonia also in previously healthy children.

What can we learn from this case? Bronchial obstruction can be successfully used for control of massive air-leak compromising ventilation in children. Early surgical removal of severely affected pulmonary tissue may be considered when no hope for restoration of gas exchange function remains.

0047 Anesthesia in children for short thoracoscopic operation

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Introduction.

The number of thoracic operations performed by using of a modern thoracoscopic method has been growing recently all over the world

Methods.

Analysis of anesthesia and surgery was performed in 63 patients aged 5 to 17 years the period from 2008 to 2011. They had thoracoscopic operations on the lung malformations, diaphragmatic hernia, three-dimensional entities and foreign bodies of the mediastinum and light performed under general anesthesia with one-lung ventilation (OLV). During OLV endotracheal tube ventilation was provided for in the right or left principal bronchus before CO₂ was insufflated into pleural cavity. Sevofluran in 34 children and izofluran in 29 patients in combination with intravenous fentanyl at a dose of 4 mkg/kg/hour was used for basic stage of anesthesia.

Results.

Duration of operation and anesthesia has not exceeded 160 minutes and was 58.7 ± 16.7 minutes. After induction anesthesia and beginning of maintenance period of anesthesia endotracheal tube position was changed to the right or to the left main bronchus and tidal volume was reduced from 8.2 ± 0.67 mL/kg to 5.04 ± 0.86 mL/kg. FiO₂ was increased from 0.6 to 1.0. Carbon dioxide pressure in the pleural cavity was maintained at the level of 5-6 mm Hg. Duration of carboxythora was $32 \pm 12,5$ minutes.

Right after the beginning of OLV compliance decreased as following: children 5-8 years from 13.5 ± 2.98 to 6.3 ± 1.85 ml/cm H₂O, children aged 9 -12 from $40,3 \pm 15,6$ to $13,4 \pm 6,2$ and children 12-17 years from $38,4 \pm 6,34$ to $19,07 \pm 5,6$ ml/cm H₂O. At the same time no significant changes in the dates of ETCO₂ during the carboxythora was noticed.

The evaluation of the depth of anesthesia was held via analysis of Auditory Evoked Potentials and AAI. After main stage of surgery and removal of carbon dioxide from chest cavity delivering the position of endotracheal was changed providing ventilation in both lungs.

Discussion.

Despite notable decreasing of compliance were no changes of ETCO₂, PaO₂, PaCO₂ and SaO₂. There was no growing pressure on inspiration when using mechanical ventilation due to the reduction of the tidal volume. Short duration OLV does not lead to lung bypass. At all stages of anesthesia there were no significant changes of hemodynamic and gas exchange. The index of pulmonary complains before the tracheal extubation corresponded to the original figures. The extubation of tracheal was conducted in 19 ± 5.8 minutes after the surgery was over depending on the patient's own breath and the index of AAI.

Conclusion.

The OLV can be conducted in the short thoracoscopic operation. The carbon dioxide pressure in the pleural cavity shall not exceed 6 mm Hg in children under general anesthesia. Under these conditions no significant changes in ventilation of hemodynamic and gas exchange are noted.

0049 How useful is transversus abdominis plane block for intra and postoperatoru analgesia.

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Background and aims:

There have been Published many recent studies evaluating the efficacy of TAP block for postoperative analgesia. Transersus Abdominal Plane (TAP) block is a new aneaesthetic technique whose aim is toblock anterior branches of toracholumbar nerves originating from T6-L1, which inervates anterior abdominal wall, by introducing local anethetin to neurovascular plane between the internal oblique and the transverses abdominal muscles. Ultrasound is a useful device to identify anatomical landmarks. We aim to evaluate efficacy during the intraoperative period (IO) for open surgery (herniorrhaphy and orchiopexy).

METHODS.

Ninety-six paediatric patients (ASA I to III) undergoing open surgery where randomized in two groups.

Group A (n=50): inguinal or abdominal herniorrhaphy under inhalatory anesthesia without opioids, and after induction TAP block unilaterally performed (levobupivacaine 0,25%, 0,25 ml/kg).

Group B (n=46): orchiopexy after induction a unilateral TAP block was performed (introducing levobupivacaine0,25%, 0,25 ml/kg).

Fentanyl 1mcg/kg i.v. was given if arterial blood pressure (ABP) or cardiac frecueny (CF) or both rise >20% from basal values (ABF and CF at 5 min post induction). Each patient was assessed at 30 min and 24 h after surgery.

Both groups received acetaminophen and non-steroidal anti-inflammatory drugs in the introperative period.

RESULTS

In our preeliminary results (group A=20 patients, group B=8 patients)US guided TAP block significantly reduced intraoperative fentanyl consumption (the fact was during the preliminary study none of the patients needed fentanyl neither intraoperative nor postoperative). Postoperative VAS pain scores were acceptable in both groups, it meant it was < 2 at 30 min. and 24 hours later with no cries in any patient, no patients had secondary motor blocks allowing them to be discharged home during the next 4 hours after surgery.

CONCLUSIONS

US guided TAP block is a useful technique in the IO and PO pain management of paediatric patients undergoing open abdominal wall surgery.

0050 Cortisol, Leptin and a Blood Sugar as a Good Stress Indicator During General Anaesthesia with Different Opioid Analgetics in Children

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Introduction: A stressful response to an operation is followed by increased secretion of the hypophysis hormone and by activating the sympathetic nervous system. Cortisol is considered to be the most significant mediator to stress reaction. Cortisol has complex effects on the metabolism of carbo-hydrates, fats and proteins. Leptin is a hormone discovered in 1994. The balance of leptine and hypothalamo-hypophysis-adrenaline axis has a clinical significance. In the early stage of stress the level of leptine decreases with the subsequent increase of the cortisol level.

The level of glucoses becomes directly proportional to the level of catecholamine in the blood, and it is also proportional to the intensity of the surgical intervention. Opioid analgetics during the anaesthesia have the leading role in the modulation and suppression of the stress response to a surgical trauma.

Aim: The aim of the study was to determine which of the applied opioid analgetics brings the most powerful blockade of the stress response with the smallest side-effects in children.

Methods: Clinically prospective study included 150 boys, aged 2-5 years, belonged to the ASA I and II group, who had herniectomy or orchidopexy, as a part of a day surgery. The introduction into anesthesia was equal – propofol (2,5 mg/kg), rocuronium (0,6 mg/kg) and bolus dose of opioid analgesics. Maintenance of anaesthesia was – continuous propofol infusion, rocuronium application as a relaxant; the respiratory way was maintained by laryngeal mask and the ventilation was controlled or assisted by the mixture of oxygen/air (50%:50%). The examinees were divided into three groups of fifty depending on the applied opioid analgesics (fentanyl, alfentanil, remifentanil).

Results: The fentanyl group has the highest glucosis values in the blood. The examinees of fentanyl group had the highest increase in the cortisol level in the blood at the moment of incision and awakening time. The lowest increase in cortisol was recorded in the remifentanil group. A significant decrease in leptin was registered at the moment of awakening in the fentanyl group and in the remifentanil group at the moment of incision.

Conclusion: From the results we may conclude that the remifentanil is the opioid analgetic with the highest suppressing effect on the stress response to surgical intervention in children.

0051 PERIOPERATIVE ANAPHYLACTIC SHOCK. A CASE REPORT.

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INTRODUCTION

Anaphylaxis occurring during anaesthesia is a rare but potentially life-threatening complication [1]. We present a case of a 10 year old girl who developed anaphylactic shock during surgery due to penicillin.

CASE REPORT

A 10-year-old female, who suffered from neurogenic bladder, was scheduled to undergo bladder augmentation. The patient had received penicillin at the ward prior to her admission. General anaesthesia was induced with fentanyl 3µg*kg⁻¹, propofol 3mg*kg⁻¹ and rocuronium 0.6mg*kg⁻¹ iv and was maintained by sevoflurane 2-3%. Forty minutes after induction and 5 minutes after incision there was a sudden fall of the arterial pressure to 50/35mmHg, an increase of the heart rate up to 143bpm and oxygen desaturation. Rale and wheezing were heard during auscultation of the lungs and there was a rise to PIP. SpO₂ declined to 21% despite attempts to restore previous values. Soon arterial pressure fell to 40/20mmHg and a generalized flushing appeared. Electrocardiogram revealed ST descents.

MANAGEMENT

Administration of sevoflurane was stopped and the patient was ventilated with FiO₂ 1 Mnually. Ringer's Lactated bolus infusion (20ml*kg⁻¹) was given with incremental doses of epinephrine and phenylephrine, Salbutamol was sprayed through the endotracheal tube and continuous intravenous infusion of epinephrin commenced. ABGs: pH 7.23, PaO₂ 67mmHg, PaCO₂ 19.3mmHg, HCO₃⁻ 28mmHg, Na⁺ 138.5mmol/L, K⁺ 4.43mmol/L, Hct 37%, Hb 12.6gr/dL, glucose 138mg/dL, lactate 2.81mmol/L. A trans-esophageal echo cardiogram was performed not showing any pathologic findings. Vital signs started to restore slowly and skin changes receded after administration of antihistamines (H1-antihistamine) and steroids (hydrocortisone) and they returned to normal 2 hours later. The patient underwent full testing on possible allergens. RAST test (Radio-Allergo Sorbent Test) was positive to penicillin and also specific IgE antibodies against penicillin were found in serum at a level of 1310iu/ml (normal range <87iu/ml). The patient was discharged a few days later. The surgery was performed one year later with no complications after all necessary precautions were taken.

DISCUSSION

Anaphylaxis during surgery is rare and also difficult to confirm. NMBAs, latex and antibiotics are the most common causes. Diagnosis is difficult because of the different types of drugs administered. In addition, symptoms may be masked by anaesthesia or they might occur later. Reported clinical features include symptoms from the cardiovascular system, bronchospasm and cutaneous-mucous signs [2]. So it requires a high level of suspicion. Treatment depends on clinical symptoms and manifestations. We suspected that our patient's anaphylaxis had been caused by latex because abnormalities of the urinary system are reported to predispose to

latex-sensitivity [3]. About 7% of the suspected causes are confirmed by subsequent testing, so follow-up investigation to avoid re-exposure of the patient to the cause is necessary [4].

CONCLUSION

This case shows that prompt diagnosis and appropriate treatment are the key factors to a favorable outcome. It is also the anaesthetist's responsibility to guide the patient for further investigation in order to prevent similar incidents in the future.

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0057 Anaesthesia for pediatric mediastinal masses

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INTRODUCTION: The anesthetic management of children with mediastinal masses (MM) is associated with risks and challenges, including potential airway compression and cardiovascular collapse, even in those without symptoms before anesthesia (1,2,3). The aim of this study is to review the anesthetic management and to evaluate clinical signs/symptoms suggestive of cardiopulmonary compromise, radiological evidence of respiratory or cardiovascular compression and anesthetic technique associated with vital complications.

METHODS/MATERIALS: A descriptive, retrospective study was done on patients 2-15 years old with MM scheduled for surgery in our hospital from January 2008 to December 2010. Preoperative evaluation included history, physical examination and diagnostic imaging studies. The anesthesia performed could be divided in four groups: ketamine (K) / sevoflurane (S) /propofol (P)/ muscle relaxant (MR).

RESULTS: We included 18 patients with anterior MM and 7 with posterior MM. Of the 18 patients with anterior MM, 14 had preoperative signs/symptoms and 4 were asymptomatic with radiological vital structure compression. Four anesthetic groups: 4 patients (K)/ 9 patients (S)/ 1 patient (P)/ 11 patients (MR). There were no complications in K group and in S group there was a case of partial airway obstruction. A respiratory collapse happened during propofol induction. In MR group, a case of cardiorespiratory collapse and another one of respiratory collapse appeared. All posterior MM were done under deep anesthesia with MR without any complications.

CONCLUSION: Absence of clinical signs/symptoms and/or radiological evidence does not necessarily imply absence of risk under general anesthesia. We consider that the maintenance of awoken compensatory efforts by the patient with the lightest possible anesthesia is associated with few complications in children with anterior MM.

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0058 Analgesia for children after coblation or cold tonsillectomy

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INTRODUCTION: The techniques used for tonsillectomy have been refined over the years, in effort to reduce morbidity and increase surgical efficiency. Coblation tonsillectomy has been reported to be associated with less thermal injury and post-operative pain (1,2). The aim of this study is to evaluate post-operative pain in children that underwent coblation or cold tonsillectomy.

MATERIALS AND METHODS: This study was conducted as a prospective, randomised, double-blinded clinical trial, in our tertiary hospital. All pediatric patients had a history of recurrent tonsillitis (but not within the 3 weeks prior to surgery) or tonsillar hypertrophy that underwent coblation or cold tonsillectomy. Patients who already were having analgesic treatment or presented post-operative bleeding were excluded from the study. After placement of standard non-invasive monitoring and preoxygenation, patients were induced with atropine 0.01 mg/kg, fentanyl 2-4 µg/kg iv, propofol 3 mg/kg iv and rocuronium 0.5-0.6 mg/kg iv and anaesthesia was maintained with 2 MAC of sevoflurane in oxygen/air (FIO₂ 0.5) and remifentanyl infusion at 0.1-0.2 µg/kg/min iv. Immediate post-operative analgesia was the same for all patients. They were discharged home the same day of operation with oral paracetamol 15 mg/kg/h and ibuprofen 10 mg/kg/h to take on as required during the next 10 days. Patients' parents were given a discharge questionnaire with a visual analogue pain score (3) (on a scale of 1-10 with a corresponding range of facial expressions) to recordodynophagia and we phoned them the days 1, 3, 6, 8 and 10. We also asked the parents to record the day their child returned to a normal diet.

RESULTS: A total of 72 patients were recruited into the study and 2 were excluded. Their ages ranged from 4 to 16 years old. Half of the 70 patients underwent coblation tonsillectomy and the other half cold tonsillectomy. There were not significant statistical differences of post-operative pain score between the two groups.

CONCLUSION: In this study we did not find that coblation group was associated with less post-operative pain score than cold dissection group, so we consider that both surgical techniques are good options for tonsillectomies.

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0060 The Effect of Ultrasound Guided Rectus Sheath Block in Pediatric Surgery Aydın Halefoglu, Aydın Halefoglu¹, Dilek Ozcengiz¹, ¹Cukurova University Medical Faculty, Dept of Anesthesiology and Reanimation, Adana, Turkey

Purpose: In our study, we investigated the effects of the rectus sheath block implemented with levobupivacaine on the consumptions of intra-operative sevoflurane and post-operative analgesic.

Materials and Method: The study was performed after the necessary permissions and approvals had been taken from the parents and Ethics Committee. 40 patients whose ages were between 3-18 and from the group of ASA I-II and who would be implemented abdominal surgery through transverse incision were included into our study. The patients were randomly divided into two groups.

The patients of group I were performed rectus sheath block accompanied by ultrasound guided with (0.25%) levobupivacaine 0.2 ml/kg under general anesthesia before surgical incision. The patients of group II were given 0.1 mg/kg morphine intravenously. For the postoperative pain, the patient-controlled analgesia (HKA) device was set with 0.01 mg/kg bolus and 30 minutes lock period for the both two groups.

Sevoflurane concentration and the amounts those were inspired (%) and used (ml/hour) during the operation and some hemodynamic data such as intra-operative and post-operative systolic and diastolic blood pressures, heart rates and oxygen saturations of the both groups were measured and recorded. The consumption of analgesic with post-operative, pain scores (FLACC), the sedation level, nausea and vomiting, the number of cases which needed additional analgesic and the adverse effects were observed and noted.

Results: The demographic characteristics, the operation periods and hemodynamic parameters of the groups were similar. It was found that the sevoflurane concentrations inspired and consumed in the intra-operative period for the patients of group I were lower than the ones for the patients of group II. The average sevoflurane consumption was 18.7 ± 2.1 ml/hour and 21.5 ± 2.9 ml/hour in group I and II, respectively ($p < 0.001$).

When the post-operative hemodynamic data was compared, it was found that systolic artery pressures were lower in the patients of group I than in the patients of systolic artery pressures were lower in the patients of group I than in the patients of group II and the other parameters were similar.

The post-operative FLACC, the sedation scores and 24-hour cumulative morphine consumption were found lower in the patients of group I than in the patients of group II ($p < 0.01$).

While nausea and vomiting were observed in 3 patients of group II but no nausea and vomiting was observed in any patients of group I. In addition, no need of additional analgesic was needed in any of the patients

Conclusion : Consequently, it was seen that pre-operative sevoflurane consumption and the post-operative morphine consumption –with HKA method were lower in the patients who was implemented pre-operative rectus sheath block than in the patients who was implemented post-operative iv morphine. At the end of our study, we concluded that the implementation of

rectus sheath block accompanied by USG provided an effective and reliable analgesia.

Key words: Pediatric Patients, the Patient-controlled Analgesia, Levobupivacain, Rectus Sheath Block, Sevoflurane, Ultrasonography.

0062 REDUCTION OF THE WHOLE INDUCTION TIME IN PAEDIATRIC ANAESTHESIA USING THE SNORKEL TECHNIQUE WITH SEVOFLURANE PLUS NITROUS OXIDE BOLUS

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BACKGROUND In a previous paper we had already demonstrated the induction of paediatric inhalational anaesthesia using the snorkel technique with sevoflurane to shorten the induction time in children undergoing scheduled surgeries. The purpose of this study is to verify if it is possible to further reduce the induction time by using this technique together with the administration of a sevoflurane plus nitrous oxide bolus as well as to determine if there exists any complication and adverse events associated with this way of inducing anaesthesia in children. **METHODS** Patients: We enrolled three hundred and five children between three and eight years of age requiring anaesthesia for elective scheduled surgeries. ASA class1 patients, whose parents provided written informed consent were included in the trial. Patients were excluded if they required a highly complex surgery and in cases of emergency. The snorkel technique has previously been described. A mixture of sevoflurane 8% plus nitrous oxide is used in this method. With this mixture, the Jackson-Rees system is filled and it is administered by bolus inhalation through the snorkel mouthpiece (nozzle), which is replaced by the conventional mask once induction has been achieved.

Design: It was a prospective, controlled, randomized trial. Patients were randomly assigned to receive either a sevoflurane plus nitrous oxide bolus, or only sevoflurane.

One hundred and fifty three patients served as controls and one hundred and fifty two as the study group. Randomization was carried out after informed consent was provided.

Results: Our results show that induction time in the study group was 17 +/-4 seconds ($p < 0,001$) whereas among controls it was 36 +/-12 seconds. No complications or adverse effects associated with the use of a sevoflurane plus nitrous oxide bolus were detected.

Conclusion: We can conclude that the use of a sevoflurane plus nitrous oxide bolus allows a significant reduction in anaesthetic induction time in children without any undesirable effect.

0064 Bleeding after adenotonsillectomy: a one-year retrospective anaesthesia chart review and analysis

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Introduction: Adenotonsillectomy is one of the most commonly performed paediatric surgical procedures. Among post-operative complications post-adenotonsillectomy haemorrhage is liable to great risks. Incidence rates vary from 0.9% to 2.15%. Although nonsteroidal anti-inflammatory drugs (NSAID) and dexamethasone are frequently used, their administration might increase post-adenotonsillectomy haemorrhage either within 24 hours or 5 to 10 days after surgery (1,2). The majority occurs in the tonsillar fossa (67%). Recently, surgeons at our institution perceived an increase in post-adenotonsillectomy haemorrhage in the nasopharyngeal region. Therefore the aim of this study was: 1. to identify the incidence of post-adenotonsillectomy haemorrhage needing surgical re-intervention; 2. to locate the anatomical site of the bleeding (tonsillar fossa or nasopharynx); 3. to find a possible association with the use of intravenous or rectal NSAID and dexamethasone.

Methods: After approval of the local ethical committee a retrospective analysis was performed on 566 patients who underwent an adenotonsillectomy (n=274) or adenoidectomy (n=292) between July 2009 and June 2010. Data were collected on demographics, type of anaesthesia technique, duration of surgery, use of opioids and administration of acetaminophen, intravenous or rectal NSAID and dexamethasone. The primary end-point was the incidence of haemorrhage in the nasopharynx. Elapsed time to the actual bleeding was also registered. Cases with clotting disturbances and peri-tonsillar abscess were excluded. A multivariate stepwise logistic regression analysis with bleeding in the nasopharynx as the response was accomplished to investigate the impact of possible risk factors such as intravenous or rectal NSAID and dexamethasone.

Results: The overall incidence of post-adenotonsillectomy haemorrhages was 19 (3.3%) of which 11 (57,8%) occurred in the nasopharyngeal region and 8 (42,2%) in the tonsillar fossa. The stepwise logistic regression analysis identified intravenously NSAID as a significant risk factor (table 1).

Table 1

Odds ratio for bleeding in the nasopharyngeal region (n=11)				
		odds	95% CI	P value
NSAID	intravenous	5,8882	1,5433 to 22,4656	0,0095*

Discussion: At our institution overall post-adenotonsillectomy haemorrhage is slightly more frequent than generally reported. The bleeding mainly occurred at the nasopharyngeal site. In our regression model we found a firm association between intravenous NSAID and haemorrhage in the nasopharynx. In accordance with these findings, policy was changed and

NSAID are only administered rectally and after the operation when indicated.

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0065 Premedication of preschool children with alprazolam or midazolam : comparison of induction and recovery characteristics.

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Introduction

The need for routine premedication in children is still challenged. Reduction of anxiety should lead to less post-operative agitation. (1)

Intrarectal midazolam/atropine is the “golden standard” of our hospital, as well as in many other hospitals, but has a number of undesirable effects, such as paradoxal agitation and mnemonic problems. Other benzodiazepines could have advantages in this respect.

We conducted a prospective randomized double blind study in children (aged 1-7 years), scheduled for abdominal wall surgery or superficial urology, to compare alprazolam to midazolam.

Methods

After ethical committee approval and written informed consent of the parents, toddlers were randomly allocated to receive either alprazolam sirup 0,025 mg/kg (group A) at admission on the one day ward (OD), or intrarectal midazolam 0,5 mg/kg with atropine 0.01 mg/kg (group M) 30 min. before induction.

General anesthesia was then performed with sevoflurane induction and maintenance, supplemented with paracetamol (20mg/kg), parexocib (6 mg/kg) and a regional or neuraxial block. Tradonal (2mg/kg) was given in the PACU as needed.

Parental presence was assured at induction and in the PACU.

We compared induction characteristics (ICC score, and intensity of the excitation phase after loss of conscience) and recovery characteristics (pain score, modified CHEOPS and agitation score, PAEDs, both at admission in the PACU and when the child was free of pain. (2,3)

Statistics : nonparametric, comparing independent samples with the Mann-Whitney U test.

Results

Same demographic groups, same surgical and anesthesia conditions.

The induction score was similar in both groups, but the intensity of the excitation phase after loss of conscience was less in group A. Less agitation was observed when pain was not present and time for discharge from PACU to normal ward was shorter in groupA.

	all	alprazolam	midazolam	p
count	64	30	34	
age	3,3 +/- 2,1	3,6 +/- 2,4	3,0 +/- 1,9	0,1828
weight	15,2 +/- 5,6	15,9 +/- 6,3	14,6 +/- 5,0	0,4628
Admission/induction time	2:03 +/- 3:53	1:56 +/- 0:47	2:10 +/- 0:57	0,3191
ICC	1,77 +/- 1,5	1,61 +/- 1,37	1,91 +/- 1,61	0,5097

excitation %	34 +/- 48	17 +/- 38	50 +/- 51	0,0076
Intervention time	0:47 +/- 0:13	0:51 +/- 0:17	0:44 +/- 0:09	0,0754
EtCO2	38 +/- 3,8	38,5 +/- 4	37,6 +/- 3,8	0,4521
PEAD admission	7,11 +/- 6,76	6,13 +/- 6,4	7,97 +/- 7,09	0,26
Pain medication %	38 +/- 49	37 +/- 49	38 +/- 49	0,8978
PAED painfree	2,63 +/- 3,18	1,63 +/- 2,43	3,5 +/- 3,54	0,0163
PACU discharge time	1:10 +/- 0:32	1:02 +/- 0:26	1:17 +/- 0:36	0,0414

Conclusion

Alprazolam sirup is a good alternative to intrarectal midazolam as toddler premedication for abdominal wall surgery or superficial urology.

Its use resulted in less intense excitation at induction and with a more serene atmosphere in the PACU as well as a faster discharge.

Two factors can contribute to these observations : 1) the pharmacokinetics, i.e. onset 1 hour, duration up to 14 hours, make premedication less "timing dependent", and 2) the pure anxiolytic effect, without induction of desorientation or loss of memory.

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0066 Air-Free Intravenous Infusions

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Introduction

Air entrainment into intravenous lines is a frequent, time-consuming, distracting irritation for anaesthetic staff and potentially life-threatening for patients, especially in the context of congenital heart disease and veno-arterial shunting.

Methods

The School of Art accepts design briefs for final-year Product Design and Engineering graduates. An audit had identified potential small air emboli entering IV lines and needing removal in 42% of theatre cases, half of which derived from the drip chamber. Our brief was accepted, and we spent one year working with a final-year undergraduate to develop a drip chamber which prevents air ingress. The year roughly divides into research and development of concepts, testing and optimisation of the prototypes, then patenting, publicity and promotion of the completed final design.

Results



The project progressed through a series of concepts, evaluated in a multidisciplinary feedback session, then formal testing of prototypes, where plug and chamber geometry and materials were optimised in the laboratory. The end result was a working prototype capable of sealing the drip chamber as the meniscus falls, but which is simple to reactivate by squeezing the chamber walls. In laboratory testing, it was able to seal at drip chamber angles up to 40 degrees, taking into account non-vertical chambers where equipment encroaches on hanging space, and at flow rates from 5 to 999ml/hr. The final stage was patenting prior to public disclosure of the design.

Discussion

A year of collaboration outside medicine has used the skills of many groups to develop a device that may have the potential to reduce staff distraction and improve patient safety. The final stage of this project will be to demonstrate efficacy across the full range of clinical fluids in simulated use, and to find a manufacturer interested in taking the prototype forwards.

0067 Non invasive ventilation to manage children with neuromuscular disease following spinal surgery

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Introduction

A significant number of children with neuromuscular disease (NMD), in particular spinal muscular atrophy (SMA) are now being placed on nocturnal non invasive BiPAP ventilation to either prevent recurrent respiratory infections or treat daytime somnolence. Many of these children develop spinal deformity as part of their progressive muscular disease requiring corrective spinal surgery. Traditionally all children on nocturnal non invasive ventilation had intermittent positive pressure ventilation (IPPV) following spinal surgery and were admitted to the paediatric intensive care unit (PICU). From 2007 we adopted to routinely extubate these children where possible and place them on their own NIV postoperatively, aiming to reduce PICU admission and hospital stay. We have reviewed our practice to establish its success.

Method

We reviewed the notes of children on established nocturnal home non invasive ventilation who had undergone spinal surgery from January 2007 to December 2010. Details of the underlying condition, anaesthetic technique and peri-operative course were noted. In addition the number of children requiring postoperative IPPV and the frequency of respiratory complications were also recorded.

Results

The review showed that 13 children on established nocturnal non invasive ventilation underwent 35 spinal procedures. The age range was 3 to 13.5 years, 6 female: 7 male and 10 of the 13 children had an underlying diagnosis of SMA. All children received sevoflurane based balanced anaesthetics. Children undergoing rod lengthening procedures received short acting opioids in combination with paracetamol, ibuprofen and local wound infiltration. Six children underwent definitive posterior spinal fusion of which 2 required IPPV postoperatively. Eight children underwent insertion of growing rods of which only 1 required IPPV. Eight children had a total of 16 rod lengthening procedures (RLP) of which none required IPPV, and 11 of these procedures were managed as day-case. One child with a wound infection had 5 vac dressing changes managed postoperatively with NIV. Only one child extubated onto NIV required IPPV 4 days later with a chest infection.

Discussion

Non invasive ventilation to aid weaning from IPPV in children and its use to rescue acute respiratory failure following spinal surgery have both been described in the literature. However, we believe this to be the first large case series to describe the use of NIV in the immediate postoperative period following spinal surgery to manage children with NMD. In addition we have demonstrated that this technique is safe and reduces the need for PICU admission for more than 90% of our patients. Approximately 70% of our children having rod lengthening were managed as day-case. Avoiding IPPV and PICU admission benefits the child by reducing ventilator and hospital related morbidity. For the hospital it reduces costs and increasing bed availability.

Conclusion

Results of this audit supports our practice of immediate extubation and non invasive ventilation postoperatively in children with NMD established on nocturnal NIV. The technique is safe, reliable and cost effective.

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0068 Randomised cross-over comparison of size 2 ProSeal LMA, Classic LMA and I-Gel in a manikin

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Introduction

A number of paediatric supraglottic airway devices (SAD) have been recently introduced into clinical practice. There is little information on the usefulness of these devices in the paediatric patient population. The ProSeal Laryngeal Mask Airway is considered a gold standard SAD for paediatric use [1] We aimed to evaluate ease of use of the ProSealTM LMA, Classic LMATM and I-Gel in the AirSim Junior manikin (TruCorp Ltd, Dublin, Ireland).

Methods

Following approval by the Research and Development committee, we invited 50 anaesthetists to take part in this randomised cross-over study. Participants received instructions on the use of each SAD insertion according to the manufacturers' guidance.

The number of attempts, time to successful insertion (from handing over the device to lung inflation), SAD preference and participant's impression of the ease of insertion (Visual Analogue Scale: 0=resistance free, uninterrupted placement, 10=placement not possible) were recorded.

Leak pressure was recorded using previously evaluated method of measurement [2], with the gas flow set to 3 lmin⁻¹ and closed expiratory valve, the pressure at which there was an audible leak was recorded.

The position of the SAD was assessed with a fibroscope using a modified Brimacombe score [3]; (0=unable to pass scope through SAD; 1=vocal cords not seen; 2=vocal cords and anterior epiglottis visible; 3=vocal cords and posterior epiglottis visible; 4=only vocal cords visible).

The data were analysed using SPSS v 11. We used Friedman test for not-normally distributed continuous data and ordinal data. Chi-square test was used to analyse nominal categorical data.

Results

Twenty-two consultants and 28 trainees took part. The main findings of the study are presented in Table 1.

Table 1. Values are Mean (SD), number (%) as appropriate. VAS = Visual Analogue Scale

	ProSeal	Classic	I-gel	P value
Preference	0	25/50 (50%)	25/50 (50%)	<0.0001
Attempts at insertion	2.2 (1.5)	1.4 (0.8)	1.5 (0.9)	<0.0001

Time to insertion (s)	28 (20)	19 (12)	14 (9)	<0.0001
Leak pressure (cmH ₂ O)	13 (15)	28 (17)	36 (10)	<0.0001
Brimacombe score	0.7 (0.6)	2.4 (1.2)	3.2 (0.9)	<0.001
VAS (mm)	3.5 (2.4)	6.6 (2.0)	7.9 (1.6)	<0.0001

Discussion

This study found that I-Gel performance was superior to the cLMA and ProSeal LMA in terms of number of attempts, time to insertion, leak pressure, better position and ease of insertion. Poor performance of the LMA ProSeal may be due to poor synergy with the AirSim junior. Further studies are needed to establish the role of I-Gel and LMA ProSeal in the management of paediatric airway.

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0069 **Consenting for Magnetic Resonance Imaging under General Anaesthesia.**

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Introduction

Obtaining consent for children requiring general anaesthesia for MRI is complex and does not fit the usual mode for consent of invasive procedures as there are multiple specialties involved with no clear overall clinical lead. While there are no legal requirements in the UK to obtain written consent for an MRI scan to be performed under general anaesthesia, it is good practise to obtain written consent prior to the procedure.

Methods

A questionnaire survey study was performed in teaching hospital to determine among anaesthetists and radiologists who normally obtains formal consent in paediatric MRI scans under general anaesthesia.

Questions included:

Is it standard practise and who normally does it?

How often they are involved in these scans?

How competent do they feel performing the consent?

Confidence on explaining

Management benefits of the scan

Anaesthetic risks

Radiological risks and alternatives.

A free text section was available for any other comments.

Results

15 paediatric anaesthetists responded to the survey (10 consultants and 5 Registrars on a paediatric block). Permission to carry out the study among the Radiologists was denied by the Head of Service. 86.7% of the individuals surveyed deemed it to be standard practise to obtain informed consent prior to cases. 58.8% felt anaesthetists were usually performing the written consent. Among clinicians surveyed, 73.3% rarely performed general anaesthetic MRI scans while 13.3% performed it weekly and 13.3% performed it monthly. Among the consultants within this cohort, 70% of them almost always perform the consent. Among the registrars, 60% of them rarely perform the consent and 40% do not consent at all. Despite the disparity in the percentage of performing the consent for the scans, 60% of registrars felt competent in obtaining valid consent while 80% of consultants felt that they were not. Among consultants, confidence in explaining the potential benefits of the scan was 2.95/10 (SEM 0.579), the anaesthetic risks was 10.0/10 (SEM 0) and radiological risk/alternatives was 3.4/10 (SEM 0.67). Among the registrars, the corresponding scores were 5.0/10 (SEM 1.91), 9.25/10 (SEM 0.75), 5.5/10 (SEM 1.9).

Discussion

In our study, we have demonstrated that it was mainly the paediatric anaesthetists who are obtaining written consent, despite many consultants feeling not fully comfortable in obtaining valid consent for the process. Our results suggest that this may be due to the low level of confidence in explaining the management benefits of the proposed scans and the risk/alternatives to the proposed MRI. We propose that this situation may not be unique to our hospital and the involvement of multiple specialities in the process may contribute to the ambiguity of which medical professional should be obtaining valid consent. Anaesthetists are likely to have been left with the task of obtaining consent from a practical point as they assess the patient just prior to the proposed scan.

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0070 Parental reporting as a proxy for child's satisfaction with experience of the anaesthetic service in a national children's hospital - a tool for monitoring quality of service provision.

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Introduction

Quality is difficult to measure but is of high priority to both patients and staff. The NHS Constitution¹ highlights the expectation for monitoring and improvement of quality of service provisions. "Quality of care is personal to each individual patient" and patients have been given the right to high-quality, safe, effective and individual care¹. Thus public perception of quality and their satisfaction with the service received is paramount. Alongside formal measures by NHS bodies to monitor quality of service, individual departments can make use of the responsibility given by the NHS commission to patients to feedback about the treatments they receive.

It cannot be ignored that quality of care, which involves patient views, will also be financially rewarded^{2,3} but our primary focus should always be on excellence of care. Children's services have previously been shown to be fall behind adult services and must be addressed⁴.

Method

For one week each year, parents of every child receiving an anaesthetic in the hospital are invited to answer 14 questions regarding their satisfaction with the experience, as a proxy of their child's experience. Questions cover topics of environment, staff, information and atmosphere from pre-admission to induction of anaesthesia. The next stages are already audited by our pain team. Responses are presented in the style of a four-point Likert scale. Parents are invited to record comments next to each question. The audit was started in 2010 and results are disseminated to parents via the hospital website and posters and back to the Department of Anaesthesia through audit meetings.

Results

For 2011 we collated 57 responses during a week where 241 anaesthetics were carried out in the hospital. 100% of parents felt adequately prepared for what they needed to do on the day and to see their child have an anaesthetic. They were satisfied (score 3-4) with the way their child looked after induction. All were satisfied with their anaesthetist, how they were greeted, the information received, the opportunity to ask questions and the responses they received. 98% parents were in the anaesthetic room during induction and all were satisfied with the atmosphere there. 100% of parents were very satisfied with the support offered by the ward nurse and many offered exemplary comments and thanks on the form.

The lowest scores were for the ward waiting environment where 93% were satisfied.

In comparison to the first survey, there was an overall improvement, and there were no scores of 1 or 2 except in relation to the ward environment. Of note the satisfaction with the nursing staff on the ward increased from 81% very satisfied to 100% very satisfied.

Discussion

It is encouraging for staff involved in the anaesthetic service to receive positive feedback and in a time of change in the NHS it is good for building morale and team work. We should be striving for excellence in our work and as Berwick commented, "The ultimate measure by which to judge the quality of a medical effort is whether it helps patients (and their families) as they see it" (1997)⁵. Regular survey of patient opinion is a useful tool in evaluating quality of care and highlighting areas for improvement.

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0071 Childhood obesity and adverse perioperative respiratory events.

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Introduction: The incidence of obesity in Great Britain is rising. One-third of children in England are obese or overweight (1). In the adult population the adverse effects in the perioperative period of increased body mass index have been established (2). However in the paediatric population the effect of obesity is less certain and to date there are no studies based in the United Kingdom. This prospective audit aimed to determine the prevalence of obesity in our paediatric surgical population and to ascertain whether overweight and obese children are more likely to suffer adverse perioperative respiratory events.

Methods: After approval from the Local Ethics Committee an electronic audit form linked to a theatre information system was completed for children aged 1-16 years undergoing elective or emergency surgery at our institution. Information collected included demographics, ASA grade, type of surgery, airway device used, grade of laryngoscopy (where applicable), seniority of anaesthetist managing the airway and occurrence of an adverse respiratory event. Pre-defined events included: airway obstruction; desaturation; difficult mask ventilation; unplanned intubation; failed intubation; laryngospasm and bronchospasm. Recovery staff also recorded unplanned admissions to a high dependency area and whether the child required supplemental oxygen upon returning to the ward. Children were classified as obese, overweight, normal weight or underweight based upon age and gender appropriate percentiles for body mass index. Children above the 95th percentile were classified as obese and those above the 85th percentile as overweight.

Results: Information from 2227 anaesthetics was sufficiently complete for analysis. Of these, 218 children (9.8%) were obese, 161 overweight (7.2%). A total of 134 adverse respiratory events were documented in 96 cases. 108 of these events occurred in theatre and 26 occurred in recovery. An adverse event occurred in 11 out of 218 obese children (5.0%), 11 out of 161 overweight children (6.8%) and 74 out of 1848 children who were not obese or overweight (4.0%). The commonest adverse event was minor oxygen desaturation which accounted for 30 of the events that occurred in theatre and 11 of the events that occurred in recovery. The incidence of airway obstruction and arterial desaturation was higher in the children who were obese compared to those of normal weight. Statistical analysis is awaited as to whether these results are significant.

Discussion: The prevalence of obese and overweight children in our surgical population was lower than that occurring in the general population. Our study revealed a low incidence of adverse perioperative respiratory. The incidence of desaturation was higher amongst children that were overweight/obese which is consistent with previous studies (3, 4). Contrary to a previous study (4) this audit did not show an increase in difficult mask ventilation, bronchospasm or laryngospasm amongst children who are obese.

Conclusions: There is increasing evidence that obese children have more adverse respiratory events perioperatively (2-5). The results of this UK based audit suggest that children who are obese are more likely to have an adverse respiratory event perioperatively, particularly oxygen desaturation.

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0072 Massive haemorrhage in an adolescent with mechanic aortic prosthesis undergone scoliosis surgery.

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Pre-assessment data of the patient and indication for surgery

A 16 year-old female presented for posterior spinal fusion (T2 –L4) with instrumentation. During the pubertal growth, she experienced rapid progression of the scoliosis curvature and pain, and was advised to undergo surgery. Her medical history was significant for complex congenital heart disease: aortic coarctation that was corrected at 12 days, subaortic stenosis at 3 months, and aortic valvular stenosis that was corrected at 9 years with Carbomedic® n°19 aortic prosthesis. She developed an intracerebral bleeding event at 12 years without long-term effects. Physical evaluation showed a 90 bpm heart rate, SpO₂ 99% (room air) and blood pressure 110/70 mmHg. Pulmonary and liver function test were normal. Her NYHA class was I-II/IV. The preoperative transthoracic echocardiography showed good function of the left ventricle. Her medications were acenocoumarol, that was stopped 4 days prior of surgery. Then she received thromboprophylaxis with low molecular weight heparin.

Anaesthetic plan

She was premedicated with oral midazolam. General anesthesia was induced with midazolam, fentanyl, propofol, and cisatracurium. Anesthesia was maintained with remifentanyl and propofol infusion. Monitoring included an invasive arterial blood pressure, central venous pressure, urine output, somato-sensory and motor evoked potentials and temperature measurement. The patient was ventilated with oxygen/air mixture (FiO₂ 0'4) to maintain SpO₂ between 96-99%. Minute ventilation was adjusted to light hypocapnia.

During surgery the patient remained hemodynamically stable without vasoactive drugs and normothermic. No dysrhythmias were noted and she remained in normal sinus rhythm. We administered crystalloids (6500ml), colloids (500ml) and 4 units of packed red blood cells. Intraoperative diuresis was forced with furosemide 20mg, and diuresis was 2000ml. First intraoperative haemoglobin was 12g/dl, and the minimum 9'8 g/dl. Intraoperative coagulation studies showed prothrombin activity 62'6%, INR 1'30, cephalin time 50'3 sg. Total intraoperative blood loss was estimated in 3000ml.

She was extubated at 2 hours of her arrival to the ICU. The postoperative course was remarkably stable.

Description of incident/problem

Massive haemorrhage in scoliosis surgery in a patient with mechanic aortic prosthesis.

Solving the problem

The intraoperative haemorrhage was treated with infusion of large volumens of crystalloids, colloids, and red blood cells packed to maintain in good levels CVP and arterial pressure. We

didn't used tranexamic acid infusion by the the risk of prosthetic heart valve thrombosis.

Lessons learned and take home message

The excessive intraoperative bleeding was probably related to increase in intrabdominal pressure after prone positioning. Low CVP is very helpful in controlling bleeding during scoliosis surgery. We didn't consider to use delivered hypotension considering the limitations of aortic stenosis physiology, and in view of the uncertain effectiveness of arterial hypotension on blood loss in scoliosis surgery.

0073 Pharmacoeconomics with Sevoflurane and Low Fresh Gas Flow

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Pharmacoeconomics with Sevoflurane and Low Fresh Gas Flow

Introduction

Children undergoing general anaesthesia often require a gas induction, for which sevoflurane is the agent of choice. Sevoflurane is also often used to maintain anaesthesia. The aim of this study was to quantify the effect of fresh gas flow (FGF) on sevoflurane consumption during maintenance of anaesthesia and to highlight the cost implication of using sevoflurane with high FGFs. In addition, we aimed to raise awareness of the environmental impact of sevoflurane use with high FGF.

Method

50 patients undergoing general anaesthesia were audited over two months. Demographic data was collected from randomly selected cases. After the patient had been in the operating theatre for 10 minutes the FGF was recorded as well as circuit type and inspired and exhaled concentration of inhalational agent. The audit findings were presented to the anaesthetic department and all anaesthetists were appraised of the results by email. These included recommendations for lowering FGF where appropriate. The audit was repeated after 3 months.

Results

In the first study we found that sevoflurane was used for maintenance of anaesthesia in approximately 56% of cases. The mean and the median FGF used were 2.78 L/min, 2.5 L/min respectively. This incurred a cost of approximately £7.65 (€8.5) per hour at the median flow rate of 2.5 L/min. Results of the re-audit showed that Sevoflurane was still being used as a base agent of choice in 60% of cases for maintenance of anaesthesia, but the FGF used decreased significantly to a mean of 1.43 L/min and median flow rate of 1.2 L/min. Using Mann Whitney U test for unpaired, non-normal data distribution, the value of p for both data were < 0.0001.

Discussion

Sevoflurane is commonly used in our hospital for gas induction. Inhalational induction using a T-piece requires high FGF but the time taken for this is limited and often a small proportion of the total anaesthetic time.

Our initial audit demonstrated excess use of FGF and therefore higher consumption of Sevoflurane for maintenance of anaesthesia. Raising awareness of the impact of FGF on sevoflurane consumption and therefore cost, resulted in a clinically and statistically significant reduction of 52% in FGF. We estimate that this should result in a cost saving of more than £100,000 (€112,000) per annum on Sevoflurane expenditure. In other studies¹ the reduction in FGF was much larger than our study, this may be because ours is an exclusive paediatric centre and we use mostly uncuffed endotracheal tubes. Incidentally, we found that Desflurane was always used with low FGF, probably as a result of greater awareness of the cost related to this agent.

All halogenated anaesthetic agents contribute 0.02% of climate change².

Using low FGF for maintenance of anaesthesia will therefore reduce the environmental impact of these inhalational agents.

References

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0074 Anaesthetic management of an adolescent for scoliosis surgery with a bilateral Glenn circulation.

Ismael Acevedo¹, Clara Gallego¹, Fernando Domínguez¹, Jesús Burgos¹, Maria Soledad Asuero¹, ¹Ramon y Cajal Hospital, Madrid, Spain

Preoperative and description of the case:

Female patient aged 17 with a history of complex congenital heart disease (Dextrocardia, dextroapex, complete atrioventricular septal defect, double outlet right ventricle, transposition of major arteries, pulmonary stenosis and double inferior vena cava system), corrected by performing Double surgery for Glenn at 9 years, Klippel Feil syndrome, Von Willebrand disease, which is normally followed after age 6 with a diagnosis of congenital thoracic scoliosis. The patient, displayed progression of the disease from an initial Cobb angle of 15 ° to an angle of 93 °, covering the segment between T3 and T9 with apex located at T6, which presently, severely limits her activity by causing dyspnea as a result of very little physical effort.

Preoperative evaluation, hemodynamically stable, SatO₂ 77%, FE 66%, 34% Vital capacity, with parameters compatible with pulmonary restriction. Normal coagulation. Antiplatelet treatment with aspirin 100 mg / day, suspended prior to surgery.

Anesthetic Plan:

Was premedicated with bromazepam. HR 75 bpm, BP 110/60, O₂ Sat 77%. IOT using flexible fiberoptic tube through the nose flexometalico 7.5. Induction with fentanyl and propofol TIVA maintenance with propofol, remifentanyl remained hemodynamically stable O₂ Sat around 80%. Administered 500 mg of tranexamic acid. Central venous access is channeled through the right femoral artery and left radial without incident.

Intraoperative transesophageal echocardiography: single ventricle with common VAV with moderate impairment. Subaortic stenosis. Bilateral Glenn permeable. Good ventricular function. Correction of the deformity by posterior longitudinal osteotomy at the level of T3 wedge and by placing pedicle screws from T1 to L1 and C6 further nail, making it impossible to correct more than 50% of the original defect by altering potentials. Hemodynamically stable throughout the surgery, until the final correction, when the bleeding is heavy, desaturation to 69%. Total Contributions: 4000 ml of crystalloid, 1000 ml of colloids and 3 red cell concentrates. Final hemoglobin of 12.7. Total urine output 1300 ml. After 9 hours of surgery is transferred to the ICU. Extubation to 2.5 hours of admission. Hypotension with desaturation requiring additional administration of concentrated erythrocytes, responding appropriately. Anticoagulation with LMWH is raised smoothly. Transferred to the plant after 3 days, hemodynamically stable and afebrile.

Description of Incident:

After 48 hours has left cervical swelling. Echocardiogram shows evidence of left cervical venous thrombosis which progressed to the point of occlusion the left Glenn anastomosis without occluding the pulmonary artery.

Incident Resolution:

Moved back to the ICU and was treated with heparin, showed recanalization of the affected vessels 48 hours later. TEP is determined by helical CT.

Lessons

Learned:

In patients with Glenn physiology, who undergo other types of surgery to the heart, the priority should be to consider the possible coagulation of multifactorial etiology, which can trigger a prohemorrhagic or protrombotic state. For this reason it is necessary to clarify indications of antiplatelet or anticoagulation for such patients to minimize the risk of intraoperative bleeding and to avoid the severe consequences of a thrombosis.

0076 Open fetal surgery for myelomeningocele repair. Three case reports.

Susana Manrique¹, Sonia Francés¹, Eva Andreu¹, Jose Luis Peiró¹, Marc Pellicer¹, Nuria Montferrer¹, ¹Vall d'Hebron University Hospital, Barcelona, Spain

Introduction

Fetal surgery is an area of rapid and exciting growth. Advances in prenatal diagnosis and surgical techniques have resulted in an increasing number of fetal interventions, so a deep study of maternal and fetal pathophysiology is basic for an efficient anesthetic management (1). Surgical techniques range from minimal invasive procedures as fetoscopic surgery to open fetal surgery required for myelomeningocele repair. There is experimental and clinical evidence that timely prenatal microsurgical closure of myelomeningocele (MMC) improves outcome, because it prevents exposure to the amniotic fluid and arrests cerebrospinal fluid leakage, which reverses hydrocephalus and cerebellar herniation (2) We present three case reports of open fetal surgery for myelomeningocele repair.

Cases

Two pregnant women at 22 weeks' gestation and one at 24 weeks' gestation underwent open fetal surgery for myelomeningocele repair. They were given oral diazepam 5 mg and rectal indomethacin 50 mg the night and also two hours before surgery. After fetal ultrasonography evaluation, maternal epidural analgesia was performed for postoperative analgesia and tocolysis. Monitoring included electrocardiography, pulse oximetry, tidal volume, respiratory rate, capnography, central venous pressure, invasive arterial pressure, entropy and oesophageal temperature. Rapid sequence induction using fentanyl 150 µg, propofol 120-150 mg and rocuronium 50 mg was performed followed by tracheal intubation. General anesthesia was maintained with increasing concentrations of sevoflurane up to 2 MAC when hysterotomy was performed to reach a profound uterine relaxation. If it was needed a more intensive uterine relaxation, nitroglycerin boluses of 50-100 µg iv were used for short-lasting uterine relaxation. Sometimes vasopressor support was required with ephedrine or phenylephrine for adequate uteroplacental perfusion.

Fetal anesthesia was provided by a combination of placental passage and fetal intramuscular administration of fentanyl 10-20 µg /kg, atropine 20 µg/kg and vecuronium 0,2 mg/kg after fetal part was exteriorized through the hysterotomy. Maternal abdominal wall was opened by means of a large Pfannenstiel incision, using the scar line in case of previous c-section. Bloodless approach was essential. Non-latex gloves were used for all procedure. Sterile intraoperative ultrasound was used to map the location of the placenta and manually manipulate the fetus, if necessary, into optimal position before sonographic guided hysterotomy. About 30% of amniotic fluid was collected by aspiration in sterile syringes and saved in warm saline serum. A catheter was inserted into the uterine cavity to allow intermittent infusion of warmed Ringer's lactate solution, thereby maintaining intrauterine volume and temperature. The spinal defect was exposed and fetal back was fixed to the uterine wall by means hand holding of one of the assistant surgeons in order to avoid loss of amniotic fluid. The fetal heart rate and placenta were monitored during all surgery by ultrasound. Fetal myelomeningocele repairing was performed using microsurgical instruments. The surgeon repaired the neural

tube defect and uterine cavity was filled with the preserved amniotic fluid and Ringer's lactate solution with cefazoline.

After closure of hysterotomy, a 4 g iv loading dose of magnesium sulphate was given, followed by an infusion at 1 g/h. During closure of hysterotomy, atosiban was also administered (6 mg/h) for postoperative tocolysis and the epidural catheter was incrementally dosed with bupivacaine 0.25%. Care was taken with intraoperative fluid therapy with cristalloids and colloids, maintaining a 10 mmHg PVC. Magnesium sulphate and atosiban were discontinued at 4th and 7 th day respectively. Daily fetal echocardiography and ultrasound were performed. Two of the patients underwent vaginal delivery at 31 weeks' gestation without any complications. The infants weighed 2100 g and 2500 g respectively. The other patient had a uterine rupture and a caesarean section was performed at 30 weeks' gestation. The infant had Apgar scores of 5 and 8 at one and five minutes respectively and weighed 2300 g. All the babies had a good evolution, they could move legs and walk, two needed ventriculoperitoneal shunt and all reverted cerebellar herniation.

Conclusion

Although there is a trend towards less invasive fetoscopic techniques, open fetal surgery is a good surgical strategy for special congenital defects as myelomeningocele. The three case reports had a good evolution, so we consider that an early repair of this congenital defect can improve the outcome of these cases.

References

- 1.- Galinkin JG, Schwarz U, Motoyama EK. Anesthesia for Fetal Surgery. In: Motoyama EK, Davis PJ, ed. Anesthesia for Infants and Children. 7th ed. Philadelphia: Mosby Inc, 2006: 707-710.
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0078 Location Location Location

Sarika Rathi¹, Colin Dryden¹, ¹*Alder Hey Hospital, Liverpool, UK*

Introduction

Fetal surgery is an area of rapid and exciting growth. Advances in prenatal diagnosis and surgical techniques have resulted in an increasing number of fetal interventions, so a deep study of maternal and fetal pathophysiology is basic for an efficient anesthetic management (1). Surgical techniques range from minimal invasive procedures as fetoscopic surgery to open fetal surgery required for myelomeningocele repair. There is experimental and clinical evidence that timely prenatal microsurgical closure of myelomeningocele (MMC) improve outcome, because it prevents exposure to the amniotic fluid and arrests cerebrospinal fluid leakage, which reverses hydrocephalus and cerebellar herniation (2) We present three case reports of open fetal surgery for myelomeningocele repair.

Case reports

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0079 Sublingual and Intranasal dexmedetomidine as a premedication in children: A preliminary study

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INTRODUCTION

Dexmedetomidine is used for premedication in children to reduce separation anxiety and achieve steal induction. The objective of this study was to evaluate the effects of intranasal and sublingual dexmedetomidine as a premedication in children.

METHODS

Sixty seven children, aged 2-6 years, scheduled for elective minor surgery were randomly allocated in two groups to receive dexmedetomidine either by sublingual route 2 µg kg (group S) or by intranasal route 2 µg kg (group N) 1 hour before the operation. Heart rate (HR), respiratory rate (RR) and peripheral oxygen saturation (SpO₂) were measured 10 min. intervals during preoperative period. Drug acceptance, preoperative sedation and anxiety, parental separation, mask acceptance and postoperative agitation were evaluated.

RESULTS

There were no significant difference between the two groups in heart rate, respiratory rate and SpO₂ after administration of either medication. After sixty minutes of premedication anxiolysis, mask acceptance, parental separation and postoperative agitation were comparable in two groups. The sedation level of Group N was significantly higher than that of Group S 60 min after drug administration (2.96 ± 0.17 and 2.55 ± 0.56, respectively p=0.006). However the number of children with adequate level of sedation were similar in both groups (group S:32 and group N:34) 1 h after premedication.

CONCLUSION

Clinical effects of dexmedetomidine were similar with intranasal and sublingual route. Level of sedation by sublingual route was less than that by intranasal route because of a significant proportion of medication was swallowed by the children. It can be preferred by intranasal route or higher doses by sublingual route for premedication in children.

0083 Audit and evaluation of preoperative sedative medication in children

Lynn Fenner¹, Richard Beringer¹, ¹Bristol Royal Hospital for Children, University Hospitals Bristol NHS Foundation Trust, Bristol, UK

Introduction

Induction of anaesthesia can be extremely stressful for children and parents. Sedative premedication can reduce this distress [1]. The clinical effect is dependent upon the choice of drug, dose and timing of administration. Our institution occasionally experiences difficulty in administering the preferred drug at the correct time. This audit was performed to highlight these issues, in order to write a guideline to improve future care.

Methods

Between January and April 2011, Anaesthetists and Recovery Staff prospectively completed questionnaires for 50 children; noting age, weight and administration problems. Times for drug administration, arrival in the Anaesthetic Room (AR) and Recovery stay were documented. Sedation and confusion were measured with validated scales [1]. The modified Vancouver sedation scale was used in AR and Recovery: (1 - tearful, combative; 2 - alert, awake; 3 - drowsy, sleeping). A 4-point confusion scale was measured in AR: (1 - calm; 2 - easily calmed; 3 - could not be easily calmed; 4 - combative, excited, disorientated). Emergence agitation was assessed with the PAED Score [2]. Pain was scored between 0 and 10. Post-operative nausea, vomiting and shivering were recorded.

Data is reported as median (IQR).

Results

	Midazolam	Clonidine	Clonidine Midazolam	Clonidine Ketamine
Number	14	33	2	1
Age (years)	8(6-10)	6(5-10)	2 & 12	6
Weight (kg)	34(25-39)	20(18-36)	18 & 74	24
Dose per kg	0.5(0.4-0.5) mg.kg ⁻¹	5(4-5) µg.kg ⁻¹	5µg.kg ⁻¹ 0.5mg.kg ⁻¹ & 3µg.kg ⁻¹ 0.3mg.kg ⁻¹	4µg.kg ⁻¹ 2mg.kg ⁻¹

Clonidine was prescribed most frequently. Drugs were administered 1 (0 - 10) minutes after the request. Three children objected to taking midazolam. All children swallowed clonidine. One ward took 45 minutes to locate ketamine. In AR, the sedation scale was 3 (2 - 3) for midazolam and 3 (1 - 3) for clonidine. The confusion scale was 1 (1 - 2) for midazolam and 2 (1 - 2) for clonidine. Children entered AR 32 (30 - 43) minutes after receiving midazolam,

compared to 68 (47 - 79) minutes after clonidine.

Children had good pain control in Recovery, scoring 1 (0 - 2) for midazolam and 0 (0 - 1) for clonidine. The sedation scale was 3 (3 - 3) for midazolam and 3 (3 - 3) for clonidine. The PAED score for midazolam was 11 (8 - 12) and for clonidine 7 (6 - 10). Nausea and shivering were observed on one occasion. Both children had received midazolam.

There was no difference in Recovery stay between midazolam and clonidine (30 (30 - 47) and 29 (20 - 41) minutes respectively).

Discussion

Midazolam and clonidine had comparable effects in AR. Clonidine was given earlier than midazolam; reflecting widespread belief in a slower clinical effect, despite evidence to the contrary [3]. In Recovery, clonidine was superior to midazolam: reduced emergence delirium and pain scores, and less nausea and shivering. It was also more palatable. This replicates previous studies and explains the increasing use of clonidine in our institution [1].

A guideline is under development with dosages and formulations of sedatives that the Anaesthetists wish to be stocked by wards.

References

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0086 Age-specific web-based information to prepare children and parents for anaesthesia and surgery

Gunilla Lööf¹, ¹*Department of Anaesthesia and Intensive Care, Stockholm, Sweden*

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 2007, 5857 children underwent examinations, treatments or surgical procedures associated with anaesthesia of which 3562 (61%) were elective. During the audit period September – December 2007, 2076 children underwent anaesthesia of which 1350 (65%) were elective. The information system is available to both elective and acute patients but this initial follow-up has focused on patients admitted for elective surgery. All families whose children were planned for elective procedures associated with anaesthesia were 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. Age-specific web-based information to prepare children and parents for anaesthesia and surgery

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 (figure). What information would you like to receive in the future as a complement to the regular pre-anaesthetic visits to the anaesthesiologist?

Team: Gunilla Lööf, RNA / Erika Berggren, RNA / Ulf Lindsten, MD / Per-Arne Lönnqvist, MD, PhD Address: Department of Anaesthesia and Intensive Care Astrid Lindgren Children's Hospital Karolinska University Hospital Stockholm, Sweden

Contacts: narkoswebben@karolinska.se Limitations / Future development:

Despite that parents and children were encouraged to visit the website 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 preanaesthetic information.

0087 ANESTHETIC MANAGEMENT OF PEDIATRIC PATIENTS IN MRI UNIT. HALLERMAN STREIFF DISEASE AS AN EXAMPLE OF OUR PATTERN OF ACTION.

JULIO CESAR GALAN GUTIERREZ¹, AURORA MENENDEZ¹, RODRIGO AVELLO¹, ¹HOSPITAL CENTRAL DE ASTURIAS, OVIEDO, Spain

Abbreviated

INTRODUCTION

Magnetic resonance imaging as a diagnostic procedure applies non-invasive imaging of soft tissue structures of the body like the brain, greater sensitivity to identify and characterize the anomalies and central lesions than other methods of diagnosis images consolidating as an invaluable tool for early diagnosis and evaluation of many focal lesions and tumors. Different protocols have been described anesthetic: Chloral hydrate oral antihistamines alone or in combination, intravenous sodium pentobarbital, ketamine, intravenous or intramuscular, with or without propofol and midazolam, propofol intravenous, inhalation anesthesia, general anesthesia with endotracheal intubation or laryngeal mask .

MATERIAL AND METHODS

We performed a prospective study of a group of 99 children aged between 4 months and 12 years of age (mean age: 4.2 years). The physical condition of most children, as classified by the American Society of Anesthesiologists (ASA) were ASA I (healthy patient) or II (patient with mild systemic disease without functional limitation). Only 3 of them were ASA III (severe systemic disease with functional limitation).

The technique starts with 100% oxygen and sevoflurane from 4 to 6 vol.% Through a Mapleson C circuit anesthetic type, until the patient can be placed in the required position, when it is lowered the concentration of sevoflurane 1-2% and peripheral venous channels when contrast will be used for testing or if necessary for another reason.

It fits well the face mask with paper tape, ensuring that no significant leakage and the patient perfectly vented through a Mapleson system attached to a corrugated tube to facilitate placement of the head (figures 1 and 2) and was left inside the cabin NMR sevoflurane concentration of 0.75% and 100% oxygen at a flow rate of at least 3 times the minute volume of the patient to avoid rebreathing of CO₂.

RESULTS

There were no cases in which it was necessary to manually ventilate the patient to remove the residual sevoflurane. All the children moved spontaneously after removal of the facemask. During maintenance of anesthesia there wasn't any case of apnea, and all patients maintained a spontaneous breathing with adequate saturation. Only 3% of patients (3 cases) had an episode of saturation below 97% (96 and 95%) at 10 minutes after the start of anesthesia, and 20 minutes after only 2% had pulse oximetry of 96. As for complications during the scan, 4% of cases were detected during the scan movement, being necessary to go for a few seconds in the exam room to deepen anesthesia Sevoflurane up the concentration in 1%. Only in one case (1%) patient was awakening from intra-study (a patient with occupation of the sinuses). Only 5 children had vomiting (5.1%), all within 20 minutes after the cessation

of anesthesia, and of these, 60% of cases (fasting incomplete) Once the anesthesia is performed, patients were assessed using Stewart's test at 5, 10 and 15 minutes to confirm the rapid awakening and appropriate patient, obtaining values at 5 minutes, 4 points in 4% patients, 5 points in 11% of them and 6 points in the remaining 85%. After 10 and 15 minutes for 87% of patients had a score of 6, ie, fully awake.

CONCLUSION

The sedation protocol using sevoflurane as sole anesthetic agent for MRI scanning in children is effective, because all examinations were performed successfully, safe and reliable because no major complications, and efficient, because the technique has low cost relation to alternatives and generates no hospital admissions or visits to units of post-anesthetic recovery.

0088 Preoperative management of the Wolcott- Rallison Syndrome. A case report.

ANDREA ROMERA¹, MÓNICA HERVIAS¹, JESÚS CEBRIÁN¹, JOSE RAMÓN FUENTES¹, MANUEL PELÁEZ¹, ¹HOSPITAL UNIVERSITARIO GREGORIO MARAÑÓN, MADRID, Spain

AIMS:

We present the anesthetic and peri-operative management of a case of Wolcott- Rallison Syndrome (WRS) focusing on the need of a multidisciplinary approach to improve patient preparation for surgery and anesthesia.

MATERIAL AND METHODS:

12-year-old girl undergoing distal femoral varus osteotomy and total hip replacement. The patient medical history includes atlas hypoplasia, magnum foramen stenosis, type 4 renal tubular acidosis and insulin-requiring diabetes. She had previously suffered of acetaminophen-induced acute liver failure and also developed an acute kidney failure that required hemodialysis after appendectomy. Pre-anesthetic assessment plan includes admission 24 hours before surgery in order to achieve optimal metabolic control. This is possible due to collaboration from different Services: Anesthesia, Endocrinology, Orthopedic and Nephrology Services.

RESULTS:

Wolcott-Rallison Syndrome is a rare autosomal recessive disease; characterized by neonatal/early-onset non-autoimmune insulin-dependent diabetes associated with skeletal dysplasia, frequent episodes of acute liver failure, renal dysfunction, intellectual deficit, hypothyroidism, neutropenia, recurrent infections and growth retardation. Prognosis is poor and patients mostly die at a young age. In a literature review less than 40 cases have been reported up to 2010. Close therapeutic monitoring of blood glucose levels and addition of an insulin infusion pump are recommended due to the high risk of acute episodes of hypoglycemia and keto-acidosis. The patient was admitted 24 hours prior to scheduled surgery to achieve optimal perioperative glycemic targets (glycemic levels between 5 and 11 mmol/L (90 – 200 mg/dL) and continuous correction of acidosis by intravenous administration of calcium carbonate.

Combined epidural and a total intravenous anesthesia technique were chosen to avoid the potential toxicity of inhalation agents. In-line head and neck position was chosen for tracheal intubation rather than the sniffing position. A central venous catheter was placed in the internal jugular vein. Glycemic was monitored hourly before surgery and every 30 minutes during the operation. Frequent blood samples were taken. Surgery lasted nearly ten hours. 150 ml of red blood cells were administered for transfusion. She was admitted in the Intensive Care Unit for a 24- hour period. Postoperative pain was successfully controlled with epidural 0,125% bupivacaine continuous infusion. No serious incidents were reported during the preoperative period.

CONCLUSION:

Since WRS involves major risk due to its association with acute kidney and liver failure and

prompt death, an interdisciplinary team approach is the cornerstone for a safe management during all the perioperative period. Regarding to anesthesia pharmacology, non-steroidal anti-inflammatory drugs, inhalation agents, colloids, acetaminophen and other drugs metabolized by the liver should be completely avoided. Preoperative management is based on an integrated process of care beginning from the first anesthesiologist assessment till the post-operative period in the ICU.

0089 CAUDAL EPIDURAL BLOCK IN AWAKE EX-PREMATURE INFANTS FOR HERNIOTOMY AND CONTRALATERAL LAPAROSCOPIC INGUINAL EXPLORATION

Plinio Enrique Sierra Ruiz¹, Trini Trull Ventura¹, Sonia Frances¹, Remei Parera¹, Nuria Montferrer Struch¹, ¹*Hospital Universitario Valle de Hebron, Barcelona, Spain*

INTRODUCTION

Exprematore infants before 60 weeks of post-conceptional age are at high risk of respiratory morbidity. General anesthesia has big potential problems in the face of difficult airway, highly reactive airway, In the firsts weeks of life, drug metabolism is less efficient than in later life. The liver and kidney are immature with less effective hepatic and kidneys metabolism. The pharmacokinetic and pharmanodynamics of most medications in neonates differ from those in child and adults. Almost, general anesthesia increases risk of apnoea. Inguinal hernias are common in preterm infants. In extremely low birth weight infants, an inguinal hernia occurs in approximately one third of patients .We evaluated the tolerance, efficiency and outcome of caudal block performed in 6 consecutive awake ex-prematore infant for inguinal herniotomy, following contralateral laparoscopy inguinal exploration.

METHODS

Written informed consent was obtained form each infant's parent(s). Infants were considered for inclusion if their estimated gestacional age at birth was less than or equal to 36 weeks and post-conceptual age at the surgery time less or equal 60 weeks. We aimed to investigate the cardiovascular, respiratory and metabolic performance in high risk infant with the regional anaesthesia management and the occurrence of morbidity. Monitoring includes NIBP, ECG. SaO2 and rectal temperature. Caudal epidural block technique be used as a single shot was given under aseptic precautions with Quincke Needle 23 G with bupivacain 0, 25 % with epinephrine 1:200000, 4 mg. kg-1 plus normal salin end point volumen 2 ml. kg-1. Target dermatome T4. Latency time 20 min.

RESULTS

Six infants with a mean age 35 post-conceptional weeks and 5 weeks of age were studied. Caudal anesthesia was successful in 100% of patients. Bupivacaine dosis 4 mg. k- 1 is not associated with early central nervous and cardiovascular system toxicity in our awake infants. The average time to perform the caudal block was less than 1 min. Performance of caudal block was well tolerated by the infants. All infants crying and breath holding during block placement with out complication. In all cases, 10 minutes after caudal block the patient are quiet, awake and slightly decreased mobility of the lower extremities. Change in vital signs following caudal block, was no significant (heart rate, systolic blood pressure or arterial oxygen saturation). Mean time to onset surgery was 35 minuts. Open herniotomy was performed without problem. Diagnostic laparoscopy (DL) of the contralateral side during inguinal herniotomy via the hernia sack may avoid a subsequent second operation. In our serie 0% diagnostic and neumoperitoneum was well tolerated in awake infant.

DISCUSSION

Caudal anesthesia in awake high risk infants is safe for performing herniotomy. The contralateral laparoscopic inguinal exploration is possible with this anesthesia approach. The learning curve of this technique is slow and residents and specialists should start her/his training with patients under general anesthesia.

0091 **Unexpected Coronary Steal in a 5 month old child undergoing Microlaryngobroncho-scopy**
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Pre-assessment data and indication for surgery

Microlaryngobronchoscopy (MLB) was requested for a 5month old male infant weighing 6.7kg, born at 29 weeks gestation. The neonatal course had included ventilation of over a week due to respiratory distress syndrome. Since then he had been admitted on multiple occasions with recurrent stridor. Echocardiography had revealed left pulmonary artery branch stenosis, mild mitral regurgitation with good coronary artery flow and ventricular function. Concern regarding slowed growth and breathlessness were thought to be due to upper airway obstruction.

Anaesthetic Plan

Inhalational induction with sevoflurane in oxygen was undertaken, a patent airway was maintained with a size 3 uncuffed tracheal tube placed in the nasopharynx. The aim was to maintain spontaneous ventilation throughout the procedure and provide topical anaesthesia of the larynx and upper trachea with 1% lignocaine. Standard monitoring was established in the form of 3 lead ECG, oxygen saturation, capnography and non-invasive blood pressure recording.

Description of incident / problem

Shortly after induction bradycardia occurred requiring glycopyrrolate. As the heart rate rose, significant ST depression was noted in all 3 leads with concurrent hypotension. Three 5ml/kg colloid boluses were given with some improvement in blood pressure but no resolution of ST changes. 12 lead ECG showed severe antero-lateral ischaemia. An echocardiogram in theatre revealed reduced left ventricular function and a small left coronary artery with severely reduced flow. Sevoflurane was replaced with isoflurane with no improvement. Subsequent hypotension was treated with increments of phenylephrine to good effect. The airway was secured with a 2.5 endotracheal tube and ventilation and oxygenation were uncomplicated throughout.

Solving the problem

The patient was transferred for coronary angiography within the same hospital. Notably the ST changes improved greatly upon cessation of volatile anaesthesia during transfer with intravenous midazolam and morphine, ST deterioration recurred with sevoflurane in the cardiac catheterisation suite. Volatile anaesthesia was then replaced with intravenous fentanyl and midazolam resulting in almost complete resolution of ST changes on arrival to the intensive care unit post-operatively. Coronary catheterisation revealed complete occlusion of the left main stem with cross filling via collaterals from the right coronary artery territory. Despite a significant troponin and creatinine kinase rise ventricular function was preserved post-operatively. Propranolol and nifedipine were commenced. Over the following month laryngotracheal reconstruction and opening of the left coronary ostium were performed successfully.

Lessons learned and take home message

Coronary steal is commonly seen in association with occluded coronary vessels where distal

tissue relies on collateral blood flow supplied by partially stenosed vessels. Because of the maximal vasodilation within the vessels distal to the occlusion, should the vessel feeding the collaterals preferentially dilate the blood will be 'stolen' from the collateral circulation rendering the post-occlusion tissue ischaemic. Volatile anaesthetics have been strongly implicated in 'steal' due to their vasodilatory and negatively inotropic effects. In spite of a reassuring echocardiogram and a clinical assessment supporting airway narrowing as a cause of breathlessness and poor feeding, this patient in retrospect had precarious 'steal prone' coronary anatomy resulting in significant morbidity.

0093 The effects of intraoperative single dosage tramadol or dexmedetomidine on postoperative analgesia, sedation and emerge reactions in pediatric patients undergoing adenotonsillectomy

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Aim: Providing adequate postoperative analgesia to children undergoing adenotonsillectomy is often a challenge. Opioids or nonsteroidal antiinflammatory agents provide effective analgesia, but they may interfere with adverse effects such as nausea and vomiting, respiratory depression or bleeding. This prospective, double-blind, randomized study was designed to compare the effects of intraoperative tramadol and dexmedetomidine on postoperative recovery including pain, sedation, emerge reactions, and hemodynamics in pediatric patients undergoing tonsillectomy and adenoidectomy.

Method: After Institutional Ethics Committee approval and parents' written consent. Eighty patients, aged 2-12, undergoing adenotonsillectomy was included in this study. Anesthesia induction and maintenance were provided with sevoflurane in O₂/N₂O mixture. Intubation was facilitated with rocuronium. Patients received a single intravenous dose of 2 mg/kg tramadol or 1 µg/kg dexmedetomidine. Intravenous morphine 25 µg/kg administered for rescue analgesia. Duration of surgery and anesthesia, hemodynamic data, time to tracheal extubation, emerge reactions, pain scores, time to first postoperative rescue analgesic, amount of total rescue analgesic received, need for antiemetics, intraoperative and recovery complications, and discharge time were assessed. Statistical analyses were made with Mann–Whitney U-test for agitation and pain scores. Numeric data were analyzed using unpaired Student's t-test. Statistical significance was accepted for P < 0.05.

Results: There were no significant differences between the 2 groups in patient demographics, emerge reactions, antiemetic need, and discharge time. Mean arterial pressure and heart rate were values were significantly lower in dexmedetomidine group. There were no significant difference in emerge reactions. The pain score, the first analgesic requirement time, total analgesic consumption, and sedation scores were significantly lower in tramadol group.

Conclusion: When compared with dexmedetomidine, the use of tramadol in children is associated with lower side effects, opioid requirement, and comparable emerge agitation reactions.

0094 Effectiveness of a near-infrared vascular imaging system to support venipuncture in children

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Introduction. Venipuncture for blood withdrawal is a widespread medical procedure, which can be difficult in children. Multiple punctures cause pain and distress.¹ Subcutaneous fat and a dark skin color are known features to make localization of the veins difficult. Visualization of veins with near-infrared light might support venipuncture.² In the present study, we investigated the clinical effectiveness of a near-infrared vascular imaging system (the VascuLuminator) in venipuncture in children, attending the phlebotomy stations of two tertiary pediatric referral hospitals for a blood withdrawal.

Methods. All consecutive children of 0 – 18 years old attending the Clinical Laboratory of a pediatric university hospital were included in the present two-center study. Allocation of the VascuLuminator was randomized over the weeks and phlebotomists were allowed to use the device on their own decision when it was available. The primary outcome was *success at first attempt*. A total of 1165 patients were included in the Wilhelmina Children's Hospital, University Medical Center Utrecht (UMCU) and 784 in Emma Children's Hospital, Academic Medical Center, Amsterdam (AMC) over a period of 16 weeks. Age, skin color, location of the first puncture and FLACC pain scores were recorded.

Results. Case-mix in both hospitals was comparable; mean age was respectively 9 (± 5) and 10 (± 5) years and about 20% of patients in both hospitals had a dark skin color (Fitzpatrick skin type V and VI). FLACC pain scores were 0 (0 – 4) and 0 (0 – 5) respectively. The VascuLuminator was used in only 21 patients in the UMCU and 3 patients in the AMC. *Success at first attempt*; 87.6% without and 89.2% with the VascuLuminator in the UMCU ($P = .45$) and respectively 93.6% and 92.1% in the AMC ($P = .47$) were not significantly different. In both hospitals, age was a significant predictor ($P < .01$) for *success at first attempt*, with an OR of 0.90 (0.86 – 0.93) and .89 (0.84 – 0.94) respectively. When more than one puncture was necessary, FLACC scores increased to 3 (0 – 6) and 6 (0 – 8) respectively. For patients with a dark skin color, *success at first attempt* was 91.9% in both hospitals, while for patients < 3 years of age, *success at first attempt* was 70.3% in the UMCU and 77.8% in the AMC.

Discussion. There was no significant difference in success at first attempt between the VascuLuminator and the control group when the VL was used on a voluntary basis, which was not surprising since the VascuLuminator was not often used. A previous study by our group, in which use of the VascuLuminator was obligatory, showed a substantial beneficial effect when the VascuLuminator was used during venipuncture in patients up to 6 years of age.² The high initial success at first attempt (the lack of clinical problem), aversion for technology or (lack of) user-friendliness of the device might be the reasons for the lack of use of the VascuLuminator. On the other hand, the device was used in a very small population 24 patients, which might indicate that there is a very small group in which the VascuLuminator was perceived to be helpful.

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0096 A survey of SPANZA members - experience of PICC insertion - indications, management, follow-up and complications.

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Purpose: Peripherally Inserted Central Catheter (PICC) line insertion is a significant burden to emergency theatre resources(1,4) We conducted a survey to determine the current practice of paediatric anaesthetists inserting PICC lines in children in New Zealand and Australia.

Method: An online survey to the committee of the Society for Paediatric Anaesthesia in New Zealand and Australia (SPANZA) was sent for approval, who in turn distributed this confidential online survey to all SPANZA members.

Results: The response rate was 20% (45/227), with responses from 11 Institutions within Australia and New Zealand. 50% of all PICC lines are inserted by anaesthetists under general anaesthesia. 8 of the 11 institutions insert between 100-200 PICC lines per year. Most line insertions were performed on an acute operating list (90% of respondents). When PICC line insertion does not require a general anaesthetic, radiology, nursing staff and PICU staff were more likely to insert the lines. Upper limb line insertion is the most popular site - 67% with preferential use of the upper limb and an additional 16% stating that they only use upper limb vessels. Ultrasound guided insertion was very common with 91% of respondents noting that it is used always or frequently. Common postoperative complications included line occlusion, leakage and inadvertent removal. Follow up of line complications was generally poor with 56% of respondents noting that their hospital had no subsequent review of PICC lines.

Conclusions: The response rate was low although we did receive at least one answer from each major institution in Australasia. Ultrasound use is common in children; similar to adult experience (2). The use of general anaesthesia for PICC line insertion has a significant impact on acute theatre resources. In North America, the majority of PICC lines are not inserted by anaesthetists under a general anaesthetic (3). Here many lines are inserted with local anaesthetic or under sedation, often by a PICC nurse led team. We may benefit from changing our system to involve less use of general anaesthesia thus decreasing the burden on limited acute theatre resources.

The lack of a regular organised postoperative review of PICC lines in most hospitals is a cause for concern and needs to be addressed (5). We have recommended that our department develop a follow-up service to provide improved care.

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0097 Cochlear Implants- A case for day-case?

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Introduction

Over the last two decades the use of cochlear implants has revolutionised the management of patients with severe hearing impairment. The surgery lasts between 2 and 6 hours and routinely involves an inpatient stay of one or more days. The NHS Plan aims that 75% of all surgery is carried out as day-case and the Department of Health (DoH) advise we treat day-case as the norm for elective surgery. With this in mind we aimed to assess if cochlear implants could be carried out on a day-case basis in our institution.

Methods

We reviewed the notes of all patients who underwent cochlear implantation in 2010. Data collection included patient age and co-morbidities, distance of home address to hospital, peri-operative analgesia and anti-emetics, incidence of post-operative nausea and vomiting and post-operative intravenous fluid and analgesic requirements. This was used to determine if the patient met the criteria for a day-case procedure. A patient was deemed to be medically fit for day-case discharge if they required oral analgesia only and vomited only once within 4 hours of surgery. We also considered if they would be eligible for day-case discharge with regards to distance from hospital, using a 30 minute criterion. The time taken to pass urine and tolerate diet was also recorded but documentation was extremely poor therefore we felt unable to include this in our assessment for day-case discharge.

Results

In 2010 64 patients underwent cochlear surgery of which 62 sets of notes were found; 28 unilateral and 34 bilateral. Age range was 1 to 12.5 years (mean 4.5 years) and weight range was 8 to 46.7kg (mean 18.5kg). 10 had pre-existing conditions which would exclude them from a day-case procedure. Of the remaining 52 patients 37 (71%) would have met the medical criteria for day-case discharge. Of the 15 patients who did not meet medical criteria the most common reason was vomiting (10/15). Of these one patient had no anti-emetics in theatre and 4/10 received ondansetron only. 3/15 patients required oramorph post-operatively despite all having intravenous morphine peri-operatively. One patient required 48 hours of IV antibiotics and one patient had post-operative stridor. 10/37 patients considered medically fit for day-case discharge lived within 30 minutes of the hospital. However all except 1 of the patients lived within 30 minutes of local hospital accident emergency department accepting paediatric patients.

Discussion

The advantages of a day-case procedure are well known; allowing patients to recover in their own home, less time off work for carers, reduced risk of hospital acquired infection and of course reduced costs. Only 10/62 patients in this audit met all the criteria for day-case discharge. If these were able to recover at home this could save the hospital £2,500 (if bed costs £250/night). However this could be improved by ensuring all patients receive

prophylactic ondansetron and dexamethasone in theatre and liaising with local hospitals to allow discharge home with an appropriate information leaflet. In keeping with DoH advice we should consider cochlear patients for a day-case procedure.

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0098

Availability of treatment guidelines for the management of anesthetic emergencies in areas where general anaesthesia is administered - the experience of one pediatric centre

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Introduction. Anesthesiologists may be confronted with sudden unexpected emergencies where the patient's life depends on a rapid and appropriate response. These 'time critical' emergencies can be task saturated, that is, too much to do and not enough time in which to do it. "As task saturation increases, performance decreases; as task saturation increases, executional errors increase. Emergency checklists reduce task saturation, lower stress and free the mind. In aviation a checklist is designed to get pilots pointed in the right direction by taking an action that pulls them through task saturation." [1] While the Association of Anaesthetists of Great Britain and Ireland (AAGBI) and Resuscitation Council (UK) have produced treatment guidelines for the management of a number of anesthetic emergencies, they may not necessarily be readily available when needed. The purpose of this audit was to establish whether these emergency treatment guidelines are readily available in areas of our hospital where anesthesia and or sedation are performed.

Methods. Taking five 'time critical' emergencies (cardiac arrest, anaphylaxis, malignant hyperthermia, local anaesthetic toxicity and major haemorrhage) [2, 3, 4] into consideration, we recorded the presence or absence of emergency treatment protocols on or near the anaesthetic machine in all areas of the hospital where a general anaesthetic and or sedation may be administered.

Results and Discussion. Of the twenty areas where general anaesthesia and or sedation is administered, none had all five emergency treatment guidelines readily available. While Advanced Life Support and anaphylaxis treatment guidelines were available in the majority of locations (85%), only 8% had treatment guidelines for malignant hyperthermia. In aviation, emergency checklists comprise a memory component and a list to consult after the time critical actions have been made. In order to enhance patient safety, emergency treatment guidelines should be readily available to all anaesthesiologists in the OR.

Conclusions. Emergency treatment guidelines should be readily available on all anaesthetic machines for anaesthesiologists to consult as is the case with emergency checklists in the aviation industry. This will ensure that all critical steps have been taken and that the emergency treatment is completed according to current recommendations.

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0101 **Airway edema after cidofovir injection**

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Introduction

Recurrent respiratory papillomatosis (RPL) affects upper respiratory tract causing potential life-threatening airway obstruction. Reported incidence is 4.3:100000 children.¹ The laser destruction plus adjuvant treatment is the favored procedure.^{1,2}

We report a rare event of airway edema after cidofovir injection (adjuvant treatment) in a 7- year- old boy.

Methods:

The anaesthetic plan included an intravenous anaesthesia with Glidescope® intubation due to the possibility of difficult airway. Standard ASA plus Bis and muscle relaxation monitoring was used.

Results:

Comorbidities: Previous diagnosis of intermittent asthma that subsisted after adenoidectomy, turbinectomy, and laser destruction of papillomatosis lesions 15 months before. At physical exam cardiopulmonary auscultation was normal and no respiratory complaints were referred. After induction with 0.1 mg of fentanyl, 60 mg of propofol, and 20 mg of rocuronium a laryngoscopy with Glidescope® was accomplished with vocal cords visualization (multiple small papillae were seen on the arytenoids and vocal cords). At the day of surgery the adequate size of Laser-flex® tube for the patient was not available. Due to clinically severe papillomatosis invasion (conditioning hoarseness) it was decided to proceed with surgery with a PVC orotracheal tube. The patient was intubated with an oral Rae endotracheal tube 5. The anaesthesia maintenance was managed with a propofol infusion and boluses of fentanyl, O₂/Air with an inspired fraction of oxygen less than 30% (to decrease the risk of combustion) During the procedure heart rate, noninvasive blood pressure remained within normal range and oxygen saturation above 95%. It was administered 8 mg of dexamethasone, 125 mg of methylprednisolone (for prevention of laryngeal edema), and 500 mg of paracetamol, plus 50 mg of tramadol for analgesia. After the surgery, which lasted 90 minutes, the surgeon injected cidofovir. Airway edema was noticed and extubation was delayed.

The patient was transferred intubated to the Post Anaesthetic Care Unit. However, due to the persistence of airway edema and phlyctenae the patient was transferred to the Pediatric Intensive Care Unit. Only at the 7th postoperative day the nasofibroscopy showed edema resolution in the arypiglotic fold and vocal cords. However, due to development of a septic shock, with respiratory focus (isolation of a *Serratia marcescens*) solely at the 19th postoperative day was the patient considered eligible for extubation.

A profound venous thrombosis at the left iliofemoral vein (the place of the central venous catheter) delayed hospital discharge until the 31th postoperative day.

Discussion:

Laser airway surgery is always challenging. A plan of action was set and precautions against direct laser strike injury were taken (including restraining inspired fraction of oxygen to below 30% and following the usual protocol to insure operating room and personnel safety).^{1,3} However an event not reported in the literature, airway edema due to cidofovir injections, compromised extubation. This unexpected setback played a role in the infection of a known opportunistic pathogen among ventilated children, delaying hospital discharge and causing severe comorbidities.

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0102 MANAGING EMERGENCIES IN PAEDIATRIC ANAESTHESIA: LEARNING NEEDS OF DUTCH ANESTHESIA RESIDENTS AND CONSULTANTS

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Introduction

In paediatric anaesthesia safety of the child has highest priority. When emergencies appear anaesthesiologists need to be able to manage these situation properly to minimize harm to the patient and prevent further deterioration. Experience in paediatric anaesthesia, preparedness to emergencies and self-efficacy are important factors defining the course of the management and the outcome of the emergency (1-3). In this study learning needs of both anaesthesia residents and consultants are explored and compared to obtain information about the incidence of certain emergencies, the perceived self-efficacy in the management of these emergencies and their interest in further training.

Methods

In total 21 emergency situations in paediatric anaesthesia were selected from the Dutch national training program for anaesthesia residents, paediatric anaesthesia literature and textbooks and a (near) incident registration of a paediatric anaesthesia department. An internet based questionnaire was developed and Dutch anaesthesia consultants and residents were invited to participate. The respondents were asked to answer three questions using a Likert scale: 1) the incidence during the previous twelve months, 2) their perceived self-efficacy to be able to manage the situation properly and 3) their interest in extra training of the situation.

Results

A total of 51 anaesthesiology residents and 311 consultants performing paediatric anaesthesia took part in this survey. The residents and consultants worked in different hospitals, dispersed over the Netherlands. The incidence of the emergencies during the last year was quite low. Consultants reported a significantly higher self-efficacy to manage these emergency situations appropriately than residents, although both groups were quite positive, except for some emergencies, e.g. airway problems. Although the perceived self-efficacy was high, consultants and residents are interested in extra training in most emergency situations. Both groups show interest in one day courses using simulation and 47% of the consultants reported to be interested in e-learning possibilities.

Discussion

Overall it can be concluded that both residents and consultants are positive about their confidence in dealing with paediatric anaesthesia emergencies, although residents score lower than consultants. Furthermore it can be concluded that both residents and consultants feel a need for further training, preferably combination of (high fidelity)

simulation with other types of teaching like e-learning. Even although the incidence reported was low, these findings can be used to further improve the training of paediatric anaesthetists and the care for children while at risk.

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0104

Developing a paediatric safe surgery checklist

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Introduction

Since the WHO launched the first Edition of its surgery safety checklist, hospitals around the world have been using this safety instrument daily to improve quality of care. With the aim of implementing this checklist in our centre, we started a search for a suitable checklist adapted to the especial needs of the paediatric patient. No suitable checklist was found, as most centres seems to be working with either the standard adult patient checklist or a minimally modified one. After comparing our findings with our perceived needs, we decided to proceed with the development of a specific paediatric checklist.

Methods

A joint commission involving the children's hospital administration, the Quality Control unit, surgical nursing and a team of paediatric surgeons and anaesthesiologists was created and two working teams formed. Each team proceeded with a revision of existing bibliography, looking for leads on specific items to include in the checklist. Each team redacted a dossier echoing their conclusions on the items to be included. During a series of meetings the group considered these conclusions and a final item list was prepared.

Two pilot checklists were prepared for validation in real conditions. After the trials, a new final design was chosen and sent to the Consejeria de Salud for final validation and implementation.

Results

After validation, two checklists were developed, one for ambulatory and major surgery. Both checklists have shown to be easy to use while including those items we feel are needed to ensure proper care for the paediatric patient

Discussion

The introduction of safe surgery checklists has demonstrated an improvement in the quality of care. However, standard available checklists aren't designed for use in the paediatric patient. With this effort we aim to close this safely gap and encourage other paediatric anaesthesia groups to join in and create specific paediatric safely checklists.

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0106 Effectiveness of a near-infrared vascular imaging system to support intravenous cannulation in children with a dark skin color; a cluster randomized clinical trial

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Introduction: Intravenous cannulation can be challenging in children with a dark skin color. Visualization of veins with near-infrared (NIR) light might be helpful. Therefore, the effectiveness of a NIR vascular imaging system (VascuLuminator: VL) was investigated in facilitating intravenous cannulation in children at the operating room in a population with predominantly dark skin color.

Methods: All consecutive children (0-15 yr) in need for intravenous cannulation at the operating room of a primary general hospital in Curacao were included in this pragmatic cluster randomized clinical trial. The presence of the VL at the operating complex was randomized in clusters of a week.

Results: The success at first attempt was 63% (27/43) in the VL Group vs. 51% (23/45) in the Control Group (p=0.27). There is a trend towards a shorter time to successful cannulation in the VL Group compared to the Control Group (159± 38 s vs. 186± 47 s; p=0.60). Subgroup analysis shows better results in children younger than 3 years of age, (success at first attempt VL Group: 61% (14/23) vs. Control Group: 35% (8/23); p=0.08) and in patients previously estimated to be difficult (success at first attempt VL Group: 50% (8/16) vs. Control Group: 8% (1/13); p=0.03).

Conclusions: NIR vascular imaging shows to be promising in intravenous cannulation in children with a dark skin color, especially in young children < 3 yr and in children previously estimated to be difficult to puncture

0107

Comparison of two anaesthesia induction techniques on neuroendocrine stress response associated with laryngoscopy and endotracheal intubation (LETI) in paediatric surgical patients: a randomized prospective study (preliminary data).

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Introduction. Physiologic response to surgical stress includes sympathetic nervous system activation as well as hormonal, immunological and haematological changes; although it enhances rehabilitation after injury, it is unnecessary in current surgical and anaesthetic practice. In contrast, attenuation of perioperative stress response has been shown to influence postoperative outcome in a positive manner [1]. Previous data support that systemic intra- and postoperative stress reaction can be altered by various anaesthetics such as sevoflurane or propofol [2]. Moreover, neonatal and paediatric neuroendocrine responses to surgery are relatively greater in magnitude compared to adult for similar procedures [3]. The aim of this study was to evaluate prolactin and cortisol levels as stress markers of sympathetic activation during LETI at children, comparing two different induction techniques.

Methods. We studied 25 children, 1-8 years old, ASA - PS 1 undergoing elective surgery under general anaesthesia. All children were premedicated with oral midazolam 0.7 mg/kg 20 min before admission to the operating theatre. Patients were randomly allocated by a blind observer into two groups.. Propofol 3 mg*kg⁻¹, fentanyl 3 µg*kg⁻¹ and rocuronium 0.45 mg*kg⁻¹ were used for anaesthesia induction in group P (n:12|) while group S (n:13) received sevoflurane 3% and fentanyl 3 µg*kg⁻¹. LETI was performed 2 mins after total intravenous and 10 min after sevoflurane based induction. Heart rate (HR) and non invasive blood pressure (NIBP) were measured before induction, 1 min and 10 mins after LETI. Venous blood samples for prolactin and cortisol level determination were obtained before laryngoscopy and 10 mins after endotracheal intubation. Independent t-test, paired t-test and x²-analysis were used for statistical purposes. Results were considered statistically significant when p<0.05.

Results. Both groups were homogenous in terms of demographic data as well as baseline HR and NIBP values. Significant reduction (p<0.05) in cortisol levels and remarkable increase (p<0.05) in prolactin levels was noted in both studied groups. Comparison between the two groups revealed that the magnitude of changes in hormonal levels was greater in group S, this being statistically significant (p=0.011) only for prolactin. HR and NIBP tended to be lower after LETI following both techniques but changes were not in favor of either group. **Conclusion.** Neuroendocrine stress response to LETI, as estimated by cortisol and prolactin levels, does not seem to be attenuated after either propofol based or sevoflurane based anaesthesia induction in paediatric surgical patients. Nevertheless, the total intravenous technique used in the present study apparently provides a better outcome profile as regards prolactin level changes compared to sevoflurane induction.

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CAUDAL EPIDURAL BLOCK IN AWAKE INFANTS FOR NEUMOREDUCTION MANAGEMENT OF INTUSSUSCEPTION

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INTRODUCTION

Intussusception is produced by the invagination of one portion of the intestine into another. It is the most common cause of intestinal obstruction in young children. It is more frequently in male than females. Over 50% of the cases occur in children under one year of age. Ninety percent of cases is idiopathic. The general anesthesia approach has big potential problems of difficult airway, highly reactive airway and full stomach. The tolerance, efficiency and outcome of caudal block performed in awake infants in radiology suite, far to operating room is an interesting anesthesia approach.

METHODS

Over a period of 43 months was admitted 29 infants with invagination's clinical diagnosis. One infant was in poor condition and were treated initially by surgery. In one patient the final diagnosis was wrong. In 63% of 27 patients (17) air neumoreduction was successful. Those procedure was doing without pediatric anesthesiologist in radiology suit. In 26% (7 patients) was doing with iv sedation and was successful. In 11% (3 patients) caudal block was the anesthesia approach. This infants was at acute upper respiratory infection. One of them, the neumoreduction was successful. In the other 2 patients, after three failure attempts, the infant is taken straight to the operating room for laparotomy. In this cases the caudal block was sufficient to complete the surgery. Written informed consent was obtained from each infant's parent(s). Monitoring includes NIBP, ECG. Caudal epidural block technique used as a single shot with Quincke Needle 23 G with bupivacain 0, 25 % with epinephrine 1:200000, 4 mg. kg-1 plus normal saline with end point volumen 2 ml. kg-1. Target dermatome T4. Definitions for bradycardia and hypotension were a decrease in heart rate and MAP > 25% from initial values and treated with atropine 0.01 mg kg-1 and a fluid bolus of 10 ml kg-1, respectively. Insufficient blockade was defined as increase of HR > 15% from initial value and/or any movements at insufflating air or at skin incision.

RESULTS

The 63% of our patients were done the neumoreduction without monitoring and anesthesia. In 11% of patients, the concomitant upper respiratory infection with a procedure outside of operating rooms raised the question of whether a caudal block would be a good choice. Caudal anesthesia was successful in 100% of patients. Bupivacaine dosis is not associated with central nervous and cardiovascular system toxicity in our awake infants. Performance of caudal block was well tolerated by the infants. 10 minutes after caudal block the patients are quiet, awake and slightly decreased mobility of the lower extremities. Change in vital signs following caudal block, was no significant (heart rate, systolic blood pressure or arterial oxygen saturation). Mean time to finish surgery was 100 min.

DISCUSSION

Caudal anesthesia in awake high risk infants is a safe anesthetic approach to neumoreduction. The possibility of using the same technique for invasive and non-invasive procedure is interesting in the management infants at high risk

0111 Additive effect of prone position and HFOV - evaluation of the sequence of both methods on an experimental ARDS

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Introduction

The aim of study was to determine the effect of prone position and HFOV in an experimental model of ARDS

Methods

The study included 40 experimental piglets. After anaesthesia and instrumentation, the animals were ventilated PVC. Lung damage induced by repeated bilateral lung lavage with saline (38 ° C, 30 ml / kg) to achieve PaO₂/FiO₂ < 200 Hg mm. After induction of ARDS, the experimental animals were randomized into 5 groups - the control group (PCV in the supine position throughout the experiment), PP (PCV in the prone position and then in the supine position), HFOV (HFOV in the supine position throughout the experiment), HFOV + PP (HFOV in the supine position, after 6 hours of prone position and then supine position), PP + HFOV (PCV in the prone position, after 6 hours HFOV, further rotation of supine and prone positions, as the PP group. Monitored parameters pH, PaO₂, PaCO₂ and oxygenation index.

Results

In terms of oxygenation (PaO₂) was not the difference between PP and HFOV , higher PaO₂ was achieved in PP+HFOV than in HFOV+PP. CO₂ elimination was better in HFOV+PP than in PP+HFOV, no difference between PP and HFOV. There was no significant difference in OI between PP and HFOV, HFOV+PP had a lower OI than HFOV+PP. Conclusion: Between PP and HFOV were no differences in oxygenation and CO₂ elimination, the combination of HFOV+PP is more effective in terms of oxygenation.

0114

Venepuncture and vein cannulation with support of the AccuVein AV300 veinscanner in paediatric patients in a pre-operation setting

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Introduction

The AccuVein AV300, a portable, non-contact vein visualization device, acts as one of the techniques, such as ultrasound guidance [1], trans illumination by light-emitting diode [2] or near-infrared spectroscopy [3], used for facilitating venepuncture and vein cannulation especially in infants and children. So far few reports are available about its effects on superficial vein punctures in paediatric patients in operating rooms.

Methods

From January 2011 to March 2011, a total of 238 patients were included in the trial. They were divided into two groups in a non-random way, in the intervention group venepuncture was supported by AccuVein AV300, in the control group venepuncture was performed as usual without any supporting device. Data were collected on gender, age, weight, received general anaesthesia or not, received local anaesthesia by EMLA or not, the time and number of attempts until successful cannulation for both groups pre-operation in the paediatric operating rooms. Data were analysed by SPSS18. P-values <0.05 were considered significant.

Results

There were 114 cases in the intervention group with a mean age of 53 months, and 124 cases in the control group with a mean age of 43 months. Mean time until success was longer in the intervention group (3.5 min) than in control group (1.7 min) (P<0.01). Mean number of attempts was higher in the intervention group (2.19) than in the control group (1.56) (P<0.01). And mean one-attempt-success rate was lower in the intervention group (47%, 51 in 114 cases) than in the control group (73%, 90 in 124 cases) (P<0.01).

Discussion: The use of the AccuVein Av300 veinscanner was not able to reduce neither the time nor the number of attempts until successful cannulation of peripheral veins, although a good visibility of peripheral veins was provided as it is described for other vein imaging systems [2,3]. A study with a randomised-controlled design on another non-contact vein viewing system² reported higher success rates at first attempt and less time taken until successful peripheral venous cannulation with the help of the device named light-emitting diode. In our study, errors in size and position between the vein shadow and the vein itself may have contributed to the opposite outcome.

Conclusion

So a perfect visibility seems to be not enough for successful venepuncture, the experience in tactile location and judgment of the reasonable puncture site is also essential. Further studies with a randomised-controlled design and a larger population of patients need to be

conducted to clarify the benefit and utility of these devices.

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0119

MEASURE OF CARDIAC OUTPUT WITH A PULSE CONTOUR METHOD, PRAM, COMPARED TO THERMODILUTION IN PEDIATRIC HEART TRANSPLANTED PATIENTS

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Introduction

Sugammadex reverses neuromuscular blockade induced by aminosteroids neuromuscular blockers (ANB). Its efficacy and safety has been proved in adults. Due to its new mechanism of action is not affected by the complex physiology of the neuromuscular junction or the maturation of the elimination, metabolism and excretion organs. We expect no modifications on pharmacokinetics and/or pharmacodynamics of reversal in paediatric patients. The aim of current study is compare the efficacy and safety of reversal with sugammadex versus neostigmine, in paediatric patients with moderate blockade by rocuronium.

Methods

Multicenter, observational and retrospective study. After ethical committee approval and informed consent obtained we included 40 patients 2-9 years old undergoing short length elective surgery under general anesthesia and muscular relaxation. Neuromuscular function was monitored by acceleromyography (TOF-Watch^(R) SX, Schering-Plough MSD) after period of stabilization and optimal calibration. Main outcome variable was time from beginning of administration of sugammadex or neostigmine to reach a ratio TOF 0.9. Other variables were rocuronium onset-time, MBP and HR 1, 3 and 5 minutes after reversal. Statistical analysis was SPSS 17, using t-Student for independent sample and significance was reported at $p < 0.05$.

Results

Demographic data were homogeneous in both groups.

There were no statistical significant differences concern to demographic, surgical and block data (on-set of maximum block) between both groups. The reversal of blockade was significantly superior in the sugammadex group (reversal time $1 \pm 0,3$ min.) vs neostigmine group ($11,5 \pm 7,4$ min.)

Discussion

At present, there are not enough trials using sugammadex in paediatric population. Plaud et al. did not show differences according to the age, being similar in children, teenagers and adults.

Conclusions

Sugammadex $2\text{mg} \cdot \text{k}^{-1}$ reversed effective and safely, in one minute, moderate neuromuscular blockade induced by rocuronium in pediatric patients >2 years, undergoing elective surgery. This data shows sugammadex as fast and secure alternative to standard

reversal by neostigmine.

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0120

Rocuronium induced neuromuscular moderate blockade in paediatric surgery. Reversal with sugammadex.

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Introduction

Sugammadex reverses neuromuscular blockade induced by aminosteroids neuromuscular blockers (ANB). Its efficacy and safety has been proved in adults. Due to its new mechanism of action is not affected by the complex physiology of the neuromuscular junction or the maturation of the elimination, metabolism and excretion organs. We expect no modifications on pharmacokinetics and/or pharmacodynamics of reversal in paediatric patients. The aim of current study is compare the efficacy and safety of reversal with sugammadex versus neostigmine, in paediatric patients with moderate blockade by rocuronium.

Methods

Multicenter, observational and retrospective study. After ethical committee approval and informed consent obtained we included 40 patients 2-9 years old undergoing short length elective surgery under general anesthesia and muscular relaxation. Neuromuscular function was monitored by acceleromyography (TOF-Watch^(R) SX, Schering-Plough MSD) after period of stabilization and optimal calibration. Main outcome variable was time from beginning of administration of sugammadex or neostigmine to reach a ratio TOF 0.9. Other variables were rocuronium onset-time, MBP and HR 1, 3 and 5 minutes after reversal. Statistical analysis was SPSS 17, using t-Student for independent sample and significance was reported at $p < 0.05$.

Results

Demographic data were homogeneous in both groups. There were no statistical significant differences concern to demographic, surgical and block data (on-set of maximum block) between both groups. The reversal of blockade was significantly superior in the sugammadex group (reversal time $1 \pm 0,3$ min.) vs neostigmine group ($11,5 \pm 7,4$ min.)

Discussion

At present, there are not enough trials using sugammadex in paediatric population. Plaud et al. did not show differences according to the age, being similar in children, teenagers and adults.

Conclusions

Sugammadex $2\text{mg} \cdot \text{k}^{-1}$ reversed effective and safely, in one minute, moderate neuromuscular blockade induced by rocuronium in pediatric patients >2 years, undergoing elective surgery. This data shows sugammadex as fast and secure alternative to standard

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0121

Preliminary outcomes of pediatric I-Gel use.

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Background and Goal of Study:

The I-GEL LMA is a supraglottic device with a non-inflatable cuff that adapts to the hypopharyngeal anatomy and has recently introduced in pediatric practice.

The aim of this study was to describe insertion characteristics and airway seal in pediatric population.

Material and Methods:

A total of sixty children under 30kg were analyzed of the one hundred we will enrolled. We excluded prematures or neonates below 3 kg, or with lung disease, difficult airway or risk factors for regurgitation. Standard monitoring and pre-oxygenation was performed. Iv (propofol 3-5 mg/kg, fentanil 2mcg/kg and atropine if needed) or inhalational induction and iv canalization was performed. We did not use neuromuscular blocking agents. 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: time for insertion, 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 59 of the 60 patients. One case required intubation because of its important leak. One was changed by the superior 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

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0123

PULMONARY HEMORRHAGE IN A CHILD WITH BERNARD SOULIER SYNDROME:CASE REPORT

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INTRODUCTION

Bernard Soulier Syndrome is a congenital bleeding disorder characterized by thrombocytopenia and large platelets. Pulmonary haemorrhage is a rare, life-threatening complication of anesthesia that can be associated with negative airway pressure. Neonates and young infants are able to generate more negative pressure because of their compliant chest wall, mainly due to laryngospasm. We describe one case of pulmonary hemorrhage in an infant with thrombocytopenia, who developed a laryngospasm after extubation.

CASE REPORT

A 1-year-old female, ex-premature, ASA II, Bernard-Soulier syndrome asymptomatic, 9 Kg, was admitted for cleft palate repair. Before surgery her platelet count was 66.000/ μ L, Hgb 11.5 g/dL, INR 1.01, PFA 100 normal, and desmopressin has been administered, as recommended by the Hematologist. Standard monitoring equipment was used and general anesthesia was induced with 0.15mg atropine, 20mg propofol, 25 μ g fentanyl and 5mg rocuronium. Tracheal intubation was uneventful. It was maintained with sevoflurane 2.5% in 40%O₂. 2mg of dexametasone and 35mg of hydrocortisone were administered. Analgesia was performed with 130mg paracetamol, 9mg tramadol and 1.5mg metoclopramide. During the procedure, the patient had a stable blood pressure, heart rate and oxygen saturation (SpO₂) 99-100%. A volume of 100ml of normal saline solution was administered. The duration of surgery was 60 minutes and surgical hemorrhage was negligible. After extubation, she developed a laryngospasm with decreased SpO₂ to 84% that solved after 2 minutes of manual ventilation with positive pressure and 100% O₂. Pulmonary auscultation was normal. 40 minutes later, in the recovery room, respiratory deterioration occurred with signs of respiratory distress, paleness, SpO₂ 88% (O₂ 4L/min.) and diminished breath sounds over the right side of the chest. She was transferred to the Pediatric Intensive Care Unit (PICU), and was intubated and ventilated. Chest X-ray revealed a diffuse bilateral nodular infiltrate, compatible with pulmonary hemorrhage. Recombinant factor VIIa, K vitamin, platelets and aminocaproic acid were immediately administered. During the Stay in PICU, she developed ARDS, and was ventilated with High Frequency Oscillatory Ventilation (HFOV). A few episodes of spontaneous pulmonary bleeding occurred associated to hemodynamic instability. One week later conventional ventilation was restarted and she was extubated after 5 days. At the 21st day after admission in the Hospital, the patient was discharged without sequelae.

DISCUSSION

Few cases are reported in the literature about pulmonary hemorrhage during anesthesia, and even fewer related with Negative-pressure pulmonary oedema. Although the precise

etiology of the bleeding in pulmonary hemorrhage is uncertain, the disruption of pulmonary capillaries could play a role.² In this case, there are many reasons for such a dramatic improvement. Blood in the airway is one of them, although it seems that acute airway obstruction due to laryngospasm could have conditioned Negative-pressure pulmonary hemorrhage. Other additional factors such as thrombocytopenia may be important in its development. However, due to its asymptomatic familiar and personal history, normal PFA100, negligible hemorrhage at surgical incision, it was considered that the infant didn't have a bleeding tendency.

0124

The use of the new paediatric I-Gel laryngeal mask with fibroptic control. A prospective study.

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INTRODUCTION: The I-gel is a relatively new supraglottic airway device that has been used in adult patients with proven safety and efficacy. Until now this device was only available in sizes 3 to 5, and had only been evaluated in patients over 30kg. We present our results using the new paediatric sizes of this device.

METHODS: Thirty consecutive paediatric patients undergoing general surgical procedures were anaesthetized and I-gel laryngeal mask airway introduced without the use of a paralyzing agent. Ease of insertion and number of attempts needed to achieve adequate ventilation were recorded. Leak pressure during mechanical ventilation, as well as mean and peak airway pressure were also recorded. We also looked for any complications derived from the use of the airway device. Adequate position was confirmed using a fibroptic scope.

RESULTS:The I-gel laryngeal mask airway was successfully placed and used for mechanical ventilation in all cases. Insertion was found to be easy or very easy in 93,3% of the patients. Leak pressure was 26,9 cmH₂O. Adequate tidal volumes were achieved, with mean airway pressure during mechanical ventilation of 6,7 cm H₂O. Direct fibroptic vision of the glottis confirmed satisfactory positioning of the device (grade I, II or III views) in more than 85% of cases.

CONCLUSION: In view of the favourable results, the paediatric sizes of the I-gel laryngeal mask airway seem to be a safe and effective device for paediatric airway management during short surgical procedures.

0126

"Monitored Anaesthesia Care for Magnetic Resonance Imaging in Children - A General Hospital Experience"

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Introduction: Anaesthesia procedures in remote locations became more popular over the years. Monitored Anaesthesia Care (MAC) to children who need to perform a (MRI) is a common practice in the way that this procedure is potentially scary for the child and is motionless is necessary. On our general hospital, a total of 394 children underwent to a MAC procedure in the context of performing a resonance. This is not risk-free and remote locations can be a challenge to the Anesthesiologist, as they often lack the routine setup and check, staff and resources of an operating room. In our hospital we hardly try to prevent this precise type of situation. This research intends to show how we work and to characterize our population.

Methods: The past year, 2010, in our hospital, a total of 394 children have been submitted to a Magnetic Resonance Imaging procedure under MAC. We selected a sample of 203 of these patients (approximately 50%) and collected their data about age, sex, type of MAC, use of contrast agent, time of anaesthesia, medical specialty, mental retardation or similar, region of the body and complications. The age has been divided in 5 classes; the MAC had been classified in general inhalatory anaesthesia (and in this case, if performed with laryngeal or facial mask), general intravenous anaesthesia or sedation. The Medical Specialties were divided in Paediatrics (mostly Paediatric Neurology), Orthopaedics, Neurosurgery, Ophthalmology, ORL and Endocrinology. The body has been organized by cerebral, thorax, abdomen/pelvis and members areas. Microsoft Excel© software was the choice for organizing and treating data, as well as to design graphics that help their interpretation.

Results and Discussion: From the whole population, 50% are children between 1 and 5 years and 25% between 6 and 10 years. 56% were boys and 44% girls. 79% had been performed a general inhalatory anaesthesia and 21% a sedation technique. 86% of the Anaesthesiologists preferred a laryngeal mask instead of a facial one (with 14%). The big majority of our children were Paediatric Neurology patients, with 75%, followed by 14% from Neurosurgery, 6% Orthopaedics and 5% Ophthalmology. The other Specialties are residual. 49% were ASA2 patients, 27% ASA1, 21% ASA3 and 3% ASA4. The head is responsible for 85% of MRI, 6% thorax, 5% members and just 4% abdomen/pelvis. 46% of patients had some degree of mental illness or retarded development. Just 3% of the procedures had some kind of complication even contrast agent being used in 27% of children.

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0127

Post operative airway management in high risk patient groups following adenotonsillectomy surgery

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Introduction Tonsillectomy and adenoidectomy are common paediatric procedures often undertaken as day case surgery. It can be easy to run into problems with a sub-section of these patients who are anaesthetically very challenging. The high risk group with obstructive sleep apnoea (OSA) can pose problems particularly regarding post operative airway management. These concerns lead to the requirement of paediatric intensive care (PICU) for all high risk patients in some centres. In our hospital, nasopharyngeal airways (NPAs) are fashioned and sized individually for each “high risk” patient and inserted prior to extubation. This enables post operative care to be delivered on a ward rather than PICU. Our aim was to discover what are the risk factors for requiring insertion of a nasal prong? We propose that this maintains safe post operative airway management and decreases our requirement for PICU beds. Dissemination of our methods could be translated to other centres.

Methods Prospectively collected data was taken from the Ear, Nose and Throat (ENT) database at our hospital. We searched for all patients who had received adenotonsillectomy surgery during the time period 2005-2010. We recorded which patients received a nasal prong at the end of surgery and their co-morbidities. We also looked at the number of admissions to PICU following this particular surgery over this time scale.

Results/Discussion From the 1447 consecutive admissions for adenotonsillectomy, 183 underwent NPA insertion at the end of surgery. All the patients who had a NPA inserted had a diagnosis of moderate or severe obstructive sleep apnoea. The other high risk groups requiring NPA prior to extubation were patients aged less than 24 months, children with obesity, Downs syndrome, Crouzons or Aperts syndromes, other craniofacial deformities and those with neuromuscular disorders. Over this 5 year period, 28 patients required admission to PICU. Prior to the introduction of NPAs post adenotonsillectomy PICU beds were booked for all high risk patients although the majority of beds were not actually required. Our hospital fashions a NPA from an uncuffed paediatric ETT with the internal diameter 0.5-1.0mm smaller than the age appropriate ETT used to intubate for surgery. The length of tube is adjusted specifically for each patient as it is inserted under direct vision by the ENT surgeons before extubation. The external end of the tube is sutured to a portex endo-tracheal tube holder with flanges which are unfolded and fixed to the face. The NPA remains in situ overnight and it is removed day 1 post operatively, patients are then discharged. In severe situations the NPA may remain in place for a few weeks post operatively.

Conclusion NPA adjuncts when correctly sized and fitted prevent post operative airway obstruction following adenotonsillectomy in a high risk group of patients. Thorough pre-operative assessment allows detection of this high risk cohort. If this is achieved, insertion of NPA devices ensures safe post-operative care by appropriately trained nurses on a standard ward, relieving the requirement for PICU.

0130

Dexketoprofen vs racemic ketoprofen for treatment severe postoperative pain in elder children.

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Introduction

In search of safe and effective methods of postoperative analgesia, we continued to research dexketoprofen. We based on previous experience of application of racemic ketoprofen in children and positive results of treatment with dexketoprofen of medium intensity postoperative pain in pediatric urology. We compared racemic detoprofen with dexketoprofen and its combination with opiates for treatment severe postoperative pain.

Patients and methods

74 healthy boys (ASA I), age $15,3 \pm 2,2$ [13-17], (after permission of ethics committee of hospital and informed consent of parents), traumatic and long operations were performed (ureteropieloplasty, ureteral reimplantation) with standardized anaesthesia (induction TIVA propofol 3-4 mg/kg, fentanyl 7-10mg/kg, or sevoflurane minimal flow anaesthesia, atracurium 0.4 mg/kg; maintenance – infusion propofol 10mg/kg/h or sevoflurane, brief supporting – ETT) were randomly assigned to receive either racemic ketoprofen 2 mg/kg intravenously slowly (RK, 36 patients) or dexketoprofen trometamol 1 mg/kg intravenous bolus (DK, 38 patients) at induction of anaesthesia. Patients received repeated doses of drug in postoperative period (up to 3 days) depending on a necessity (on achievement of 4 points on the VAS). Level of pain (was fixed time to achieve 4 points on the VAS), complications, side effects (PONV, breath or hemodynamic depression, gastrointestinal bleeding, kidney or cardiac complications, haemostasis changes) and additional use of opiates (meperidine or morphine) were registered.

Results

The median (\pm SD) time to achieve 4 points by VAS after surgery were $206,3 \pm 53,3$ min after RK and $252,5 \pm 48,3$ min after DK respectively. Quantity of additional use of opiates were $1,05 \pm 0,12$ (group RK) vs $0,73 \pm 0,21$ (group DK). No adverse events related to renal, gastrointestinal or cardiovascular function were detected during the study.

Conclusion

Dexketoprofen trometamol appeared to show a better tolerability profile compared with the racemic ketoprofen, decreased necessity of opiates in postoperative period, possibility of his application for treatment of severe postoperative pain in elder children and requires a further study.

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