

POSTER PRESENTATIONS

THURSDAY 13:30 CLINICAL PRACTICE

ANAESTHETIC MANAGEMENT OF PEDIATRIC PATIENTS IN A CARDIAC CATHETERIZATION LABORATORY: A THREE YEAR REVIEW.

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Introduction. The breakthroughs made in diagnostic and interventional catheterization techniques have changed significantly the operative and nonoperative approach to the patient with Congenital Heart Disease (CHD). Cardiac catheterization is rarely tolerated by the awake paediatric patient and frequently requires general anaesthesia. The goal of anaesthetic management in this setting is maintenance of circulatory homeostasis despite potential destabilizing events accompanying the diagnostic or therapeutic procedures. This is complicated by the diversity of lesions and the variety of therapeutic approaches. Congenital cardiac defects vary widely in severity, anatomic combinations, and pathophysiologic conditions. When planning for sedation or general anaesthesia the anaesthesiologist must understand the underlying pathophysiology, the purpose of the study, and the anaesthesia-induced changes in hemodynamic parameters. The plan must include the same level of preparation that applies in caring for these patients in the operating room. We review our experience in the anaesthetic management of paediatric patients who, in the last three years, underwent procedures in the cardiac catheterization laboratory.

Methods. A retrospective observational review of the anaesthetic records of all paediatric patients who underwent procedures, from January 2006 to December 2008, in the cardiac catheterization laboratory of our hospital.

Results. A total of 621 anaesthetic records were reviewed, 50.1% belonged to individuals of the male gender. Patients ranged from less than 7 hours of life to 18 years of age with 25.3% (n=157) of the patients falling in the 12-18 age group, followed by 24.0% in the 6-12 age group. According to the ASA classification, 30.9% (n=192) were ASA II, 27.4% (n=170) were ASA III, and 21.6% (n=134) were ASA IV. Diagnostic procedures accounted for 63.1% (n=392) of all cases with diagnostic catheterization being done in 40.6% (n=252) of all cases. Interventional catheterization occurred in 35.9% (n=223) of the procedures with 27.0% (n=68) of them corresponding to percutaneous closure of atrial septal defect (ASD), and 19.0% (n=48) to percutaneous closure of a Patent Ductus Arteriosus (PDA). General anaesthesia was chosen in 88.3% (n=548) of the procedures [total IV anaesthesia in 55.4% (n=344) and balanced general anaesthesia in 32.9% (n=204)], and sedation in only 6.9% (n=43) of all patients. Propofol was the drug of choice in 62.3% (n=387) of patients; Ketamine was employed in 55.4% (n=344) of the anaesthetic interventions. Alfentanil was the most used opioid in all cases with 48.8% (n=303). When it came to airway management, 77.6% of the patients had orotracheal intubation. Complications arose in 4.0% (n=25) of all interventions, with 20.0% of them corresponding to arrhythmias. The major difficulty encountered in the review of the anaesthetic records was the lack of registered information; 15.6% of the anaesthetic records lacked some of the required information.

Discussion: The anaesthetic management of paediatric patients in the cardiac catheterization laboratory, as with other procedures located remote from the operating room, presents the anaesthesiologist with a unique set of challenges. The anaesthetic plan must consider the wide variety of congenital defects, the specific cardiology objectives of the procedure and the impact of the anaesthetic management in facilitating or hindering the interventional procedure. Because of hemodynamic variability of many of these patients, as well as changing anaesthetic requirements, administration of ketamine or propofol is appropriate. Potent inhaled anaesthetics are generally not used as the primary anaesthetic and are reserved for adjunctive anaesthesia. The success of these interventions will undoubtedly result in a widespread availability and use over the next few years.

LEFT VENTRICULUM DIASTOLIC FUNCTION IN PEDIATRIC SEPTIC SHOCK

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Sepsis is an important cause of paediatric morbidity and mortality. One of the causes of septic mortality is hemodynamic disorders and low cardiac output secondary to preload failure. The same patients demonstrate preload failure after aggressive volume replacement. We have assumed, that diastolic ventricle dysfunction is a one cause of these phenomena.

Methods. Ultrasound impulse-wave Doppler evaluation of some transmitral flow parameters with US-scanner "Ultima PA": maximum and minimum velocity and area of early (Vmax E, Vmin E, VTI E) and atrial systolic (VmaxA, VminA, VTI A) vive, ejection time E and A vive, deceleration time (DT) E vive, isovolumetric relaxation time (IVRT) of left ventricle. The end diastolic left ventricular pressure (EDLVP) calculate on Stork formula $EDLVP = 1,06 + 15,15 * VTI \text{ peakA} / VTI \text{ PeakE}$. We evaluated these parameters in 21 paediatric patients with septic shock. Shock diagnosis in accordance with SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference consensus (2001). The mean patients age are $25,6 \pm 11,1$ month. Control group consisted from 21 practical healthy child with mean age $24,5 \pm 4,0$ month.

The estimation of reliability of the averages quantities between groups has been carried out according Student criteria.

Results. The reliable increase maximum and minimum velocities of atrial systole end decrease maximum and minimum early velocities in patients of evaluation group were demonstrate. The IVRT and DT of left ventricle were less, then in control group. In septic patients we evaluated a decrease VTI E and E/A proportion. EDLVP in septic shock patients was more reliable then in controlled (table 1).

Table 1

Diastolic function in pediatric septic shock (M±m)

| Values | Evaluation group, n=21 | Control group, n=21 |
|--------------------------|------------------------|---------------------|
| V max A (sm/s) | 73,3±6,9* | 68,6±3,5 |
| V min A (sm/s) | 48,9±8,3* | 31,7±3,1 |
| V mean A (sm/s) | 48,2±5,3 | 44,0,0±2,9 |
| V max E (sm/s) | 76,6±6,9** | 107,8±3,0 |
| V min E (sm/s) | 13,3±1,0 | 15,2±0,7 |
| V mean E (sm/s) | 34,4±2,8** | 44,0±1,1 |
| ET A (msec) | 128,4±31,5 | 87,3±4,9 |
| ET E (msec) | 152,1±34,2 | 122,7±6,3 |
| DT E (msec) | 52,5±3,9*** | 76,8±2,6 |
| VTI A (sm ²) | 3995,3±430,4 | 3744,1±195,9 |
| VTI E (sm ²) | 3744,9±416,0** | 5620,6±256,2 |
| IVRT (msec) | 56,7±9,0** | 90,5±2,5 |
| E/A | 1,10±0,14** | 1,62±0,11 |
| EDLVP (mm Hg) | 19,5±2,8* | 11,5±0,8 |

*- p<0,05, ** - p<0,01, *** - p<0,001– reliable distinction under evaluation and control groups

Discussion. So, we restored relaxation and restrictive diastolic left ventricle disorders in our patients with pediatric septic shock. We have assumed, that diastolic disorders were secondary and according myocardial hypoperfusion and inflammatory infiltration with impairment energy production. Left ventricle diastolic filling was partially compensated with atrial systolic flow.

Conclusion:

1. Paediatric septic shock is accompanied with severe combined impairment of left ventricle diastolic function (relaxation and restrictive).
2. Left ventricle diastolic dysfunction may difficult volume restore therapy, reduces effective preload and cardiac output.
3. This data may improve volume and sympatomimetic support in pediatric septic shock.

UPPER AIRWAY COMPLICATIONS AFTER GENERAL ANAESTHESIA WITH ENDOTRACHEAL INTUBATION OR LARYNGEAL MASK AIRWAY (LMA).

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Introduction : The use of laryngeal mask is known to cause less trauma to the airways than endotracheal intubation. The aim of this study was to compare airway complications in children anesthetized for minor surgical or urological procedures with the use of laryngeal mask or endotracheal tube.

Methods: In this retrospective study 1178 consecutive surgical cases performed under general anaesthesia were analyzed. All patients were ventilated through either endotracheal tube or laryngeal mask (classic LMA, or ProSeal-PLMA); induction was either intravenous (propofol or thiopentone), inhalation (sevoflurane) or combined. Fentanyl was used for analgesia, atracurium or mivacurium for endotracheal tube placement. During anaesthesia pulse oximetry, capnometry, and ECG curve were used for continuous monitoring. The incidence of upper airway complications was estimated by means of counting the cases of desaturations < 90%, caused by cough, stridor or laryngospasm, as well as the use of dexamethasone during emergence from anaesthesia. The Chi2 test was applied and STATISTICA 8.0 (StatSoft, USA) package was used for calculations.

Results: 873 children were intubated, 275 received classic LMA and 30 PLMA for ventilation. Their mean age was 7,4 years (\pm 5,3), in most patients (584) intravenous induction was used. There were 221 cases of upper airway complications, 182 of them (20,8%) occurring in intubated children, 37 (13,5%) in those ventilated by means of LMA and 2 (6,6%) in those where PLMA was used. The difference between intubated children and those anesthetized with the use of any laryngeal mask was statistically significant ($p=0,01$), there was no such difference between both LMA groups ($p=0,40$), but the number of patients in the PLMA group was too small.

In cases with anaesthesia duration < 1 hour the incidence of complications was 19% in intubated children, and 14% in those where any LMA was used ($p=0,02$), when anaesthesia lasted more than 1 hr the incidence was 23,4%, and 11,5%, respectively ($p=0,03$).

There was no difference in complication rate according to the method of induction ($p=0,93$).

Discussion: The incidence of any airway complication was higher than in other series [1], this was due to broad definition of complications. The use of laryngeal mask airway proved to be superior to endotracheal intubation in terms of airway problems during emergence from anaesthesia.

References:

- 1.Lardner DR, Cox RG, Ewen A, Dickinson D. Comparison of laryngeal mask airway (LMA)- Proseal and the LMA-Classic in ventilated children receiving neuromuscular blockade. *Can J Anaesth.* 2008; 55: 29-35.
2. Tartari S, Fratantonio R, Bomben R, Paolazzi M, Gritti G, Alvisi R. Laryngeal mask vs tracheal tube in pediatric anesthesia in the presence of upper respiratory tract infection. *Minerva Anesthesiol.* 2000; 66: 439-443

ENDOTRACHEAL TUBE MALPOSITION IN PAEDIATRIC PATIENTS IN A MAJOR TRAUMA CENTRE.

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Introduction. Malposition of the endotracheal tube (ETT) can have a direct detrimental effect on patient care ⁽¹⁾ and is common in paediatric practice ⁽²⁾. Clinical signs alone cannot rule out endobronchial intubation ⁽³⁾ and therefore thoracic imaging is routinely performed.

The aim of this audit was to calculate prevalence of malposition of the ETT in children intubated during acute trauma. We also wished to explore factors leading to this and subsequent consequences.

Methods. The information was obtained from our Paediatric Trauma Database, which contains prospective information on all paediatric trauma calls in our trust between May 2008 - 2009.

Demographic plus specific data was analysed, including geographical site of intubation, length of insertion of the ETT at the lips and Radiologist's reports on imaging of the thorax with regard to appropriateness of position and pathology. We calculated the appropriate insertion length for each patient according to the APLS guidelines.

Results and discussion. A total of 34 patients were intubated in this period, with a median Injury Severity Score (ISS) of 25.0, (interquartile range 17.0 – 38.0) and median age of 9.5 years (interquartile range 4.0 – 12.0).

Ten cases were reported as a malpositioned endotracheal tube, five being endobronchial and five lying low in the trachea. Seven of these cases had a lobar collapse on chest radiograph or CT.

This audit did not demonstrate a difference in mortality, morbidity or length of hospital admission between those with a correct ETT placement or malposition. However, a 10 month old baby with a right endobronchial intubation causing right upper lobe collapse went on to develop chest sepsis and multisystem failure and had a total hospital stay of 110 days despite a low ISS.

Of 26 intubations performed out of hospital, 23% (95% CI 11 – 42%) were malpositioned and of 8 performed in Accident and Emergency, 50% (95% CI 21 – 79%) were malpositioned. The positions of two ETTs were clearly documented to have migrated in transit from scene to hospital.

In 18 of 20 cases, the ETT was documented as initially placed further than APLS guidelines.

Conclusion. We conclude that although being a regional paediatric unit with dedicated paediatric anaesthetists there is a significant prevalence of ETT malposition. We aim to reaudit after an intensive education programme.

References

1. Accidental bronchial intubation: An analysis of AIMS incident reports from 1988 to 1994 inclusive. McCoy EP, Russell WJ, Webb RK *Anaesthesia*. 52(1): 24-31, January 1997
2. Endotracheal tube malposition within the pediatric population: a common event despite clinical evidence of correct placement. Harris EA, Arheart KL, Penning DH, *Canadian Journal of Anesthesia* 55:685-690 (2008)
3. Auscultation of Bilateral Breath Sounds Does Not Rule Out Endobronchial Intubation in Children. Verghese ST, Hannallah RS, Slack MC, Cross RR, Patel KM, *Anesth Analg* 2004;99:56-58

UPDATE ON ECHOGUIDED VENOUS CANNULATION IN PAEDIATRIC PATIENTS

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Objective. The aim of this work is to demonstrate that today echoguided central venous cannulation in infants and paediatric patients is the golden goal.

Discussion. Percutaneous central venous cannulation, routinely performed in Intensive Paediatric Therapy, can be particularly difficult in small infants and in paediatric patients, often is associated with many complications, and remains challenging even for experienced paediatric anaesthesiologists. The internal jugular vein is the preferred access site and the catheters are placed using landmark guidance (blind technique). This procedure has a reasonably infrequent incident of complications: pneumothorax, hemotorax, hydrothorax, arterial punctures, nerves damage, malposition, located infection, and catheter-related bloodstream infection. These complications have demonstrated in the literature to exceed 15% (1). In literature, there are many studies that compare the safety and efficacy of ultrasound guidance vs. blind technique (2). All this studies have demonstrated that the overall success of internal jugular vein cannulation for paediatric surgery is significantly improved with use of ultrasound guidance. Another frequent site often preferred for central venous catheterization is the subclavian vein. Blind technique cannulation is frequently associated with Pinch-off Syndrome, consisting in the fact that the catheter is damaged by mechanical compression between the clavicle and the first rib. Recent international literature have demonstrated that central venous access devices placed through a percutaneous subclavian approach may be compressed by neigh boring bony structures, leading to biomaterial fatigue subsequent to repeated mechanical compression, catheter fracture at the compression site, and possible embolisation of the distal fragment into the central veins (1). The percutaneous supraclavicular puncture prevents mechanical compression between the clavicle and the first rib but not pneumothorax formation. The percutaneous internal vein technique may prevent the pinch-off syndrome rather than the percutaneous supraclavicular technique but evidence-based medicine shows that Ultrasound cannulation vein is the golden goal (1, 3). In fact, the problem can be avoided using the ultrasound cannulation of the axillary vein: in this way we directly can observe that axillary vein is anterior to clavicle and we can do venipuncture with precision and safety; so, we can reduce the number of venipuncture attempts and avoid the pinch-off syndrome. Conclusion: we can assert that, today, echoguided central venous cannulation is the golden goal. Ultrasound guidance offers a new possibility for central venous catheterization in infants and children, provide good quality needle guidance and allows to check the vessel patency before puncture. Ultrasound guidance increase success rate and prevent the development of complications and venipuncture is more safety. Two-dimentional ultrasonography is more successful than Doppler guidance.

References:

1. Meola S. The use of ultrasound guidance to avoid the pinch-off syndrome. *Paediatr Anaesth.* 2005, 19: 623-650 (in press)
2. Leyvi G, Taylor DG, Teith E, Wasnick JD. Utility of ultrasound-guided venous cannulation in pediatric surgical patients: a clinical series. *Paediatr Anaesth.* 2005 NOV; 15(11): 953-8.
3. Pittiruti M, Cina A, Cotroneo A et al. Percutaneous intravascular retrieval of embolised fragment of long-term central venous catheters. *J. Vasc Access* 2000; 1: 23-27.

INTERVIEW WITH NEW MOTHERS OF PAEDIATRIC AGE GROUP

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Introduction. In England, as per the recent data published by Office for National Statistics¹, the incidence of pregnancy in females aged 13-15 years was 8.3 per 1000 in 2007 with the legal termination rate of 62%. We interviewed 7 girls between 13 and 15 years of age from October 2008 to April 2009 in their post-natal period, regarding their understanding of childbirth and involvement of anaesthetist in the process.

Methods. 7 girls with normal IQ and conversational capacity were systematically interviewed by us before their discharge from the hospital following childbirth. The conversation was witnessed by an independent observer. Informed written consent was obtained for participation in this interview from these girls and their guardians where required.

Results. None of the 7 girls had attended the antenatal anaesthetic clinic. None of them understood the meaning of the anaesthesia as a profession and none of them were aware of the possibility of involvement of an anaesthetist in labour. All 7 girls came in contact with the anaesthetists for the first time in the second stage of labour. Only one girl had heard about epidural via internet but was not sure if she can actually have one. 4 girls out of 7 had epidural analgesia during the second stage of labour but none of them remembered the potential risks of epidural explained to them at the time, during the interview. The remaining 3 girls refused epidural when offered because they failed to completely understand it when explained to them during labour. 5 out of 7 did not have clear concept about the labour itself and had grossly underestimated the intensity of labour pain. They all found it difficult to discuss analgesia with the anaesthetist while in labour. One had urgent caesarean section under epidural top-up for failure to progress. 6 girls out of 7 did not anticipate the need for anaesthesia for operative delivery and 4 out of 7 could not explain the term 'caesarean section' or 'delivery by operation/instrumentation'.

Conclusions. There did not seem to be adequate anaesthetic input in the antenatal period for these very young pregnant girls. Majority of the girls did not completely understand the process of childbirth including options for pain relief and involvement of anaesthetist at various stages in labour. There were no debriefing sessions to prepare them for labour in view of their very young age and related potential complications from anaesthetic point of view.

Reference:

1. UK National Statistics website: <http://www.statistics.gov.uk/hub/health-social-care>

PLASMA ENDOTHELIN-1 LEVELS IN PRETERM NEWBORNS WITH SEVERE PNEUMONIA.

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Objective. Increased pulmonary vascular resistance in preterm newborn infants with severe pneumonia is suggested, and endothelin-1 plays an important role in pulmonary vascular reactivity in newborns.

Methods. We determined plasma (second sample) levels of endothelin-1 in 12 preterm newborns with pneumonia and 12 without acute pneumonia (gestational ages: $28,3 \pm 1,3$ and $27,4 \pm 1,2$ weeks, respectively). Blood and a second blood sample taken 18 to 40 h after birth were used for endothelin-1 determination by enzyme immunoassay.

Results. Plasma levels ET-1 concentrations were higher than second sample ET-1 levels in both groups ($P < 0.001$). There was a significant positive correlation between second sample ET-1 and SNAPPE II ($r = 0.38$, $P = 0.02$). There were no correlations between plasma ET-1 levels first sample and second sample ET-1 concentrations and 5-min Apgar score < 6 . Duration of mechanical ventilation had a significant positive correlation with second sample ET-1 ($r = 0.54$, $P = 0.02$). Plasma level ET-1 levels did not differ between control and ARF (10,4 and 10.6 pg/mL, respectively, $P = 0.92$). Second sample ET-1 levels had significantly higher ET-1 levels than controls (0.9 and 2.5 pg/mL, respectively, $P = 0.001$)

Conclusion. Our newborn infants with and without severe pneumonia had similar plasma ET-1 levels, whereas ET-1 levels were higher in severe pneumonia than in control newborns 18 to 40 h after birth. The increased vascular resistance in severe pneumonia may be related to high ET-1 levels.

INCREASED SERUM LEVELS OF INTERLEUKIN 6 ARE ASSOCIATED WITH SEVERE INTRAVENTRICULAR HAEMORRHAGE IN MECHANICAL PRETERM INFANTS.

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Background. Intraventricular haemorrhage (IVH) and periventricular leukomalacia (PVL) in premature infants presumably have many causes in mechanical ventilation newborns.. It has been proposed that inflammatory processes in the fetomaternal unit play an important role in the pathogenesis of these lesions.

Objective. To study the correlation of postpartum serum interleukin 6 (IL6) concentration as a marker of inflammation and neonatal cerebral morbidity in mechanical ventilation preterm infants < 28 weeks of gestational age.

Methods. A total of 64 mechanical ventilation preterm infants were grouped according to maximum serum IL-6 levels within 12 hours post partum: group A (n = 34), \leq 100 pg/ml; group B (n = 30), > 100 pg/ml. Ultrasound studies and clinical assessment were performed routinely.

Results: IVH was noted significantly more often in group B (22/30; 73,3%) than in group A (11/34; 32,3%) (p = 0.02). In a multiple logistic regression model, raised serum IL-6 independently predicted development of severe IVH (odds ratio 8.3; 95% confidence interval 2.82 to 24.9; p = 0.0001).

Conclusions. Raised serum IL-6 may serve as a marker for severe IVH in mechanical ventilation preterm infants < 28 weeks of gestational age. Although cerebral morbidity in mechanical ventilation preterm infants is determined by different variables, the identification of systemic inflammation can help to define the need for anti-inflammatory strategies to prevent cerebral morbidity.

NEONATAL CHEST COMPRESSION AND VENTILATION SKILLS BY NURSES

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Background and Aim: Mortality and Morbidity rate in neonate is very important. Asphyxia is one of the most important problems during the neonatal period. The optimal ventilation and chest compression can prevent neonatal mortality. This study examined practical skills of NICU and operating room personnels in ventilation and chest compression on neonates and also the available instruments were evaluated.

Material and methods: Fifty six of staff candidates were tested. We also evaluated each candidate during performance of two rescuers CPR on a neonate manikin, using a checklist.

Results: Findings show that 32% of the candidates under study worked in the neonates unit, 25% in NICU and 43% in the operation room. Availability of the main equipment related to ventilation and cardiac massage was moderate but accessible. Also, 44.6% of them had good capability, performing for ventilation in neonate with Ambu bag, and 50% of them had good capability of cardiac massage. The evaluation was conducted using check list by two examiners.

Conclusion: In spite of good skill, 50% of the staffs were weak or moderate in giving cardiac massage and ventilation. For many of the staff conducting classes on neonate's rehabilitation and process of ventilation and cardiac massage is necessary.

A TALE OF TWO CATHETERS- 'WHERE ART THOU?' AND 'THOU ART HERE?'

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Introduction. Retained catheters can cause life-threatening complications. Retained central line catheters may cause superior vena cava syndrome while retained intrathecal or epidural catheters may result in spinal cord compression. Attempted removal may be risky and the optimal management remains individualised.

Case report 1. A 5 month old term infant underwent laminectomy and detethering of cord in May 2006 for lipoma of the conus medullaris and tethered cord. Her postoperative course was complicated by wound infection and episodes of cerebrospinal fluid (CSF) leak for which lumbar intrathecal epidural catheters were inserted. The Gauge 18 Portex epidural catheter (clear blend of polyether block amide) was inadvertently cut during attempted removal in a struggling child and the proximal portion retained. The catheter could not be localized using spine radiographs, computed axial tomography or open exploration to the dural layer. Magnetic resonance imaging revealed the catheter in vitro in a still water bath but was unsuccessful in vivo due to image degradation by arterial pulsation artefacts. To date, 3 years later, the child is asymptomatic despite the retained catheter.

Case report 2. A 14 month old 10.5 kg patient was seen for persistent fever of 2 months duration. She had a central line inserted for venous access during her previous admission overseas. She was subsequently discharged but readmitted twice for relapsing fever. Echocardiogram revealed a retained catheter in the inferior vena cava and right atrium and a successful retrieval was done under fluoroscopic guidance. In retrospect, a previous radiological report had queried the presence of a tubular structure along the right thoracic spine and over the right heart shadow and its clinical correlation to an external structure.

Discussion. Breakage of epidural catheters can result from stretching or shearing forces applied to the catheter during insertion. The catheter trapped by tough spinous ligaments and vertebral arches. Conservative management of a retained epidural catheter has been advocated unless there is a potential tract of infection or if the patient develops pain. We attempted removal as we were worried about the sequelae of an intrathecal foreign body in a young child, such as the retained intrathecal fragment serving as a conduit for CSF leakage. The Portex epidural catheter used commonly for epidurals is not radio-opaque and this hindered our attempts at catheter location.

The overall risk of death or serious complications from retained central line catheter fragments can reach 71%. The longest duration of a retained central line catheter in an asymptomatic patient is 17 years. The absence of a positive history and physical signs of a retained catheter, while puzzling, is not without precedence. The second case reminds us to expect the unexpected.

Conclusion. The consideration of the use of radio-opaque intrathecal catheters in our institution has been highlighted. Inadequate sedation resulting in a struggling child has impaired the therapeutic and diagnostic management of these two patients. A high index of suspicion and effective communication between medical personnel is essential in the diagnosis of a retained foreign body.

SEDATION DURING MAGNETIC RESONANCE IMAGING (MRI) FOR CHILDREN WITH PERINATAL HYPOXIA AND NEUROLOGICAL DEFICIENCY.

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Introduction. Imaging plays an important role in the diagnosis and treatment of HII (Hypoxic-ischemic injury), helping to guide case management in the acute setting and providing valuable information about long-term prognosis. Conventional MRI, MR spectroscopy and MR tractography is essential for correct diagnosis of HII. Magnetic resonance requires sedation or anaesthesia, aiming for perfect immobility and fast recovery. Calming doses of sedatives are not sufficient for noisy MRI or long uncomfortable nuclear medicine scans. Here, sleep or deep sedation is effective, but for older children who are unfit or whose behaviour is disturbed too need anaesthesia. Many of these children have multi-system pathology and require meticulous preoperative assessment and special care during and after procedure. This is a big challenge for the anaesthetist, as (s)he is not only provide anaesthesia outside the operation theatre, but also can not be near the child during the investigation, although these children may need assisted airways and be ventilated to prevent respiratory depression. Apnoe, excitement or movement, may have to stop MRI procedure.

The purpose of the study was to evaluate the adequate thiopental dosage in children with neurological deficits and a history of perinatal hypoxia who required sedation for MRI.

Methods. In this study we assessed 20 children (13 girls and 7 boys), who were treated in neurology and psychiatry department in children hospital in Riga. They needed the MR examination in another hospital. Patients were 6 months to 11 yr. Weight were 7 to 40 kg. ASA II-III increased risk children had due to of basic disease. We had 8 children with organic CNS lesions; 7 with unclear genesis of seizures; 3 with inborn metabolic disorders; 2 newgrowth. Sedation titrated to effect with: i/v Sol. Thiopental Na 1% with or without Sol. Dormici 0.5% (or Sol. Diazepam 0.5%). Adequate sedation with patient spontaneously breathing is mandatory to stabilize the arterial blood pressure and to prevent from the patient's movements. Monitoring consisted: SpO₂, NBP, EKG, respiration.

Results. Children with perinatal hypoxia for adequate sedation need a Thiopental dose 6–25 mg/kg, which is titrated to effect. The mean dose of thiopental was 13 mg/kg, which provided adequate spontaneous ventilation and immobility. Procedure duration ranged from 10 to 35 min (mean - 20 min). All children had adequate spontaneous breathing. Respiratory depression and SpO₂ <94-95% was not observed during this study. All patients lying supine do not need artificial airway support during MRI. Any significant haemodynamic alterations or cardiac arrhythmias were not observed. Only in one case we needed to stop the MRI procedure in order to add a dose of the medication, because child began to move. Recovery time correlated with intravenous hypnotic dose. After the investigation most of the children's recovery time was 5-30 min and child was ready to transport to their hospital.

Conclusion. For children with perinatal hypoxia and neurological deficit to provide adequate and safe sedation during MRI the required dose of Thiopental was 2-3 times higher than in the corresponding age and weight of standard doses. It can be determined only by individual titration. Anesthetics standards monitoring must be used for sedation during MRI procedure.

THURSDAY 16:00 PHARMACOLOGY

CONTINUOUS REMIFENTANIL FOR POSTOPERATIVE ANALGESIA IN CHILDREN AFTER NUSS PROCEDURE.

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Background. Post-thoracotomy pain is an intense form of postoperative pain, and analgesia after thoracic surgery is important for the patients' respiratory function after the surgery. An endoscopic modification of the Nuss procedure for pectus excavatum repair in children is gaining acceptance and is believed to be associated with fewer complications and less pain. Systemic opioids, non-steroid anti-inflammatory drugs (NSAIDs), and regional analgesia, are most commonly used for management of post-thoracotomy pain, and after the endoscopic Nuss procedure. The aim of this study is to evaluate analgesia, sedation, and cardiorespiratory function in children after thoracoscopic surgery for pectus excavatum repair, using continuous remifentanil and bolus doses of paracetamol.

Methods. Ten patients were scheduled for thoracoscopic pectus excavatum surgery. Anaesthesia was induced with propofol, remifentanil and rocuronium and maintained with sevoflurane, remifentanil and rocuronium. For postoperative analgesia patients received remifentanil continuously (0,05 – 0,1 mcg/kg/min) and bolus doses of intravenous paracetamol. Pain was assessed using a visual-analogue scale (VAS). The Ramsay sedation score, arterial pressure, ventilatory frequency, and heart rate were also measured, and blood gas analysis was performed regularly during the first 48 h after surgery.

Results. During preoperative evaluation we found that three patients had mitral valve prolapse grade 2, two patient asthma, six restrictive problems with ventilation and one Sy Marfan syndrome. The intraoperative and postoperative period in all patients was stable without complications. Mean VAS pain score in the first 12 hours was 2.8 and 2.1 during the following 38 hours. Mean Ramsay sedation score in the first 12 hours was 2.6 and 2.2 during the following 38 hours. Two patients had hypertension a few hours after the operation and they did not required therapy. Gas analysis and the other parameters that we follow where in normal rangers during a whole period. All patients started enteral nutrition in first 12 hours and left the ICU after 36 hours after the operation.

Conclusions. Continuous remifentanil and paracetamol are effective for postoperative analgesia in children after thoracoscopic pectus excavatum repair. Bearing in mind the possible complications of epidural catheterization in children, the use of remifentanil is recommended.

REMIFENTANIL FOR POSTOPERATIVE ANALGESIA IN TERM AND PRETERM NEONATES.

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Introduction. Remifentanil is a unique μ -receptor agonist of a rapid onset of action and fast clearance. It's analgesic efficacy without severe cardiopulmonary depression and in particular a short duration of effect and absence of accumulation or development of active metabolites makes it useful in long-term analgesia especially in neonates with multiple organ insufficiencies. The aim of the study was retrospective analysis of sufentanil dose related analgetic effectiveness, influence on circulation and chest compliance.

Methods. Neonates, term (n=18), and preterm 28 -36 weeks of gestation (n=9) treated in neonatal intensive care unit were anesthetized for surgical procedures using remifentanil analgesia. After procedure completion neonates were transferred back to neonatal intensive care unit with the continuous remifentanil infusion reduced to half of that intraoperative. In the neonatal intensive care unit remifentanil dose was titrated according to the needs during 48 – 72 postoperative hours.

Discussion and results. Remifentanil is the only drug for which there is rather greater than reduced clearance in especially preterm neonates making it so valuable in this age group. These pharmacologic effects of great clinical importance, translating into rapid titratability without prolonged sedation. Satisfactory analgesia was achieved in all cases within the recommended dosage. There was no significant hypotension or bradycardia within this dosing regimen. There was a decrease in chest wall compliance in two cases, but easily resolved by lowered remifentanil infusion rate. No other adverse effects were observed.

PROPOFOL INFUSION SYNDROME WITH RHABDOMYOLYSIS, ECG CHANGES AND RAISED TROPONIN IN A FIFTEEN-YEAR-OLD GIRL WITH STATUS EPILEPTICUS

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Case Report. A fifteen-year-old female was admitted to our tertiary adult neurosurgical centre with a 6-day history of increasing seizure frequency. She has a history of severe epilepsy, left inferior quadrantanopia and behavioural difficulties following resection of a right-sided neuroepithelial tumour ten years previously. Seizures had been treated with the insertion of a vagal nerve stimulator and various anti-epileptic regimens, latterly clobazam, oxcarbazepine and zonisamide. On arrival, she was found to be in partial status-epilepticus. This was confirmed electroencephalographically and she was loaded with sodium valproate without significant improvement. The seizures failed to terminate and the intensive care team intubated and ventilated the patient. Despite propofol sedation, EEG showed seizure activity and propofol was increased to 400mg/hour. On day 4, the patient was in burst-suppression on EEG and propofol was discontinued. It was restarted within one hour due to increased seizure activity. Metabolic derangement became apparent that evening with a bicarbonate 17.1 and the patient developed anterolateral T-wave inversion with first degree heart block, prolonged QT interval and right axis deviation. Urine output was poor despite adequate filling and urinalysis showed blood ++. Platelet count had halved and PT and APTT were prolonged. Blood tests revealed normal U+Es, raised phosphate of 1.36, raised CK of 6352, and positive troponin of 0.48. Valproate level was raised and this was discontinued due to its known association with thrombocytopenia. Propofol was exchanged for midazolam in view of the possibility of propofol-induced rhabdomyolysis/propofol infusion syndrome. Despite stopping propofol, CK levels climbed to 8904 on day 5, with troponin I peaking at 2.88 on day 7. She did not require renal replacement therapy and urine output increased over the next few days. Seizure activity stopped on day 6 and midazolam was discontinued. ECG changes became less marked on day 8 and the patient began to respond to commands and was subsequently extubated and discharged from ITU.

Discussion. Propofol Infusion Syndrome is associated with a high mortality rate¹. Propofol infusion syndrome (PRIS) is acute refractory bradycardia causing asystole with one or more of metabolic acidosis, rhabdomyolysis, hyperlipidaemia and fatty liver. It is associated with the administration of propofol > 4mg/kg/hr and predisposing factors including young age, critical illness of CNS origin, steroid or catecholamine administration, and inadequate carbohydrate administration¹. Propofol is becoming increasingly used as an alternative to barbiturates or benzodiazepines in status epilepticus for a number of reasons such as perceived reduction in side-effects and more rapid assessment of the patient on cessation of sedation. It is not unusual for the treatment of adolescents to occur in adult intensive care units where use of propofol infusions is common practice. This case re-iterates the importance of avoidance of long-term high dose propofol in paediatric cases.

References: Kam P, Cardone D. Propofol Infusion Syndrome. *Anaesthesia* 2007, 62: 690-701

HOW SAFE IS KETAMINE FOR PEDIATRIC OPHTHALMOLOGY?

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Introduction. It is crucial to diagnose and treat ophthalmologic diseases in the Pediatric age. However, the lack of cooperation for diagnostic procedures requires the administration of adequate anaesthesia, simultaneously safe and with accurate results. We pretend to review the applications of Ketamine for pediatric ophthalmology and its current use in our institution.

Methods. We conducted a search in Pubmed (1970-2009) with the keywords anaesthesia, ophthalmology, ketamine; manual search of references present in the selected articles. Statistical analysis of the data in the anesthesiology department, from 2006 to 2008, using MS Excel.

Results. 119 children were submitted to anaesthesia for neuroophthalmologic diagnostic procedures. In 67% a dissociative anaesthesia was chosen (Ketamine 5-7mg/Kg IM). There were no major complications, the technical conditions and results were adequate.

Discussion. The present review confirms that Ketamine poses as a preferential anaesthetic for ophthalmologic procedures in the paediatric age group: it provides a short lasting sedation, analgesia and amnesia with cardiovascular stability, airway patency and autonomous ventilation, while inhibiting the oculo-cardiac reflex (2), all favourable characteristics for anaesthesia outside the operating room (1). Despite the controversy concerning ketamine and intra-ocular pressure (IOP), some studies revealed that the effects are minimal and that the IOP tends to return to pre-anaesthetic levels 8-10min after administration (2). The electrophysiologic examination of the eye includes the electroretinography and visual evoked potentials, Ketamine being indicated for both. On the contrary, both halogenates and propofol compromise the results (2). The occurrence of nystagmus does not preclude the use of Ketamine for these exams.

References. 1. Br J Ophthalmol. 2003 May; 87(5): 535-537. 2. Current Anaesthesia & Critical Care, Vol 20, Issue 1, 46-49

DOES KETAMINE REDUCE POSTOPERATIVE MORPHINE CONSUMPTION AFTER SPINE SURGERY IN CHILDREN?

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Introduction. The aim of this study was to evaluate the effect of administration of small dose of ketamine on postoperative morphine consumption after spine instrumentation in children and adolescents.

Methods. The study protocol was approved by the local committee of ethics and all parents gave written informed consent before enrolment. We conduct a randomized controlled trial including patients above 6 years old, undergoing spine instrumentation surgery. Patients with mental handicap weren't included. Children for whom surgical or anaesthetic complication occurred were excluded from the study. A standardized general anaesthesia was carried out (induction: thiopental, vecuronium and remifentanyl, maintenance with sevoflurane and remifentanyl). Patients were randomised to receive approximately thirty minutes before the end of surgery on association to paracetamol 15mg.kg^{-1} and morphine 0.15 mg.kg^{-1} , either ketamine 0.5 mg.kg^{-1} (0.1 ml.kg^{-1} of a diluted solution at 5 mg.ml^{-1}) (ketamine group=GK) or 0.1 ml.kg^{-1} of normal saline solution (placebo group=GP). In the recovery room, pain was assessed using a visual analogic scale (VAS) and morphine $50\mu\text{g.kg}^{-1}$ was administered at 5-min intervals until the patient appeared to be comfortable (defined as VAS < 30 mm). Thereafter, patient controlled analgesia (PCA) was initiated ($20\mu\text{g.kg}^{-1}$ morphine bolus; 5 min lockout time). For every patient, we noted demographic data, duration of surgery, time to extubation and the number of morphine boluses received in the recovery room. We also recorded time to first requirement for PCA, the total supplemental analgesic requirement (received boluses and rejected demands) and the incidence of behavioural disturbances during the first 24 hours. Chi-square and Students t-test were used in statistical analysis; $p < 0.05$ was considered significant.

Results. Twenty two patients were included (GK=12, GP=10). The two groups were comparable regarding demographic data and duration of surgery. Nine patients in each group required intravenous morphine titration in the recovery room ($p=0.59$).

| | GK | GP | p |
|---|-------|-------|------|
| Morphine titration (Number of Boluses) | 3±3 | 3±2 | 0.69 |
| Time to first requirement for PCA (min) | 68±41 | 69±77 | 0.97 |
| Number of PCA received boluses | 36±15 | 41±19 | 0.53 |
| Number of PCA rejected demands | 20±24 | 23±18 | 0.71 |

Time to extubation was comparable between the two groups (GK = 34 ± 20 minutes, GP = 35 ± 10 minutes, $p=0.99$). No patient developed post operative behavioural disturbances.

Discussion. Ketamine administrated at the end of surgery seems not to reduce morphine consumption after spine instrumentation in children and adolescents.

PRE-TREATMENT WITH MAGNESIUM SULFATE TO REDUCE PROPOFOL INJECTION PAIN IN CHILDREN

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Introduction. The aim of this study was to compare pre-treatment with magnesium sulfate to lidocaine on reducing propofol infusion pain in children.

Methods. Following ethics committee approval and parental informed consent, ASA I-II children, aged between 6 and 12 years, undergoing general anaesthesia were included in a prospective randomized double-blind study. One hour after EMLA cream was applied, a 22 gauge intravenous line was inserted into the dorsum of the hand. Children were then assigned to one of the two groups: they received either magnesium sulfate $0.05 \text{ mmol.kg}^{-1}$ (Group M=GM) or lidocaine 2% 1 mg.kg^{-1} (Group C=GC), diluted in 10 ml of normal saline solution (pre-treatment solution). The syringes were visually indistinguishable and the solution was administered during one minute just before induction of general anaesthesia with propofol 5 mg.kg^{-1} . No other drug was given before administration of propofol. Pain of the infusion of the pre-treatment solution and of propofol was recorded as a dichotomous variable (yes or no): Yes was scored when any one of the following pain outcomes occurred: Verbal response, motor reaction, facial action or cry. Heart rate (HR) and non invasive mean arterial pressure (MAP) were collected at baseline then 3, 5 and 10 minutes after propofol infusion. Chi-square and Students t-test were used in statistical analysis; $p < 0.05$ was considered significant.

Results:

Forty four children were included in the study (GM=GC=22). There was no difference between the groups as regards age, sex, weight and baseline values of HR and MAP. The incidence of pain on the injection of propofol was also comparable.

Expression of pain on infusion of propofol

| | Group M (N=22) | Group C (N=22) | P |
|-----------------|-------------------|-------------------|------|
| Pain | 7 | 9 | 0.53 |
| Motor response | 4 | 6 | 0.47 |
| Verbal response | 4 | 6 | 0.47 |
| Facial action | 5 | 7 | 0.50 |
| Cry | 1 | 2 | 1 |

HR and MAP were similar between the two groups 3, 5 and 10 minutes after propofol infusion. Three children, all belonging to group M expressed pain on the injection of the pre-treatment solution ($p=0.23$).

Discussion. In this study, magnesium sulphate was as effective as lidocaine in prevention of propofol infusion pain in children. However, its injection can be painful by itself.

PREDICTIVE FACTORS OF POSTOPERATIVE NAUSEA AND VOMITING IN CHILDREN

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Introduction. The aim of our study was to determine the incidence and the predisposing factors to postoperative nausea and vomiting (PONV) in children.

Methods. We conducted a descriptive study including all children scheduled for surgery. We collected demographic data, personal and familiar history of PONV, induction and maintenance agents, airway management, type and duration of surgery and postoperative analgesic agents used. We compared children who had PONV to those who did not develop such complications. Patient characteristics were compared with Student's (quantitative variables) and Chi-square (qualitative variables) tests. Multivariate logistic regression analysis was used to determine the independent predictive factors. A p value < 0.05 was considered to be statistically significant.

Results. Four hundred and thirty four patients were enrolled in the study. One hundred and forty two children had PONV (32.7%). The univariate analysis identified patient's age, personal history of PONV, tracheal intubation, orthopaedic surgery, the use of thiopental and muscle relaxants, duration of surgery and post operative use of morphine as predictive factor of PONV. Multivariate logistic regression analysis confirmed age (p=0.01), personal history of PONV (p=0,007) and duration of surgery (p<10⁻³) as independent predictive factors of PONV.

Discussion. In our study, the incidence of PONV was comparable to the literature (1). Age, personal history and long duration of surgery are the independent predictive factors of PONV.

References. 1. Rose JB, Watcha MF. Br J Anaesth. 1999;83:104-17.

THE COMPARISON OF ORAL MIDAZOLAM, DEXMEDETOMIDINE AND MELATONIN PREMEDICATION IN CHILDREN.

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Background. Preoperative anxiety is a common problem in children. Oral midazolam has been the most commonly used premedication for paediatric patient but the use of midazolam may be associated with paradoxical reactions in children. Melatonin may induce a natural sleepiness and improve sedation. Aim of the study is to compare effect of melatonin, dexmedetomidine and midazolam used for premedication in children undergoing chronic endoscopic dilatation.

Methods. In a randomized study, 100 children received either 2 ml of 0.09 NaCl (group I), $2.5 \mu\text{g kg}^{-1}$ of dexmedetomidine (group II), 0.5mg kg^{-1} midazolam (group III) or 3 mg of melatonin (group IV) 40 min before the procedure orally. The heart rate and O_2 saturation were monitored during the treatment period. The level of sedation was assessed according to the 5 point Sedation Scale. Activity, anxiety and sedation scores of the children were assessed 10, 20, 30, 40 minutes after administration of premedication agents and scores of the response to mask was recorded after anaesthesia induction.

Results. There were no significant differences among the four groups regarding to demographically. Oral melatonin, dexmedetomidine and midazolam decreased preoperative anxiety and activity scores and provided stable hemodynamic parameters compared with placebo.

Conclusion. In these doses and clinical conditions, oral melatonin was similar to that of dexmedetomidine and midazolam and that is a good alternative for dexmedetomidine and midazolam in sedation of anxious children.

PREMEDICATION DOES NOT REDUCE EMERGENCE DELIRIUM

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Background and aim. Emergence delirium (ED) also referred to as emergence agitation (EA) is a well documented phenomenon In this study it is aimed whether the ED could be reduced if antihistaminic agents which were known to have sedation effect were added to midazolam as premedication.

Materials and methods. Seventy-seven children, aged between 2-11, ASA I-II who were planned to have tonsillectomy and adenoidectomy were included in the study. They were randomly divided into two groups, in which Group M (n=50), mean age 4.7, receiving midazolam 0.5 mg/kg, p.o.20 min prior to the operation and Group MH (n=27), mean age 5.4, receiving hydroxyzine HCl 1 mg/kg added to midazolam 0.5mg/kg p.o. All of the children were induced with propofol 2-3 mg/kg i.v., perioperative analgesia were maintained with fentanyl 2-5 mcg/kg i.v., and neuromuscular blockade with rocuronium bromide 0.6mg/kg i.v. Maintenance of anaesthesia was achieved by sevoflurane 0.5-1% in O₂/N₂O 2/4 lt/min, and paracetamol 30mg/kg was applied for postoperative analgesia. Preoperative and postoperative sedation scores (1-5 point scale), the duration of anaesthesia and surgery, extubation times, Steward score and Pediatric Anesthesia Emergence Delirium (PAED) Scores (0-20) were recorded. Statistical analysis was done with t-test and p<0.05 accepted as statistically different.

Results. There was no difference also in the duration of surgeries and anaesthesia. Extubation times were not different, however, the children in Group MH had a lower Steward's score. Neither preoperative nor postoperative sedation scores were found statistically different. The PAED scales, being 9.8 in Group M and 9.7 in Group MH were not different statistically. In Group M, 17 (34%) children had PAED scores> 10 and in Group MH, 8 (29)children had PAED scores>10.

Conclusions. 1. Antihistaminic agents were used as premedicant adjunctive drugs for their sedation, antihistaminic, bronchodilator effects. 2. Although we hypothesised in this study that antihistaminics may reduce postoperative emergence delirium in children, addition of hydroxyzine did not make any difference in PAED scale.

MAINTENANCE WITH PROPOFOL INFUSION REDUCE EMERGENCE AGITATION

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Background and aim. Emergence delirium(ED) or emergence agitation (EA), is a very unpleasant acute phenomenon both for the anaesthesiologist and the family. Several methods were studied in order to reduce the incidence of EA. In our study, the two maintenance techniques of anaesthesia, TIVA with propofol infusion and inhalational anaesthesia were compared related their effect on EA.

Materials and methods. One hundred and two patients, ASA I-II, aged between 2-10 years who were planned to have adenotonsillectomies were randomly grouped as Group PF (n=52) and Group S (n=50). All of the patients received midazolam 0.5mg/kg p.o. 20 min before the operation and EMLA^R cream was applied one hour before the operation. All of them were induced with propofol 2-3 mg/kg i.v. and fentanyl 2-5 mcg/kg i.v. was applied for perioperative analgesia. Paracetamol 30mg/kg was given rectally for postoperative analgesia. Maintenance of anaesthesia in Group PF was achieved by propofol infusion starting with 20mg/kg/h and reducing the rate according to the patient needs and stopping it 5 min before the end of the surgery. Sevoflurane 0.6-1% in O₂/N₂O 2/4 lt/min was used for maintenance of anaesthesia in Group S and it was stopped at the conclusion of the surgery. The preoperative and postoperative sedation scores on a 5 point scale, the Steward's score for recovery, the durations for surgery and anaesthesia, the extubation times and the Paediatric Anaesthesia Emergence Delirium (PAED) Scores (0-20) were recorded and compared. Statistical analysis was done with t-test and p<0.05 accepted as statistically different.

Results. The mean age of the patients in Group PF was 6.3 years and 4. in Group S. The duration of anaesthesia was significantly longer in Group S (25 min vs 38 min). There was no difference between the duration of surgeries and extubation times and preoperative sedation scores. Steward's recovery score was found to be lower in Group PF and postoperative sedations scores were 2.0 vs 2.3 in Group PF and Group S respectively. The PAED scores were lower in Group PF (PAED scores 8.7/9.8 in Group PF/Group S) (p<0.05).

Conclusion. Although the patients who had received propofol and fentanyl for maintenance of anaesthesia were more sedated and recovery scores were lower postoperatively, EA was found to be significantly lower than the patients who had received sevoflurane for maintenance.

REMIFENTANIL FOR TRACHEAL INTUBATION COMBINED WITH SEVOFLURANE IN CHILDREN.

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Background. Co-administration of sevoflurane and a short- or ultra-short acting opioid has been used to facilitate tracheal intubation in patients undergoing elective surgery. This technique obviates the administration of a neuromuscular blocking drug and is advantageous in a variety of clinical situations. Remifentanil has a rapid onset of effect and has the advantage of an ultrashort duration of action. Unfortunately, no study provide information of the full dose-response relation of remifentanil for tracheal intubation during sevoflurane induction in paediatric patients. The results of our experience about the administration of remifentanil combined with sevoflurane demonstrate to provide successful intubating conditions in children.

Methods. 38 patients, aged 2-5 yrs , ASA physical status I, undergoing general anaesthesia for elective surgery were recruited. Anaesthesia was induced with sevoflurane (8%) via face mask and progressively reduced to the predetermined constant end-tidal concentration of sevoflurane (2.5%) that was maintained for at least 5 min. Then, remifentanil 1 mcg·kg⁻¹ was injected over 30 s. Ninety seconds after the end of bolus administration of remifentanil, tracheal intubation was performed with a cuffed tracheal tube. Intubating conditions were evaluated according to a scoring system described by Viby-Mogensen (1), Figure 1. Successful intubation was defined as excellent or good intubating conditions.

Results. According to the dose of 1 mcg ·kg⁻¹ of remifentanil, the incidence of successful tracheal intubation was 89.2% in our experience.

Conclusions. Our data indicated that the use of remifentanil 1 mcg·kg⁻¹ for tracheal intubation combined with sevoflurane may be useful to obtain an optimal tracheal intubation without the use of neuromuscular blocking drugs.

References. Viby-Mogensen J, Engbaek J, Eriksson LI, et al. Good clinical research practise (GCRP) in pharmacodynamic studies with neuromuscular blocking agents. *Acta Anaesthesiol Scandinavica* 1996; 40: 59–74.

Table 1. Intubating Condition Score

| Variables | Excellent | Good | Poor |
|--|-----------------|---------------------|---------------------------------|
| Laryngoscopy (Jaw relaxation) | Easy (Fully) | Fair (Not fully) | Difficult (Poor, resistance) |
| Vocal cords Position | Abducted | Intermediate | Closed |
| Movements | None | Moving | Closing |
| Reaction to intubation and/or cuff inflation | | | |
| Movement of limbs | None | Slight | Vigorous |
| Coughing | None | Diaphragm | Sustained (>10 s) |

REMIFENTANIL VS SUFENTANIL FOR ANAESTHESIA OF NEWBORN

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The aim of our study was to compare remifentanil to sufentanil in the anaesthesia of the newborn. **Methods.** After approval of ethic's committee and informed consent from the parents we conducted a prospective randomized trial. Terms newborns scheduled for elective or urgent surgery under general anaesthesia were included. Newborns were randomized to receive G_R: remifentanil 0.25µg.kg⁻¹.mn⁻¹ or G_S: sufentanil 0.3µg.kg⁻¹.h⁻¹ in association with sevoflurane at 1 MAC. The initial infusion of opioids was afterwards titrated according to hemodynamic response in a dose range of 0.05µg.kg⁻¹. Intraoperative hemodynamic parameters were recorded. The anaesthesia duration, the time to recover spontaneous breathing and the time to tracheal extubation were noted. Thirty minutes before the end of surgery, the newborns received, in group R: paracetamol (7.5 mg.kg⁻¹) and morphine (20 µg.kg⁻¹) and in group S: paracetamol (7.5 mg.kg⁻¹).

In the postoperative period, we also recorded the hemodynamic parameters, non expected events, Amiel-tison pain score, recovery score (Ramsay score) and time to the first analgesic medication requirement. We used Student's t test to compare quantitative variables and Chi-square test for qualitative variables. Differences were considered significant at $p < 0.05$.

Results. Twenty- seven newborns were included; G_R: n= 16 and G_S: n= 11. There were no significant differences in blood pressure and heart rate between the two groups during surgery. Time to recover spontaneous breathing and to tracheal extubation were similar in both groups as well as the duration of surgery (*Table I*).

In the postoperative period, there were no significant differences in the respiratory rates, SpO₂ values, hemodynamic parameters and cardiovascular events between the two groups. The quality of recovery scores and Amiel-tison pain score were similar in both groups. There was no difference in adverse events.

Table I

| | Remifentanil | Sufentanil | <i>p</i> |
|--|--------------|------------|----------|
| Intraoperative cardiovascular events | 18.7% | 18.2% | ns |
| Time to recover spontaneous breathing (min) | 31 ± 24 | 30 ± 36 | ns |
| Time to tracheal extubation (mn) | 59 ± 39 | 47 ± 38 | ns |

Conclusion. Remifentanil is comparable to sufentanil in anaesthesia of the newborn.

FRIDAY 9:00-10:30. CLINICAL PRACTICE 2**PREEMPTIVE ANALGESIA IN PEDIATRIC STRABISMUS SURGERY**

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Methods. 46 patients aged 1-17 y with ASA1 physical status, undergoing strabismus surgery in Harran University Research Hospital were included in this prospective non-randomized hospital base case-controlled study. In the first 22 patients (control group), no extra intervention was applied, they just had general anaesthesia. In the second group, after the induction of anaesthesia we performed a subTenon block with levobupivacaine (0.125 mg) and we followed haemorrhage, ecchymosis, postoperative pain and nausea.

Results. Regarding haemorrhage, postoperative ecchymosis, pain and nausea there was significant difference between two groups in favour of the pre-emptive analgesia group. Only the difference for intraoperative ecchymosis was not significant between two groups.

Conclusion. Thus we suggest that a nerve block with minimal dose of local anaesthetic after the induction of anaesthesia in strabismus surgery decreases significantly, haemorrhage, postoperative ecchymosis, nausea and pain.

THE EFFECTS OF GASTRIC DISTENTION DUE TO MASK VENTILATION ON INTRAOCULAR PRESSURE IN PEDIATRIC PATIENTS

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Background. The ocular perfusion pressure is determined by the difference between mean arterial pressure (MAP) and intra ocular pressure. The decreased perfusion may result complications in a range from subtle vision changes or total blindness in both ophthalmic and non ophthalmic surgery (1). In the previous studies it was reported that, using the eye speculum, Valsalva manoeuvre, holding breath, exercises, the prone position, acute volume loading and positive end expiratory pressure increased the intraocular pressure inadvertently. In daily paediatric anaesthesia practise, it is not uncommon gastric air accumulation due to mask ventilation. The loss of muscle tone and gastro-oesophageal junction prevents spontaneous elimination of air. To the best of our knowledge, it was not reported before that the effect of gastric air accumulation on intraocular pressure. The purpose of this study is to evaluate the effect of gastric distension due to mask ventilation on the intraocular pressure in paediatric population under general anaesthesia.

Method. After Ethics Committee approval twenty children (aged 2-7) scheduled to undergo non-elective ophthalmic surgery under general anaesthesia with intravenous induction with thiopental and atracurium. Children with a history of glaucoma or previous intraocular surgery were excluded. Systolic and diastolic blood pressures, heart rate, oxygen saturation and end-tidal CO₂ were recorded in all patients. Ventilation was performed with a face mask while the patient became unconscious and proceeded to surgery. IOP was measured in children at the three clinical endpoints; after induction, end of mask ventilation and after gastric decompression via a naso-gastric tube.

Results. Twenty children with a mean age of 6±1 yrs (range 24 months to 7 yrs) were recruited in the study. The IOP with an applied face-mask was not statistically different from that immediately after induction (respectively: 13.0±1.2 and 14.0±0.7, p>0.05). The mean IOP was 13.0±1.2 mmHg during gastric distention and 14.1±1.0 mmHg after deflation (p>0.05) (Table 1).

Conclusion: The normal range of IOP in awake children was reported to be 16.08 ± 3.08 mmHg (2). This prospective study showed that gastric distension did not cause a significant increase in IOP during mask ventilation. We recommend that the diagnostic IOP measurement may be performed without gastric decompression in children under general anaesthesia with intravenous anaesthesia.

Table 1. The mean and SD values of IOP, HR, SAP and DAP at the 3 time points

| time | IOP (mmHg) | HR (bpm) | SAP (mmHg) | DAP (mmHg) |
|-------------------|------------|----------|------------|------------|
| induction | 14.0 ± 0.7 | 110 ± 15 | 88± 4 | 48 ± 4 |
| mask ventilation | 13.0 ± 1.2 | 108 ±16# | 87 ± 2 | 47± 5# |
| gastric deflation | 14.1 ± 1.0 | 108 ±14 | 87 ± 4 | 50 ± 5# |

(#: p<0.05 compared with the previous value)

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THE PLACE OF BISPECTRAL INDEX (BIS) IN THE MONITORING OF DEPTH OF GENERAL ANAESTHESIA IN YOUNG CHILDREN.

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Background and goal of study. The benefits from usage of Bispectral Index (BIS) as a measure of depth of general anaesthesia have not been demonstrated enough in children as great as that in adults (1). Additionally a shortage data on BIS monitoring must be stated in young children, below 5 years. The aim of this study was to assess the BIS performance in children undergoing general anaesthesia, characteristic trends, correlations with clinical parameters and finally usefulness in paediatric practice.

Methods. Forty children (9 females, 31 males, ASA I-IV, age 4,17 yr) scheduled for general anaesthesia with oral tracheal intubation were randomized into the prospective study. Exclusion criteria included neurological disorder and abnormal EEG. All children were divided into two groups: Group I (GI)-with intraoperative BIS monitoring, Group II (GII)-without BIS monitoring. In the study heart rate (HR), systolic and diastolic pressure (SAP, DAP), SpO₂ were monitored in all and in Group I-BIS values (Aspect Medical System, BIS A-2000, USA). All parameters were assessed in the following intervals: T₀-before operation, T₁-induction, T₂-intubation, T₃-maintenance of anaesthesia, T₄-recovery, T₅-extubation. Statistical analysis was performed using SPSS software 11.5 and Spearman correlation for comparison of clinical and numerical data. P value below 0,05 was considered.

Results and discussion. The study showed that BIS parameter revealed the characteristic trend during general anaesthesia in children. Initially presented values of 97-98 before induction, then stabilized at the level of 40-60 in maintenance, and came back to the initials in recovery time. The average value for intubation was 42 (14-71) and appropriately for recovery (T₄) - 63 and extubation (T₅) - 85. Over 80% of patients presented BIS value at least of 60 in the moment of back of glossopharyngeal reflexes but needed value for extubation was over 80 (85%). The increase of BIS correlated very strictly with the increase of HR (P<0,05). The similar trends were observed with reference to SAP and DAP (P<0,05). The transfer of the patients from operating room to the surgical ward revealed to be earlier when comparing patients from GI and GII. The reduction of consumption of anaesthetic and analgesic drugs in the group with BIS monitoring was observed. On the basis of the study it's impossible to confirm neither the relevance nor the irrelevance of BIS as the only objective method of monitoring of the depth of general anaesthesia among very young children. However depending on the important age-related clinical differences, development of brain, unpredictable cardiovascular and respiratory response and pharmacokinetic influence of anaesthetic drugs on very young children, BIS could be useful in the assessment of depth of anaesthesia, to make easier intubation and extubation and safe transfer from operating room (2).

Conclusion. Bispectral Index (BIS) might be accepted as an objective and simple way of the general anaesthesia evaluation, and especially within the paediatric anaesthesia, where the various phases of child development often could make the proper evaluation impossible.

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THE CHILDREN'S DRAWINGS: A TOOL FOR UNDERSTANDING ANXIETY DURING THE PREOPERATIVE PERIOD.

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Background. Art is assumed to possess therapeutic benefits in health care (1). Drawings or painting are commonly used for presenting emotional situations. Since children do not have a sophisticated mental capacity to express their feelings drawings and art therapy may be very useful tools in order to understand their mind. In psychology literature this is called as projective tests. Preoperative period is one of the highest period that anxiety may be experienced. In this time, patient has faced different types of medical stressful processes such as venous cannulation, imaging methods etc. This study intend to investigate preschool children's emotional situations before medical operations.

Method. After Ethics Committee approval, thirty preschool children were involved that scheduling operation for ear nose throat and eye surgery in this study. These schools were selected in Bolu region in similar socioeconomic status. Participants were selected randomly from operation lists, with an even distribution of males and females with focus on cognitive developmental age differences. They were placed at the entrance hall with their parents and provided a twelve colour pencil boxes including six main colours. They were told to draw a human figure and the end of the process to comment their drawings. The drawings were evaluated and interpreted with the help a psychologist who has expertise in children and projective methods.

Results. Thirty children (aged 4-7 yrs, $n = 15$ boys, $n = 15$ girls) participated the study. Their physical development levels were similar in a normal percentile range. In all children at least five different colours consist three main colours were used. Fifteen children drew a picture include people. The main finding was drawing a car (in some cases more that one). When this figure was questioned fort he meaning in their mind, they expressed the aim 'to take on it and to escape'. Five children asked that 'Is there any toys in the operating theatre also?'. Half of the children drew the 'sick organ' absent or bigger.

Conclusion. It is an ongoing study focused the effects of drawing on preoperative anxiety and mood. According to the available data, preoperative period is a stressful time fort he children and drawing is a beneficial tool to express emotion. Children may be felt hospital setting as if it is 'a play room' while dealing with art. This study may be enlighten our understanding of children scheduled for medical operations and contribute the existing knowledge far better and may help children to cooperate with medical experts. Further studies are needed that using art into the hospital conditions may reveal the effects of art on the mood and healing process the reduction of negative thoughts related medical processes.

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USAGE OF INTRAOPERATIVE SCREENING OF CARTOONS TO ALLEVIATE ANXIETY AND TO IMPROVE ACCEPTABILITY OF MINOR PROCEDURES TO BE DONE UNDER LOCAL ANAESTHESIA – 2 CASE STUDIES.

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Background and goal. Frequently, patients present to our Paediatric Day Surgery Centre for very minor procedures which are normally done under local anaesthesia (LA) in adult patients. Given the lack of understanding and cooperation, many of these cases are done under general anaesthesia (GA). Given the risks that accompany general anaesthesia, we looked into the idea of screening cartoons intraoperatively to alleviate anxiety and to promote the willingness of under-going minor procedures under LA instead.

Materials and methods. A discussion was held with the parent and child over the events that are to be expected in the operating theatre. After consent by both the parent and child, eutectic mixture of local anaesthetic (EMLA[®]) cream was applied to the planned surgical area to reduce the unpleasantness of LA infiltration prior to surgery. Using a portable device capable of playing videos, a cartoon/animation of the child's choice was screened. A small dose of IV fentanyl (0.25mcg/kg) and verbal reassurance was given to further blunt the unpleasantness of LA infiltration and the child was observed closely during the operative period for any signs of distress.

Results and discussion. We randomly chose 2 minor cases that were initially scheduled under GA to assess the feasibility of intraoperative distraction with cartoons. The first child was an 8 year-old boy scheduled for excision of pyogenic granuloma on the forehead and the other was a 12 year-old girl scheduled for an excision of right inner thigh lipoma. We are glad to report that both cases were successfully performed under LA. Since the equipment was battery powered and isolated from the patient, the risk of electrical hazard is avoided. During the operative period, both the physiologic parameters (blood pressure, heart rate and pulse oximeter) and clinical observation of the children suggests that they were very relaxed throughout the operative period. Both patients reported the entire operation as a pleasant experience and would be willing to undergo small procedures in the future using the same distraction. Their respective parents were also glad to have avoided GA for their children.

Conclusion. Using intraoperative screening of cartoons as a distraction seems a viable option to reduce the rate of general anaesthesia for minor paediatric day surgery cases. While this method seems promising, larger studies are needed to delineate overall acceptability, selection criteria and success rates in avoiding general anaesthesia.

PILOT STUDY TO ASSESS THE EFFICACY OF EARLY FEEDING VIA NASOGASTRIC TUBE IN REDUCING DISTRESS AND MORPHINE REQUIREMENTS IN INFANTS AFTER CLEFT PALATE REPAIR.

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Background. Post operative pain following cleft palate repair is treated with a combination of NSAID's, paracetamol and IV morphine. Nursing staff have suggested that some infants are often distressed because of hunger. Early feeding via a naso-gastric tube after surgery may reduce distress and analgesia requirements. The aim of the study was to determine if feeding via naso-gastric tube reduces distress and morphine requirements in first 24 hours post cleft palate repair.

Methods. Infants having primary cleft palate repair were randomised to receive either regular NG feeds (Group A) or on demand oral feeds (Group B). All patients had regular paracetamol, ibuprofen and nurse controlled IV morphine prescribed. The main outcome variable was morphine consumption in first 24 hours. Secondary outcomes were number of painful episodes (FLACC score >4) and effect of feeding on FLACC score. In particular looking if feeding reduced FLACC score by at least 2 points. Ethics approval was gained.

Results. 34 patients were studied. 5 Patients were excluded. 1 had NG tube removed due to respiratory distress. NG tube became displaced in first 6 hours in a further 2 patients. 2 patients were excluded for anaesthesia protocol violation.

Data were analysed from 14 patients in Group A and 15 in Group B. Median (range) morphine requirements were 0.14 mg/kg (0.04-0.31) in Group A and 0.16 mg/kg (0.024-0.4) in Group B ($p>0.1$). Mean paracetamol requirement in Group A was 63 mg/kg and 61.3 mg/kg in Group B ($p>0.7$). Mean ibuprofen requirements were 12.4 mg/kg in group A and 13.7 mg/kg in group B ($p>0.6$).

There were in total 55 and 80 painful episodes in groups A and B respectively ($p>0.1$). Median (range) of painful episodes were 4 (0-7) in group A and 5 (0-13) in Group B. Feeding reduced FLACC scores (by >2) in 96% and 75% ($p<0.05$) of painful episodes in Groups A and B respectively.

Conclusion. Nasogastric feeding did not decrease morphine requirements post operatively. It did not prevent painful episodes but did reduce pain scores more than oral feeding.

References:

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Supported by a grant from the Association of Paediatric Anaesthetists

POSTOPERATIVE NAUSEA AND VOMITING IN CHILDREN UNDERGOING MAXILLOFACIAL SURGERY: TIVA VS ISOFLURANE ANESTHESIA.

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Introduction. Postoperative nausea and vomiting is approximately twice as frequent amongst children as adults. Prophylaxis of postoperative nausea and vomiting is important for maxillofacial surgery, because blood in the airway or in the stomach may make nausea worse. Severe PONV can result in a range of complications including wound dehiscence, dehydration, electrolyte imbalance and eventually pulmonary aspiration.

Methods. After approval from our hospital ethical committee and written informed consent by the parents 54 patients age 5-15, ASA I-II, scheduled for elective maxillofacial surgery were randomly allocated in two groups. Group P n=27 –using propofol and fentanyl, and Group I n=27- using thiopental, fentanyl and isoflurane. Prophylactic dexamethason 0.01 mg/kg was given to all patients and droperidol was used as a rescue antiemetic postoperatively. Routine monitoring included electrocardiography, noninvasive blood pressure measurement, and pulse oximetry. The incidence and severity of PONV was evaluated for 24 hours postoperatively based on scoring system: 0=no emetic symptoms, 1=nausea, 2=vomiting.

Results. There were no significant differences between the groups with respect to demographic data and duration of anesthesia. In Group P, 7 (25.9%) patients suffered from nausea (score 1) compared with 15 (55.5 %) in Group I, 2 (7.4%) patients suffered from vomiting (score 2) in group P compared with 5 (18.5%) in Group I, and 20 (74%) patients have no emetic symptoms (score 0) in Group P compared with 12 (44%) in Group I.

Conclusion. TIVA with propofol reduces the postoperative incidence of nausea and vomiting in children undergoing maxillofacial surgery, compared with isoflurane anaesthesia, and also reduces requirements of antiemetic medications.

WHAT QUESTIONS PARENTS ASK THE ANESTHESIOLOGIST DURING THE PRE-OPERATIVE VISIT

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Background and goal of the study. Anaesthesia, surgical intervention and hospitalization are distressing life events for children and their parents. With this study, through the interview, we evaluate what parents want to know about anaesthesia, their worries and expectance from anaesthesia.

Material and methods. We included 328 parents aged 26-44 year old, whose children (aged 2-14 year old) undergoing upper abdominal surgery (hernia repair, hypospadias or orchidopexy). The interviewed parents have different level of education (high, middle and low) and from different living places (town or village).

Results. 65% of parents had not any knowledge about anaesthesia and any question concerning anaesthesia. Generally they have the low or middle level of education. Forty eight% of parents have elementary knowledge about anesthesia and the frequently asked questions are followed:

Will my child feel the pain?

When will he/she will be awake?

Can my child awake during the surgery?

Will he/she have problems after anaesthesia?

Will the child be afraid?

How long does the effect of anaesthesia last?

Are there any risks involved?

How long does the surgery last?

Who is the anaesthesiologist?

What kinds of anesthetics will be used?

Conclusions. The answers given above represent a low level of knowledge of anaesthesia, risks, and other priorities in our country. Healthcare personnel, primarily anaesthesiologists, should be involved in such issues. In order for the population to be informed about the procedures engaged in anaesthesia and the role of the anaesthesiologist, it is essential to provide information in ways such as giving speeches, TV programmes, and distributing flyers.

THE ROLE OF AUDIT AS A TOOL IN IMPROVING QUALITY OF DELIVERED CARE IN PAEDIATRIC ANAESTHESIA

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Introduction. Two adverse clinical events of inadequate pain relief in children following permanent pacemaker (PPM) insertion were reported at our institution during early 2002. It became clear that provision of analgesia during the procedure was inconsistent. We aimed to improve the quality of care we delivered in paediatric anaesthesia as a department, illustrated through analgesia provision in PPM surgery. In addition we wished to confirm the vital role of audit in this, since many National bodies support its use:

- “Audit plays a vital role in the quality assurance process and in measuring performance”¹;
- “Monitoring of management of acute pain in children will also continue to be a Care Quality Commission (CQC) indicator”²;
- “Effective and safe management of acute pain requires an active programme of education in the ... management of pain, for all health professionals who care for patients with acute pain”³.

Methods. Data for all paediatric patients undergoing investigation or surgery in catheter laboratory is routinely collected and collated on a prospective basis. Database entry is undertaken by a single individual (SJ) and missing data is sought from relevant anaesthetic staff. Retrospective analysis of the data over a 6.5 year period (July 2002 – December 2008) was undertaken. Three ‘snapshot’ periods were used (July 2002 – December 2003, January 2004 – June 2005, and January 2006 – December 2008), between each of which feedback was provided to the anaesthetic department and paediatricians. Data was collected on the per-procedure analgesic provision for all patients in whom PPM surgery was undertaken. Statistical tests consisted of proportional data being arcsined and chi-squared statistics.

Results. 2580 paediatric patients underwent anaesthetic procedures during the 72 study months. Of which 148 underwent PPM procedures.

| | Period 1 number(% of cases) | Period 2 number(% of cases) | Period 3 number(% of cases) |
|---------------------------|--------------------------------|--------------------------------|--------------------------------|
| Number PPM cases | 40 | 34 | 74 |
| No analgesia provided | 10 (25%) | 6 (17%) | 4 (5%) * |
| Paracetamol +/- NSAIDs | 17 (43%) | 26 (76%) | 71 (96%) * |
| Long-acting opioids (LAO) | 14 (35%) | 15 (44%) | 44 (59%) * |
| LAO + opioid sparing | 7 (18%) | 14 (41%) | 41 (55%) * |

*(p<0.05) in comparison to period 1 (chi-squared)

Discussion and conclusion. Analgesic provision can be improved by using audit as a tool to provide feedback to anaesthetists. We have demonstrated audit is effective in both improving quality of care (in this case provision of analgesic drugs); and demonstrating that this has occurred.

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MASSIVE GASTROENTERIC BLEEDINGS IN CHILDREN: SOME ASPECTS OF INTENSIVE THERAPY

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Introduction. Massive gastroenteric bleedings are rare in paediatric surgery. However fast development of multi organ failure with dysfunction of vital systems, high probability of lethal outcome are dictated necessity of early diagnostics and adequate intensive therapy. There are some directions of medical actions at acute gastroenteric bleedings. They are stop of bleeding by conservative or surgical way; replaceable therapy of haemorrhage; prophylaxis and treatment of coagulation disorders; etiologic and pathogenetic treatment of the basic disease. We have carried out the analysis of own and literary data for optimization of intensive therapy at children with massive gastroenteric bleedings.

Methods. 28 children of 3-14 years of age with massive acute gastrointestinal bleedings were under our supervision in 2000-2008 years, including 11 patients with gastric ulcer, 8 – with duodenal ulcer, 9 – with ulcer of Meckel's diverticulum. The bleeding has been stopped by conservative way at 16 children and 12 children were operated. Clinical, laboratory and instrumental controls included monitoring of haemodynamic condition (cardiac output, arterial pressure, central venous pressure), diuresis, condition of microcirculation, regular control of haemoglobin, haematocrit, erythrocytes, thrombocytes, coagulation status, oxygen saturation.

Results. The lead analysis has revealed, that the degree of central hemodynamic dysfunction at patients with massive bleeding before treatment does not influence on disease's prognosis. It is parameter of shock's factor aggression and adaptable opportunities of organism. Replaceable therapy included solutions of crystalloids and colloids, and also donor blood preparations. Combination of 0,9 % sodium chloride solution and 5 % glucose solution in the ratio 1:2 were the optimal in crystalloids group. Derivatives of dextran, hydroxyethylstarch and gelatin were used as colloid plasma expander. We determined that derivative of gelatin "Helofusin" was optimal plasma substitute because it had not negative influence on haemostasis. The maximal daily doze (200 ml/kg) allowed used it effectively in the case of proceeding blood losses. If haemoglobin level was less than 70 g/L transfusion of donor blood were made with the replaceable purpose. An obligatory condition was the small period of its storage (till 10 day). Chilled donor plasma was used only for prevention of coagulopathy of consumption. Drugs with antiproteolytic activity was used for prophylaxis of coagulation disorders. Proton pump inhibitors were used in cases of acute upper gastrointestinal bleeding. Oxygen deficiency was eliminated by respiratory support from prolonged submission of the humidified oxygen through nasopharyngeal catheter and up to regimen CPAP.

Conclusions. The degree of central haemodynamics dysfunction at children with massive gastroenteric bleeding before treatment does not influence on disease's prognosis. It is parameter of shock's factor aggression and adaptable opportunities of organism. The intensive therapy including the rational approach to a choice of plasma expanders, blood transfusions, prophylaxis and treatment of coagulation disorders, respiratory support, has allowed to reduce duration of treatment in intensive therapy department on 1.8 day. There were not lethal outcomes.

FEAR AND PERCEPTION OF PAIN IN CHILDREN UNDERGOING DAY SURGERY

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Introduction. This study aims to explore the fears that children undergoing day surgery experience and the factors affecting their level of fear, such as preoperative preparation, prior experiences and the nature of such experiences. It also aims to see if there is any correlation between fear, anticipated and experienced pain.

Methods. After ethics committee approval, consent from parents and assent from patients, we recruited 100 children aged 7-12 years old scheduled to undergo day surgery procedures. Before surgery, we assessed factors that may affect their fear, common fears experienced, level of preoperative fear and anxiety and anticipated pain score. The induction compliance checklist is filled up during induction. Post-operatively, their pain scores are recorded upon waking up and before discharge. Categorical data was analysed using Chi square test, Mann-Whitney test, Kruskal-Wallis test and Spearman's correlation. $p < 0.05$ was considered statistically significant.

Results. The common fears that children undergoing day surgery experience are fear of pain during operation (60%), pain of injections (52%) and pain at wound after operation (42%). Awareness of the procedure they are undergoing increases their level of fear ($p=0.003$) and anxiety ($p=0.018$). Those who had no prior experiences of injections or operations are more fearful than those who had any experience ($p=0.005$). Having negative prior experiences increases their anxiety ($p=0.007$). However, there is no significant correlation between fear or anxiety and induction compliance. Specific fears of intra-operative pain and post-operative pain were associated with a higher anticipated pain score ($p=0.042$ and $p=0.008$ respectively). Patients who were more anxious also had higher anticipated pain scores ($p=0.021$). Experienced pain scores when awake, 1.37 (95% confidence interval [C.I.] 0.91-1.83) was significantly lower than anticipated pain scores, 4.35 (95% C.I. 3.76-4.94), $p=0.00$. 79% of patients thought that the procedure was not as frightening as they expected.

Conclusion. Children undergoing day surgery procedures have fears and anxieties, which are increased with awareness of the procedure they are undergoing. However, children with higher levels of fear and anxiety did not have poorer induction compliance. Most of their fears are related to pain and are associated with higher anticipated pain scores. However, the procedure is neither as painful nor as frightening as they expected. There is a need to alleviate the fears and anxieties of children undergoing day surgery.

MODERN MANAGEMENT OF THE CONGENITAL DIAPHRAGMATIC HERNIA

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Background. Congenital diaphragmatic hernia (CHD) syndrome includes defect of the diaphragm with migration of viscera to the chest cavity, hypoplasia of an affected lung and pulmonary vascular bed hypoplasia with increased muscularization of the arterioles leading to pulmonary hypertension (1). Associated mortality rate has been very high (2) (up to 30-40%), despite enormous progress in diagnostic and therapy. Improvement of postnatal care over the last years has been mainly due to wide implementation of the lung protective ventilation, but the treatment remains difficult and there is no single strategy accepted worldwide.

Methods. In this retrospective study, we analyzed results of multidisciplinary treatment of 14 infants with CDH treated at a single tertiary centre (university hospital). The unified pre- and postoperative protocol consisted of high frequency oscillation, pulmonary vasodilatation (mainly nitric oxide supplied by prostacyclin in one case) and deep opioid sedation without muscle relaxation. Surgery was performed only in cardiovascular stable infants (24 hours without pulmonary hypertensive crisis), ventilated with $FiO_2 < 0.5$ and with diuresis $> 1.5 \text{ ml kg}^{-1} \text{ h}^{-1}$.

Results. The gestational age of patients was 31-41 weeks (median 38 weeks), and body weight 1300 – 4200 g (median 3175 g). In 7 out of 14 patients CDH was diagnosed prenatally. Eleven infants survived (81.2%). One infant with right diaphragmatic hernia could not be stabilised and died on the second day of life. Surgery was usually performed after few days of life (median 4 days; range 2-15). Early (within 24 hours after birth) surgery was performed in infants who presented with no or minimal symptoms of pulmonary hypertension only. In four infants bowels were eviscerated and temporarily closed in external silo (3). and abdomen was closed 3-5 days later. The mortality rate to discharge from the hospital was 3/14 (21%): one baby died after eight days due to extreme pulmonary hypertension, one failed to wean from the ventilator and expired after 52 days. Another died at home at the age of 8 months due to multiple congenital defects.

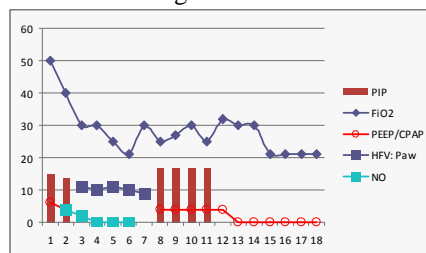


Fig.1 Time course of treatment in a typical case of CDH

Conclusions. Satisfactory results of the treatment were achieved by observing a standardised protocol and avoidance of operating on an unstable patients. The key factor of the success was the close co-operation of surgeons and intensivists. It is also worth to mention that careful and lung protective management improved clinical results and markedly reduced the need for ECMO.

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FRIDAY 11:00-12:30 REGIONAL ANAESTHESIA

SPINAL ANESTHESIA IN HURLER SYNDROME

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Introduction. Hurler's disease is a hereditary progressive disorder which have important implications for anaesthesia. Difficulties in performing regional anaesthesia have also been reported in Hurler's disease. A child with mucopolisaccharidoses Type I who had undergone right inguinal hernia repair under spinal anaesthesia is reported.

Materials and methods. An eighteen months-old girl weighing 12 kg was planned to have inguinal hernia repair. She had a reactive airway and had several upper respiratory infections, and had to be hospitalized because of frequent infections. Corneal opacity, thick lips, macroglossia, short, thick neck, hepatosplenomegaly were noted during physical assessment. She was brought to the operation room without premedication because of possible airway problems. Difficult airway had been anticipated and preparations had been made relating to this difficulty. Standard monitoring, including ECG, non-invasive blood pressure and SpO₂ was applied. Following alfentanil i.v. 10 mcg/kg, propofol i.v. 1.5 mg/kg were given very slowly in order to maintain spontaneous ventilation. Her ventilation was successfully assisted with face mask no:3. Laryngeal mask airway no:2 was successfully placed at first attempt. When the ventilation was secured, she was turned on her left lateral position. Spinal anaesthesia was performed through L4-5 intervertebral space with a spinal needle of 25G. When free flow of CSF was seen, 1 ml of bupivacaine %0.5 was given. She was placed supine and the surgery was started. Maintenance of anaesthesia was achieved by sevoflurane %0.5 in O₂ %50 N₂O %50. Neuromuscular blockers were not used throughout the operation. The duration of the surgery was 30 min, and at the conclusion of the surgery, when spontaneous ventilation of the patient was sufficient, the laryngeal mask airway was removed without any problems. No other complications were noted after the surgery and anaesthesia.

Conclusion. Hurler syndrome, an autosomal recessive disease, is important for anaesthesia since the patient had serious airway problems, skeletal deformities, big protruding tongue, short stiff neck and statue, atlanto-oxipital anomalies, hepatosplenomegaly, mental retardation, hydrocephalus, corneal opacity, hearing defects, cardiac anomalies, systemic and pulmonary hypertension, obstructive and restrictive respiratory problems. Both airway problems and vertebral anomalies may accompany. General anaesthesia with minimal airway interference and regional anaesthesia if performed without difficulty is the best and safest way of anaesthetic management.

POSTOPERATIVE ANALGESIA WITH CAUDAL EPIDURAL BLOCKS DURING THE SURGICAL TREATMENT FOR HYDRONEPHROSIS IN CHILDREN.

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Background and goal of study. Single-shot caudal epidural blockade is one of the most widespread techniques to provide intra and postoperative analgesia in paediatric patients. The aim of this study is to evaluate the duration of postoperative analgesia after caudal blocks with different concentrations of bupivacaine during the surgical treatment for hydronephrosis in children.

Material and methods. After local ethical committee approval and written parental consent, 104 children (ASA I-II, 1-9 years old), undergoing surgical treatment for hydronephrosis were enrolled in study. Induction of general anaesthesia is performed using oxygen, N₂O, sevoflurane, without using opioids in both groups. The airway was secured by tracheal intubations. After identifying the sacral hiatus, the caudal space is entered using a short (1-inch), 20-gauge short-bevel needle that has been attached to a labelled syringe containing the solution of 0.125% bupivacaine in volume 1ml/kg (group I, n=47) and 0.20% bupivacaine, 1ml/kg (group II, n=37). The needle was placed in the midline and inserted at a 45-60 degree angle to the coronal plane, perpendicular to all other planes and maintaining a rostral direction and prepared solution was injected. Continual monitoring of vital signs, observational paediatric pain score (OPS), modified Bromage scale and postoperative sedation were assessed.

Results and discussion. Patients characteristics were similar, as well as surgical time. Analgesics were needed after 602±375 min in the first group (lower concentration) and 917±577 min (higher concentration) in the second group (p< 0.05). Motor block was less in the first group (p< 0.05). Emergency agitation was present only in five children, in both groups.

Conclusions. In children undergoing surgical treatment for hydronephrosis caudal block with 0.125% bupivacaine in volume 1ml/kg produced shorter analgesic effect, but without motor block, muscle weakness and the other side effects.

DISPLACEMENT OF AN THORACIC PERIDURAL CATHETER.

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Background. In order to reduce the adverse effects of general anaesthesia, thoracic epidural anaesthesia (TEA) has been recently used in connection with thoracic surgical procedures. Advantages and risks of the peridural technique are well known. Our hospital is a centre of funnel chest corrections with a large experience with more than 600 thoracic peridural catheters placed in the majority of our patients.

Case report. We report a case of failed epidural puncture to insert a thoracic peridural catheter for pain therapy under chest wall correction by NUSS procedure in a 16-year-old boy.

The puncture for the placement of the catheter was performed in the midline of the spine while laying the patient on his left side. The needle was advanced 8 cm until the loss-of-resistance-phenomenon was evident, and the epidural catheter was easily inserted. After a negative aspiration test for cerebrospinal fluid and blood the administration of suprarenin showed no ECG-changes. During the injection of 3 ml of local anaesthetic (ropivacaine 0,75%) no side effects were registered. 10 minutes later the patient confirmed a symmetric analgetic spread between TH 4 to 10. At this time we started with a general anaesthesia for the NUSS procedure.

After insertion of the endoscopic camera we were able to see the epidural catheter about 12 cm inside the thoracic cavity. The catheter was immediately removed and the operation was continued in general anaesthesia. The patient had no side effects after the removal and was treated with an intravenous pain medication pump after the operation.

Conclusion. This case report illustrates the potential hazard of the blind epidural puncture.

CAUDAL BLOCK AND LIGHT SEVOFLURANE MASK ANESTHESIA IN HIGH-RISK INFANTS: AN AUDIT OF 98 CASES.

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Introduction. To lessen the risk of postoperative apnoea, spinal anaesthesia or caudal blockade without any sedation is currently recommended for inguinal hernia repair in neonates and ex-premature infants whose postconceptual age (pca) is less than 60 weeks. However, spinal anaesthesia is not always successful, is often too short-lasting and sedation is sometimes needed to calm down intraoperative restlessness. Moreover, it is possible that undergoing awake surgery induces some psychological stress in the infant. We therefore decided to combine light mask anesthesia (to produce unconsciousness but preserve the infant's respiratory drive) with a caudal block : this analysis of prospectively collected data evaluates the feasibility of the technique in 98 consecutive patients.

Methods. All parents gave their consent for the technique. The infant received no premedication. Anaesthesia was induced via a Mapleson D circuit with sevoflurane (S) (max 4-5% inspired concentration) in a mixture of O₂ in air. A peripheral line (glucose 2.5% in Hartmann solution) was inserted and the caudal block was performed in the left lateral position with 1mL/kg bupivacaine 0.25%, ropivacaine 0.2% or levobupivacaine 0.25% with epinephrine 5µg/mL. The inspired concentration of S was then decreased down to 1.5-2%. Care was taken to provide some CPAP and to preserve spontaneous ventilation : in case of apnea, ventilation was gently assisted until spontaneous ventilation resumed. Epidemiological and technical data regarding intraoperative care and the first 24h after surgery were prospectively collected. Because of the observational design of the study, only epidemiological statistics are provided.

Results. Among the 98 patients, 62 were born preterm: among them, 55% weighed less than 1.5kg at birth, and 50% had a history of apnoea and bradycardia. Only 5/98 patients were aged more than 60 weeks pca at the time of surgery. The caudal puncture was successful at 1st attempt in 69% of preterm and 69% of term infants ; 3 attempts were needed in 2% of preterm and 8% of term infants. There was one failure because of fusion of the sacral vertebral bodies. A systemic reaction to the injection of a test dose was observed only in preterm :3/62 (5%). There was no dural tap. Intraoperative apnoea was observed in 5/62 preterm cases (8%) : all presented with many preoperative risk factors for it and were easily managed with gentle mask ventilation. No case of postoperative bradypnoea or apnoea was observed.

Discussion. The proposed technique is a safe and effective alternative to awake spinal or caudal block: it has the same perioperative morbidity and a low risk of inducing postoperative apnoea.

THE FEASIBILITY OF SPINAL ANESTHESIA FOR OPEN PYLOROMYOTOMY IN INFANTS.

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Introduction. Spinal anaesthesia (SA) is a safe and effective alternative to general anaesthesia (GA) for appropriate surgery in newborns and infants in experienced hands. This technique has an infrequent incidence of complications, high degree of cardiorespiratory stability and provides the means for avoiding airway instrumentation. Although the popularity of SA has increased recently, its use is mainly limited to subumbilical operations. Few studies proposed SA in infants scheduled for open pyloromyotomy due to Hypertrophic Pyloric Stenosis (HPS); however the overall number of patients is still small.

The aim of present study was to assess safety and efficacy of SA in infants undergoing open pyloromyotomy for HPS at a tertiary paediatric medical centre.

Methods. The files of 39 patients who underwent open pyloromyotomy under SA over the last 4 years were analyzed retrospectively. All spinal punctures were performed by attending paediatric anaesthesiologists using 0.5% plain bupivacaine. Surgery was performed by attending paediatric surgeon or residents in paediatric surgery. The surgical technique used was right upper quadrant transverse incision. Demographic data, prematurity history, co-morbidity, technical data, cardiovascular stability, complications and supplementary drugs were checked. The surgeon assessed his or her satisfaction with SA (anaesthesia quality grade), using an in-house scale, from zero (very poor) to 10 (excellent) at the end of the surgery. For normalization of fluid and electrolyte levels, all infants received 5% glucose in Sodium chloride 0.9% -120ml/kg/day. Potassium chloride 2mEq/kg/day was added for correction of serum electrolytes after urine output was established. Well hydrated infant with a normal skin turgor and moist mucus membranes, normal urine output and laboratory parameters revealing a normal serum electrolyte count (i.e. serum bicarbonate below 27 mmol/l and serum chloride above 100 mmol/l) was considered ready for surgery. Findings are presented as means and standard deviations (SD) or as percents (%).

Results. The files of 39 patients were included in the study. Thirty five patients underwent open pyloromyotomy and 4 patients underwent combined procedures (open pyloromyotomy and circumcision or inguinal hernia repairs). The lumbar interspace of puncture was L3-L4 in 19 (49%), L4-L5 in 14 (38%) and L2-L3 in 6 (13%) of cases. In the majority of infants (75%) SA was performed with a 25G neonatal spinal needle. The mean values were: gestational age 39.15 ± 1.42 weeks (range 34-42), birth weight 3123.78 ± 492.1 g (range 2220-4400), postconceptual age 43.47 ± 2.39 (range 39-51), current weight 3644.5 ± 689.85 g (range 2650-5450). Three children (7.7%) were prematurely born. Mean dose of bupivacaine was 0.79 ± 0.12 mg/kg. Appropriate SA was accomplished in 100% (in 82.1% - from the first attempt). The maximal number of attempts was 2. Intraoperative IV sedation, usually with midazolam 0.1-0.2mg/kg was required in 15 (40%) of patients. Bradycardia less than 100 bpm without desaturation occurred in 1 patient (1.7%), who was successfully treated with IV atropine. Hypotension, high SA or apnoeas were not documented. Intraoperative conversions to GA were not performed in any case. The mean grade of anaesthesia quality was 9.53.

Conclusion. SA is a feasible, safe and effective method of anaesthesia in infants undergoing open pyloromyotomy for HPS.

COULD ROPIVACAINE REPLACE BUPIVACAINE IN PARA-UMBILICAL BLOCK IN CHILDREN?

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Background. The para-umbilical block (PUB) is an old block, which profited from a renewed interest for the umbilical surgery in childhood (*Paediatr Anaesth.* 1997; 7: 211–214). Ropivacaine is a local anaesthetic characterized by a less toxicity than bupivacaine but no study has used it for this type of block. We propose to compare ropivacaine 0.2% to Bupivacaine 0.25% in terms of post operative analgesia in children undergoing umbilical hernia repair under general anaesthesia associated with a PUB.

Patients and methods. After approval of ethic committee and informed parent's consent, we conduct a prospective, randomized, double blinded study including children, aged from 1 to 9 years, ASA Physical status I or II, scheduled for umbilical hernia repair. General anaesthesia was induced by halothane in all cases. A PUB was realized, by double puncture with injection of a volume of 0.2 ml.kg^{-1} per side. Children were randomised into two groups, to receive; G1: Ropivacaine 0.2% and G2: Bupivacaine 0.25%. Patient was excluded in case of failure of the PUB. We recorded: CHEOP'S pain scale at 1st, 2nd, 4th and 6th hours after surgery and the time of first analgesic request (Paracetamol 15mg.Kg^{-1} was administrated if CHEOPS's scale ≥ 7). Operative conditions (abdominal muscle relaxation, cutaneous infiltration) were appreciated by the surgeon. The number of patients requested in each group was statistically determined. t-student and chi-square tests were used to compare percentages and averages. The threshold of significance was fixed at 5%.

Results. Seventy four patients were included (G1=37, G2=37). There was no difference between groups as regards demographic data. CHEOPS pain scale was comparable between groups in different post operative times (figure 1).

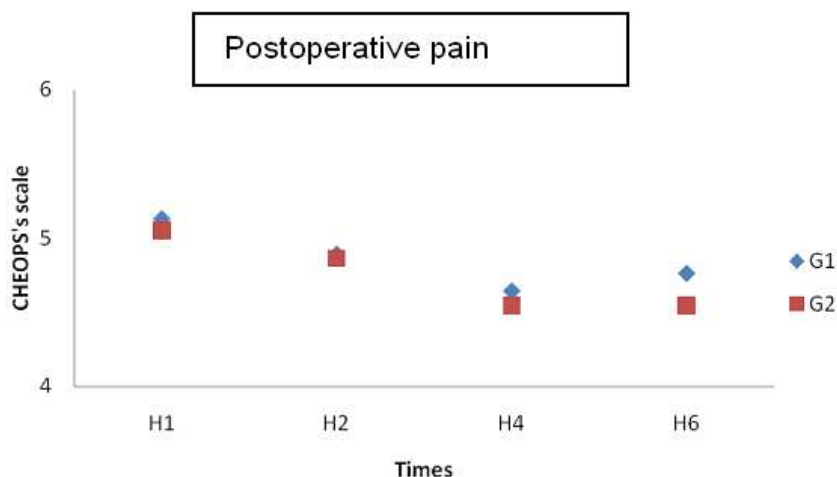


Figure1: CHEOPS pain scale in the two groups

Time of the first analgesic request and evaluation of operative conditions were comparable in the two groups.

Conclusion. Post operative analgesia provided by PUB was comparable between ropivacaine 0.2% and bupivacaine 0.25% in children undergoing umbilical hernia repair.

CLONIDINE IN PENILE BLOCK FOR FORESKIN'S AVERAGE LENGTH SURGERY IN CHILDREN.

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Background. The aim of the study was to evaluate the effect of clonidine added to bupivacaine in penile block for foreskin's average length surgery in children.

Material and methods. The study protocol was approved by the local committee of ethics and all parents gave written informed consent before enrolment. We performed a prospective randomized; double-blind trial including children aged from 1 to 6 years, ASA I –II, scheduled for hypospadias surgery or urethral fistula repair. General anaesthesia was standardized (sevoflurane inhalation induction, maintenance with isoflurane 1 MAC). Patients were then randomly assigned to have a penile block using either bupivacaine 0.5% (0.2ml.kg^{-1}) plus clonidine ($1\mu\text{g.kg}^{-1} = 0.1\text{ml.kg}^{-1}$) (G_1)- bupivacaine 0.5% (0.2ml.kg^{-1}) + normal saline solution (0.1ml.kg^{-1}) (G_2).

Postoperative analgesia was assessed using CHEOPS score on the 1st (H_1), 2nd (H_2), 3rd (H_3), 4th (H_4), 8th (H_8), 12th (H_{12}) and 24th (H_{24}) postoperative hours. If CHEOPS ≥ 7 , the child received paracetamol 15 mg.kg^{-1} and if insufficient, nalbuphine 0.2 mg.kg^{-1} by intravenous route. The number of patient requiring analgesia adjunction and the time to first requirement were recorded. Chi-square and Students t-test were used in statistical analysis; $p < 0.05$ was considered significant.

Results. Fifty-four children were included in the survey ($G_1=27$, $G_2=27$). There was no difference between the two groups as regard demographic data, type and duration of surgery. The number of children required supplementary analgesia (paracetamol) was higher in G_2 compared to G_1 (12 vs. 2 patients; $p = 0.002$) (figure 1).

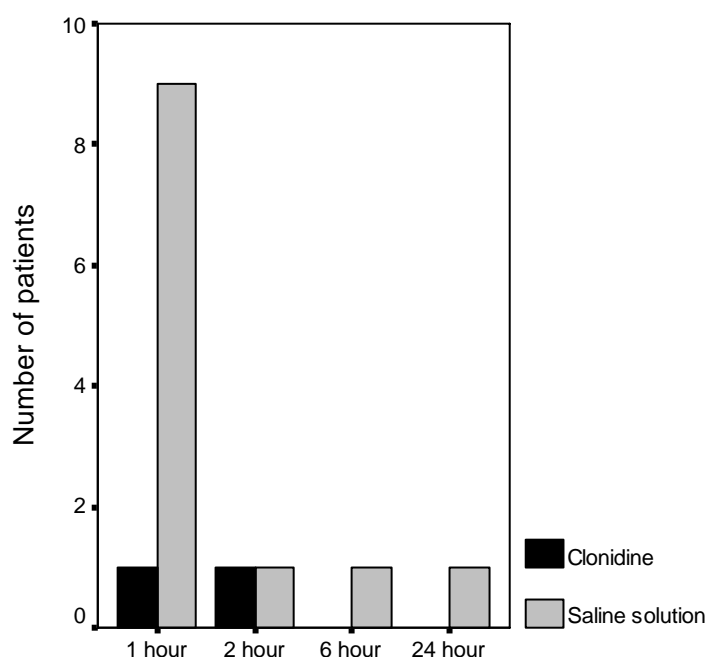


Figure 1: First time analgesia requirement

Conclusion. The addition of clonidine to bupivacaine in the penile block may improve the quality of postoperative analgesia in foreskin's average length surgery in children.

CAUDAL ANAESTHESIA IN SEDATED, SPONTANEOUSLY BREATHING PRETERM AND TERM INFANTS FOR INGUINAL HERNIA REPAIR: COMPARISON OF TWO WEIGHT GROUPS

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Background and goal of the study. Although single shot caudal anaesthesia is frequently used for inguinal hernia repair in the awake or lightly sedated preterm and low weight term infant, this technique seems not to be in regular use for older term infants. In our institution single shot caudal anaesthesia is performed under adequate sedation for herniorrhaphy in infants up to a weight of 5kg. The aim of this prospective randomised study was to evaluate the effectiveness and safety of this method comparing two weight groups.

Material and methods. All included patients were allocated in one of two groups according to their weight at the time of operation. Group A included infants with a weight up to 3500g and group B infants with a weight between 3500 – 5000g. A local anaesthetic cream (EMLA[®]) was placed over the caudal and the i.v. puncture site one hour prior to the procedure. After insertion of an i.v. line sedation was introduced and the spontaneously breathing infant was turned into the lateral decubital position. A single shot caudal block was performed using 1ml/kg ropivacaine 0,375%. Clonidine 1-2µg/kg as an adjuvant was added to the discretion of the anaesthetist. No further sedation was primarily administered during the operation. All patients were breathing spontaneously (30% oxygen in air) with an oropharyngeal airway in place. Heart rate, non invasive arterial blood pressure, pulse oximetry (SaO₂) and end-tidal CO₂ using a special nasal probe, were monitored throughout the procedure. Adverse effects, pain reactions, the need to administer additional drugs or a change of method were noted.

Results and discussion. Forty-seven infants scheduled for unilateral or bilateral inguinal hernia repair were included. Group A consisted of 20 and group B of 27 patients (details see table 1).

| n = 47 | Group A (n = 20) | Group B (n = 27) |
|--|---------------------------------|-----------------------------|
| median age (not corrected for preterm infants) | 52,5 days (range: 7 – 113 days) | 48 days (range: 25 – 96) |
| median birth weight | 1860g (range: 660 – 3250g) | 3070g (range: 1860 – 3590g) |
| median weight at time of operation | 2530g (2016g – 3500g) | 4400g (range: 3690 – 4980) |

In group A one infant (5%) needed intubation due to respiratory distress. Two intubations (7,4%) were performed in group B due to a slow onset of the block in one and severe dyspnoea in another patient. A total of 44 operations (19 in group A, 25 in group B) were performed successfully in single shot caudal anaesthesia in the spontaneously breathing patient. Additional intraoperative sedation and/or analgesia due to movements or pain reactions were needed in 5 infants (26,3%) in Group A and in 9 patients (36%) in Group B. No further adverse effects were noted.

Conclusion. According to our findings single shot caudal anaesthesia combined with light sedation is a save and effective method for inguinal hernia repair both in preterm and term infants up to a weight of 5 kg. Whether the more frequent need of intraoperative sedation due to movements in Group B indicates the limits of this method in patients with a weight close to 5 kg needs further investigation.

CIRCUMCISION WITH CAUDAL AND PENILE BLOCK IN AWAKE NEONATES.

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Introduction. Caudal block (CB) is frequently used combined with general anaesthesia for postoperative analgesia in children undergoing infraumbilical procedures (1). CB in awake neonates is the method of providing intraoperative anaesthesia and postoperative analgesia in neonates undergoing circumcision at our clinic and penile block (PB) is the other option for the parents not consenting caudal block. This study was planned retrospectively to evaluate the effectiveness of both methods to provide intra- and postoperative analgesia for awake neonatal circumcision.

Methods. The data of 102 neonates undergoing circumcision with awake CB or PB in our hospital were examined retrospectively. Demographic data, pain score, operating time, block onset time, failed blocks and complications were recorded. As soon as successful block has been achieved, neonates were comforted with a pacifier dredged in warm water saturated with sugar and wrapped up tightly by a warm blanket on the operating table. Gomcobell technique was used for circumcision. Pain was assessed by CHIPPS and recorded with 1 hour intervals postoperatively.

Results. Demographic and operative data of PB (n=20) and CB (n=82) groups were identical. CB was performed by administering 1 mL.kg⁻¹ of bupivacaine 0.25% in 53 patients and by 1 mL.kg⁻¹ of L-bupivacaine 0.25% in 29 patients. PB was performed by applying 1 mL.kg⁻¹ of bupivacaine 0.25% in 20 patients. Mean PB onset time (7 ± 2 min; range 6-10) was shorter than CB onset time (11 ± 3 min; range 6-18; p<0,05). Four (6,4 %) patients had CB and 4 (20%) patients had PB failure that was significantly different. Penile block was repeated with 2.5 mg.kg⁻¹ of 1% lidocaine for those failed cases. Mean pain scores were similar in patients with PB and CB for the first 3 hours. Mean pain score was significantly lower at postoperative 4th hour in the patients having CB (Table 1). No complications were recorded.

Conclusion. Caudal anaesthesia is an effective way of performing awake neonatal circumcision. It provides a higher success rate and prolonged postoperative analgesia compared to PB.

References: Tsui BCH, Berde CB. Caudal analgesia and anaesthesia techniques in children. Curr Opin Anaesthesiol 2005; 18: 283-288.

Table 1. Mean pain scores of the patients receiving CB and PB (* p<0.05).

| Postoperative hour | CB (n=82) | PB (n=20) |
|--------------------|------------|-----------|
| 0 | 1 ± 0,2 | 2 ± 0,3 |
| 1 | 0,8 ± 0,2 | 1,5 ± 0,5 |
| 2 | 0,7 ± 0,2 | 1,6 ± 0,4 |
| 3 | 1 ± 0,4 | 2 ± 0,4 |
| 4 | *1,5 ± 0,5 | 4 ± 1,2 |
| 5 | 2,5 ± 0,6 | 3 ± 0,8 |
| 6 | 2 ± 0,8 | 1,8 ± 0,4 |

EFFECTS OF LEVOBUPIVACAINE INFILTRATION, CAUDAL BLOCK AND RECTAL PARACETAMOL ON POSTOPERATIVE ANALGESIA IN CHILDREN FOLLOWING INGUINAL HERNIA REPAIR.

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Aim. The aim of this study is to compare the postoperative analgesic effects of the caudal block, postincisional wound infiltration with levobupivacaine and rectal paracetamol in children following inguinal hernia repair.

Methods. The study was approved by the local ethical committee (Sisli Etfal Teaching and Research Hospital) and written informed parental consent was obtained in every case. Ninety children whose ages varied between 1-7 years undergoing unilateral inguinal hernia repair and with an ASA Physical Status I were included. The study was designed as a prospective, single-blinded, and randomized trial. Children who had bilateral or recurrent hernia and neurological, neuromuscular, psychiatric, blood clotting disorder or any drug allergy were excluded. General anaesthesia was induced with thiopentone 5 mg/kg, fentanyl 1µg/kg, rocuronium 0,6 mg/kg. Patients intubated after induction of anaesthesia and 2-2.5% sevoflurane with 70/30% air/oxygen were used for maintenance of anaesthesia. In Group I (n=30) 0.25 ml/kg levobupivacaine in 5mg/ml were infiltrated on subcutaneous wound after closure of the external aponeurosis, but before the skin suture. In Group C (n=30) preoperative caudal block with 1mg/kg, 1ml/kg %0,5 levobupivacaine was given. In Group P (n=30) 35mg/kg paracetamol was given rectally 30 minutes before the operation. Mean arterial pressure, heart rate and saturation were recorded before and after intubation and in every ten minutes till the end of the surgery. Upon arrival in the post anaesthesia care unit (PACU), heart rate and mean arterial pressure and objective pain score (OPS) were recorded at 15-min intervals for the first 1 hour, followed by every 1 h for the next 4 hours. Parents were contacted the day after the surgery for assessment of OPS, nausea, vomiting, pruritis and number of rescue analgesics and the time of giving the first dose of paracetamol were recorded.

Results. The pain scores of the patients at baseline, 15, 30, 45, 60 min and 2, 3, and 4 h were significantly higher in group P than in group I and in group C, whereas there were no differences between group I and group C. Oral paracetamol as a rescue analgesics was required by 5 patients in group I, 3 patients in group C and 12 patients in group P in the 24 hour postoperative period. The rescue analgesic administered patients was higher in group P than in groups I and C. Average time of the first analgesia was significantly shorter in group P than both groups I and C. Whereas no difference between group I and group C was detected. There was no difference between the three groups regarding adverse effects. One child in group I and two children in group P had nausea.

Conclusion. The wound infiltration with levobupivacaine before the end of the surgery and caudal block are effective in reducing postoperative pain and rescue analgesics consumption. We conclude that wound infiltration with levobupivacaine and caudal block may be a good choice for postoperative analgesia in children having inguinal hernia repair.

FRIDAY 16:00. CASE REPORTS

SEVOFLURANE FOR FIBEROPTIC INTUBATION IN NEWBORN WITH HANHART SYNDROME

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Background. The Hanhart syndrome is a rare birth defect with the most common clinical findings being a short, incompletely developed tongue; absence or partially missing fingers and/or toes; malformed arms and/or legs; and an extremely small jaw. Induction of anaesthesia and tracheal intubation in these patients is a challenging task. We report the experience of a successful fiberoptic guided intubation using a titrated inhalation induction and a Patil face mask.

Methods. A newborn patient (2 weeks old, 4 kg weight) affected of Hanhart syndrome was scheduled for major oral surgery. After the child was brought to the OR, standard monitors were applied and a 22 G peripheral i.v. line was placed. The patient was then premedicated with 10 µg / kg of i.v. atropine. Due to a nasal malformation, the placement of a nasopharyngeal airway in one of the nostrils was impossible so oxygenation supplementation was achieved with the aid of the Patil face mask. Incremental doses of sevoflurane with pure oxygen were administered until loss of eyelid reflexes was accomplished. End-tidal Sevoflurane concentrations were monitored. After the inhalation induction, nasal lidocaine (15 mg in 2,5 cc NS) was administered to achieve anesthesia of the oro-pharynx. A neonatal fiberoptic intubating scope (Storz 2.7) was introduced into the left nostril and under direct visualization placed at the level of the glottis opening. We then inserted an epidural catheter (20G, B.Braun) through the work-channel of the scope, advancing it past the tip and beyond the vocal cords. This allowed us to administer an additional 15 mg of lidocaine into the trachea and to advance the fiberoptic scope to the level of the carina without difficulty. Using the Seldinger technique, we then intubated the trachea with a 3.5 ID cuffed endotracheal tube, re-checking for correct placement prior to the removal of the fiberoptic scope. Spontaneous ventilation was maintained throughout the entire intubating procedure.

Results. Tracheal intubation in small children with suspected or even known difficult airway must be planned and approached with the aid of a fiber scope. Sedation should be administered according to the patient's situation and the anaesthesiologist's preferences, but maintaining spontaneous breathing remains of paramount importance. We have performed a successful fiberoptic guided nasotracheal intubation in a newborn affected with Hanhart syndrome. The use of a Patil facemask allows for the introduction of the fibroscope (nasal route) through a side port while maintaining the oxygenation and the appropriate end-tidal concentration of the anaesthetic agent.

Conclusion. The combination of inhalation induction with sevoflurane and fiberoptic guided tracheal intubation seems to be a reliable and safe procedure for managing the difficult airway in small children.

CASE STUDY: ANAESTHETIC CONSIDERATIONS OF A 3.5-YEAR-OLD BOY WITH COSTELLO SYNDROME

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Background. Costello syndrome is a very rare genetic disorder, first described by Costello in 1971. This congenital abnormality is characterized by typical coarse facial features, developmental delay, psychomotor and growth retardation, neurologic abnormalities, serious cardiac anomalies, severe feeding difficulties with postnatal growth failure and increased risk of tumors (1). Characteristically patients are born with increased birth weight and macrocephaly which is followed by postnatal growth retardation and failure to thrive (2). Recently, heterozygous mutations in the HRAS gene have been identified as the cause of Costello syndrome. It is inherited in an autosomal dominant manner and almost all cases have resulted from new mutations (3).

Case report. The patient was a 3.5-year-old boy (weight 13 kg) with diagnosed Costello syndrome. The diagnosis was based on clinical findings (coarse facial features, macrocephaly, low-set ears with thick lobes, flat nasal bridge, macroglossia, short neck, short upper and lower limbs, respiratory distress immediately after birth, hypertrophic cardiomyopathy associated with supraventricular tachyarrhythmias, multiple atrial ectopic beats, ventricular septal defects) and confirmed with the HRAS mutation analysis (a mutation was found in heterozygous state in the HRAS gene; this missense mutation leading to substitution of glycine at amino acid position 12 by serine).

The boy was scheduled for a forehead abscess removal under general anaesthesia. The preoperative assessment revealed a possible difficulty in airway management due to macrocephaly, macroglossia and short neck.

Cardiac assessment (ECG, ECHO, 24h Holter, physical examination) revealed hypertrophic cardiomyopathy, mild pulmonary hypertension, supraventricular and ventricular tachyarrhythmias and multiple atrial ectopic beats. The patient was under medication with propranolol hydrochloride. Abdominal screening was normal.

Preoperatively the patient was held NPO about ten hours because gastroesophageal reflux is often and the risk of perioperative aspiration is high. So, intravenous administration of normal saline was applied 4 hours before surgery. Perioperative antibiotic prophylaxis was taken.

On arrival into the operating room the patient was premedicated with midazolam. Routine monitors (pulse oximetry, ECG, noninvasive blood pressure monitoring and capnography) were applied. Anaesthesia was induced with intravenous propofol (3 mg/kg) and fentanyl (2 µg/kg). Mask ventilation was performed in air/oxygen. During the whole procedure tachyarrhythmias appeared, while the rest vital signs ranged within normal limits. The operation lasted 15 minutes and the patient recovered from anaesthesia uneventfully. Preoperatively paracetamol 500mg sup. was administered for pain management.

Discussion: Costello syndrome is a very rare syndrome (200-300 cases worldwide) with multi-system involvement and wide spectrum of clinical features^(1,2). The anaesthetic management may be complicated due to difficult airway management, serious cardiac problems, and high risk of perioperative aspiration. Of primary importance are a thorough preoperative evaluation and preparation for the anaesthetic management of patients with Costello syndrome.

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ANAESTHETIC MANAGEMENT OF BALLOON VALVULOPLASTY IN A 1100G PRETERM NEWBORN WITH CRITICAL AORTIC VALVE STENOSIS

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Introduction. Hemodynamic stability is an important goal in anaesthetic management in newborns. Particularly newborns with cardiac abnormalities are at high risk of developing hemodynamic instability during anaesthesia. We report about a preterm newborn with aortic valve stenosis, who was scheduled for balloon valvuloplasty. We evaluated, whether S(+)ketamine might provide stable hemodynamic conditions in this preterm baby.

Case report. A preterm baby of a healthy mother (33 weeks of gestation, small-for-date, birth weight 1194g) developed symptoms of incipient cardiac and renal dysfunction, elevated liver enzymes and hyperbilirubinemia. A systolic murmur was diagnosed. Echocardiography revealed an aortic valve stenosis with a peak systolic gradient of 80 mm Hg, persistent ductus arteriosus (PDA) with a bidirectional shunt. Intervention was indicated and balloon valvuloplasty was performed. Because of the low birth weight the right carotid artery (RCA) was exposed by surgical cutdown. RCA was then punctured by a 20G needle and a 4 F(French) sheath was introduced . Finally the balloon dilation catheter was introduced and the aortic valve was dilated successfully.(peak systolic gradient reduced from 80 to 20 mm Hg).The baby was electively intubated and then taken to the paediatric cardiac catheterization unit. Before transferring the baby from the incubator onto the intervention table we applied 3 mg S (+) ketamine, 0,3 mg midazolam and 3 µg fentanyl . Continuous infusion of milrinon 0,5 µg/kg/min and norepinephrine 0,1 µg/kg/min was started. Anaesthesia was maintained with Sevoflurane 2% and a continuous infusion of S (+) ketamine 2 mg/kg/h. Heart rate was 120 bpm at the beginning. Mean arterial blood pressure(MAD) was at about 45 mm Hg, oxygen saturation remained at 98 %.When surgery started, arterenol infusion was raised to 0,5 µg/kg/min and 10 µg fentanyl were administered. For balancing the blood loss, fractions of 10 ml of fresh frozen plasma and erythrocyte concentrate (totally 40 ml) were infused. During the whole procedure MAD remained at 40 mm Hg continuously, heart rate was at 110 bpm , oxygen saturation at 98 %. During dilatation of the aortic valve the endexpiratory CO₂ curve disappeared for a few seconds and SpO₂ decreased to 89 %.After the balloon was deflated, CO₂ recovered and SpO₂ returned to 98%. The newborn was retransferred to the ICU in stable condition and was extubated on postoperative day one.

Discussion. Changes of blood pressure in systemic and pulmonary circulation may result in changes of shunts with consecutive insufficient perfusion, thus causing oxygen desaturation and hypoxia. S(+) ketamine increases and stabilizes blood pressure. These effects are very welcome in newborns to avoid blood pressure decrease during general anaesthesia and in this case to reduce the risk of hemodynamic instability due to the PDA and the aortic valve stenosis.

Conclusion. S(+) ketamine seems to be a reliable basis for anaesthetic management in preterm newborns with high risk of hemodynamic instability

FOREIGN BODY ASPIRATION MASKING MYASTHENIA

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Introduction. A twelve-year-old girl was admitted in the ENT Clinic for bronchoscopy for foreign body aspiration. According to the history, the girl aspirated a piece of solid food four days ago and coughed periodically since then. Chest X-ray showed right lower lobe atelectasis. During the preanesthetic visit important information arose, thanks to the anaesthesiologist's questions.

Case report. The child complained of weakness and reduced activity during the last ten months. She felt much better in summer than in school period, had difficulties studying in the evening and there were some episodes of falls without loss of consciousness. Parents reported loss of appetite and hoarseness in the last ten days. Her mood was deteriorating and felt depressed. The paediatrician was unable to solve the problem and suggested a psychiatrist's consultation. Fluoxetine was prescribed.

Auscultation revealed reduced breath sounds at the right lobe.

Due to the anaesthesiologist's suspicion that the aspiration was related to myasthenia gravis, parents were informed that a delay in "awakening" was probable after bronchoscopy.

Induction of anaesthesia was provided with propofol 3mg/kg, fentanyl 2 mcg/kg, and vecuronium in one-third of the usual dose, and a continuous infusion of remifentanyl of 0.5 mcg/kg was started. A mixture of O₂ and N₂O was administered during the procedure. Routine monitoring was used. No adverse events occurred during the procedure.

After rigid bronchoscopy, which revealed the presence of thick secretions in the right lung and lasted ten minutes, the infusion of remifentanyl stopped and a lengthy period of waiting started. Not any answer in the TOF stimulation and no clinical signs of recovery were noted even after one hour following the administration of the relaxant.

At that moment, the usual dose of neostigmine and atropine was given and, after two minutes, three answers in the TOF stimulation appeared and soon afterwards the patient opened the eyes and was extubated. In the recovery room she was stable with SpO₂ of 97-99% in FiO₂ of 30%. She felt mild weakness and was unable to cough effectively and clear secretions. She was admitted in the ICU to avoid the risk of re-intubation. After an uneventful, overnight stay there, she was admitted to a paediatric ward for confirmation of the diagnosis. edrophonium test was positive and appropriate therapy was provided.

Discussion. In juvenile myasthenia gravis disturbed neuromuscular transmission owing to antibodies against nicotinic acetylcholine receptors results in weakness with exertion. Fifty percent of prepubescent children present with respiratory symptoms or myasthenic crisis at the time of diagnosis, compared to less than 10% of adults. Most patients, like the current girl, have symptoms for several months before developing respiratory failure. It is important to realise, that neuromuscular disorder is included in the differential diagnosis of unexplained acute respiratory failure or foreign body aspiration, especially in older children.

Creating reliable communication with the parents ameliorates anxiety caused by the chronic problem of their child but also "protects" the anaesthesiologist in case his practice leads to a reversible complication that is inevitable.

ESMOLOL FOR PERIOPERATIVE BLOOD PRESSURE CONTROL IN A CHILD WITH NEUROBLASTOMA: CASE REPORT.

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Introduction. Neuroblastoma is the most common solid tumour in infancy and childhood. Despite this tumour usually produces catecholamines, it seldom leads to hemodynamic instability, that is always observed in pheochromocytoma (1). It is important to optimize the perioperative management and to treat intraoperative complications. Esmolol, showed to be a valid drug to control hemodynamic fluctuations in a patient with neuroblastoma and hypertension. To our knowledge, in literature there are not reports about the rule of this β -blocker in this particular field of application (1)(2).

Methods. We describe the case of a 6-yr-old child who underwent sternotomy for excision of a cervico-mediastinal neuroblastoma. Preoperative arterial blood pressure (BP) values ranged between 96/50 and 120/75 mmHg. 24-hr-urine catecholamine collection showed values of 24.1 mg/24h (≤ 4.5), 37.5 ug/mg /creat (≤ 10), 23.2 umol/mmol creat (≤ 6.2). Computed tomography revealed a superior left paravertebral mass between T2 and T6, and the child was scheduled for surgical excision of the neuroblastoma. Intraoperative manipulation of the tumour caused hypertension with a BP ranging between 120/90 and 139/110 mmHg, treated with repeated doses of phentolamine up to 5 mg, but complete control of BP was not obtained. For this reason, esmolol was administered with a loading dose of 50 μ g/kg, followed by continuous infusion with the dose of 100 μ g/kg/min. In few minutes we gained an hemodynamic stabilization. After excision of tumour, a progressive reduction of esmolol requirement was observed, and the infusion progressively reduced and finally stopped. Hemodynamic stability characterized the remaining perioperative time.

Results and discussion. Tumours of neural crest can produce catecholamine and the hemodynamic response is extremely variable. Moreover, preoperatively asymptomatic patients could have hypertension because of the surgical manipulation of the tumour. It is important to do always, before surgery, a diagnostic work-up to evaluate risks of intra-operative complications. Accurate monitoring of BP, hearth rate (HR) and 24-hr-urine collection for catecholamine dosage should be mandatory. α -adrenergic receptor antagonists are a suitable preoperative treatment in children with hypertension and tachycardia. Intraoperatively, phentolamine often is used as α -blocker. For its favourable pharmacokinetic (rapid onset [2 minutes]) and short half-life time [9 minutes]) and pharmacodynamic (selective β_1 receptor blocker) profile esmolol could be considered a drug of choice, in association with α - antagonist, to control hemodynamic fluctuations in intraoperative time of catecholamines secreting neuroblastoma (3). In our case report, phentolamine was used both with esmolol to obtain the complete hemodynamic control.

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CARDIAC TAMPONADE AS A RESULT OF PERIPHERALLY INSERTED CENTRAL CATHETER: A CASE REPORT.

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Introduction. Peripherally inserted central catheters (PICC) are commonly used in premature infants for parenteral nutrition or catecholamine infusion as they are generally believed to be the safest and least invasive option. However, serious complications may occur and they are difficult to recognize due to their late symptoms. Acute cardiac tamponade has been mentioned among reported life-threatening complications (1,2).

Case report. We present the case of a baby girl, in whom acute cardiac tamponade occurred 6 days after the PICC insertion. A 6-day-old girl, weighing 2100 g, born at 32 weeks of gestation, was admitted to the tertiary intensive care unit because of respiratory distress due to congenital pneumonia. A PICC was inserted from the left antecubital fossa for parenteral nutrition. Control chest X-ray was performed, but the tip of the catheter could not be visualized. The pneumonia was successfully treated, trachea was extubated on the 4th day of treatment, and the patient was placed on nCPAP. Six days after the PICC insertion the child became apnoeic, oliguric and developed tachycardia. 5% albumin solution, 20 ml/kg b.w. was infused through the central line due to suspected hypovolaemia. This resulted in cardiovascular collapse followed by cardiac arrest. Chest X-ray and echocardiography during CPR revealed cardiac tamponade, and immediate pericardiocentesis was performed. This caused a prompt return of spontaneous cardiac function. The pericardial fluid was consistent with the infusate. The child made full recovery without any signs of hypoxic brain damage.

Discussion and conclusion. The possibility of pericardial tamponade must be kept in mind during the resuscitation of any preterm infant with a PICC in place in whom sudden cardiovascular collapse occurs. This is especially important because in such situations central lines are used to administer drugs and fluid for resuscitation purposes, which may aggravate the problem. Even preterm infants can be successfully resuscitated once the heart is decompressed. Chest x-ray and echocardiography should always be considered during resuscitation in children with central lines. The CVC tip should remain outside the cardiac silhouette but still within the vena cava.

This case changed our clinical practice: a contrast medium is always used to visualize the exact position of the catheter tip.

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PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA IN NEONATE THAT SUBSIDED AFTER VOLATILE ANAESTHESIA WITH SEVOFLURANE.

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Introduction. Paroxysmal supraventricular tachycardia (SVT) can be life-threatening in infants. Most SVTs are due to re-entry mechanism and are paroxysmal, being associated with sudden onset and termination. Treatment of SVT is based on vagal manoeuvres, pharmacological therapy like adenosine or external cardioversion, depending on the degree of cardiac decompensation. Sevoflurane is indicated for the induction and maintenance of general anaesthesia in paediatric patients and has several effects on cardiovascular system. Its use causes a decrease of blood pressure, cardiac output and peripheral vascular resistance in a dose-related manner. Sevoflurane has rather little effect on heart rate or rhythm; it can cause tachycardia by a reflex increase in adrenergic tone. Sevoflurane has no effect on the electrophysiologic nature of the normal atrioventricular or accessory pathway and no clinically important effect on sinoatrial node activity [1].

Methods. We present a case report of an one-day-old newborn with prenatally diagnosed SVT, which was confirmed after birth. The patient was transported by an emergency neonatal ambulance service to university hospital for further diagnosis and treatment. Because of difficult intravenous cannulation the patient was brought to the operating theatre for central catheter insertion under general anaesthesia. Shortly after implementing general anaesthesia with inhaled sevoflurane SVT was terminated. The further hospital course showed no return of SVT.

Discussion: To our knowledge it is the first reported case of SVT termination after inhalational anaesthesia with sevoflurane. It is however difficult to determine whether it was an effect of sevoflurane itself, or ventilatory changes caused by mask induction (eg. airway pressure increase) that could mimic a Valsalva maneuver [2].

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OCTREOTIDE FOR POSTOPERATIVE CHYLOTHORAX IN INFANTS

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Background. Chylothorax is a rare complication, that in selected cases can markedly influence the survival. The prolonged chyle loss is usually manifested with serious homeostasis disturbances; no universal protocol for treatment has been described so far. Among suggested solution of the problem, somatostatine and its analogue (octreotide) have been proposed.

Objective. To report own experiences with treating of postoperative chylothorax with octreotide.

Material and methods. We used octreotide in three infants, in whom chylothorax complicated cardiovascular interventions (open-heart correction of VSD, coarctation of aorta (CoA) and PDA closure).

Results. Octreotide was started at 14th, 22ⁿ and 80th days of life in three children weighting 870 g (PDA), 2800 g (CoA) and 3400 g (VSD), respectively. The drug was given in 10 µg kg⁻¹ h⁻¹ continuous infusion, without a loading dose, for 5 – 7 days. In two cases chyle leakage was stopped (VSD and CoA) in the PDA case the leakage was only temporarily stopped and secondary surgical intervention was necessary. There was no side effects that could be attributed to octreotide treatment.

Conclusion. Despite low number of cases we regard octreotide as a valuable alternative to difficult surgical management of chylothorax.

CASE REPORT: PERIOPERATIVE MANAGEMENT OF AN INFANT WITH TYPE C TRACHEOESOPHAGEAL FISTULA

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Background. The use of a Fogarty catheter for temporary occlusion of a tracheoesophageal fistula (TEF) to allow ventilation before any surgical correction is useful ⁽¹⁾. We describe the anaesthetic management of a child with type C TEF.

Case report. A full-term baby girl was born with type C TEF. Her birth weight was 2550 g. Other congenital abnormalities included patent ductus arteriosus, ASD, VSD, tricuspid regurgitation, right aortic arch, obvious midline defects (cleft lip and palate) and kidneys' abnormalities. The patient was noted to have respiratory distress when feeding. The nasogastric tube curled up in the upper chest while air was detected in the stomach.

On Day 2 of life she was transferred from an outside hospital to our neonatal intensive care unit (NICU).

On Day 3 of life she was scheduled to undergo surgical repair of TEF.

Routine intraoperative monitors were attached. Prior to induction atropine 0.2 mg was given i.v. After preoxygenation anaesthesia was induced with ketamine and rocuronium. Endotracheal intubation was performed under direct laryngoscopy and positive pressure ventilation was ensued. Soon after intubation, oxygen saturation decreased markedly and bradycardia occurred, which resulted in cardiac arrest. The patient was resuscitated according to APLS guidelines. Minimal breath sounds on auscultation of the chest resulted in extubation and bag mask ventilation. The patient was stabilized and returned to the NICU. Two more attempts in the OR (one for cardiac catheterization) resulted in two more episodes of cardiopulmonary arrest, revealing the difficulty to find the proper position of ETT to successfully ventilate the lungs without ventilation of the fistula.

Consequently, bronchoscopy was scheduled which revealed large TEF (2/3 of right main bronchus) just above the carina ~4mm on the right. Finally the definitive repair was scheduled. On arrival into the operating room, after placement of monitoring consisting of ECG, pulse oximetry, noninvasive blood pressure and end-tidal CO₂, the patient preoxygenated with 100% O₂ and received intravenous atropine, ketamine and rocuronium.

After the induction of anaesthesia the patient underwent bronchoscopy and a 3Fr Fogarty catheter was inserted into the TEF. After isolation of the TEF the patient was intubated with a 3mm diameter endotracheal tube and positive pressure ventilation was ensued. A right thoracotomy, TEF closure and esophagoesophagostomy were performed without complications.

The patient was transferred to the NICU intubated in satisfactory condition.

Discussion. TEF is a test of the anaesthesiologist's airway skills. Sudden episodes of hypoxaemia and bradycardia are not uncommon. Bronchoscopy prior to surgery to assess the fistula size can be of great assistance to successful airway management⁽²⁾.

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ANESTHETIC MANAGEMENT OF A CHILD WITH GLUT-1 GLUCOSE TRANSPORTER DEFICIENCY SYNDROME (GLUT-1DS) – A CASE REPORT

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Introduction. GLUT-1 deficiency syndrome (GLUT-1DS) is a rare genetic disorder, described first in 1991. It affects primarily the central nervous system (CNS), as GLUT-1 is the main glucose transporter in CNS. Clinically it is characterized by seizures, microcephaly and development delay, beginning in the first months of life. GLUT-1 has structure similarities with the GABA receptor¹, with which most intravenous anaesthetic agents interact. It has been proved that barbiturates and benzodiazepines inhibit GLUT-1, worsening this syndrome, and may precipitate seizures². In vitro studies demonstrated that propofol, etomidate and ketamine also inhibit GLUT-1³. Our aim is to describe a possible anaesthetic approach to these patients.

Case report. A five-year-old girl, weight 15k g, was scheduled for elective amygdectomy and adenoidectomy. She had been diagnosed with GLUT-1DS: the first symptoms started at 15 months of age and now presents microcephaly, epilepsy, development delay and ataxia, and was classified as ASA status III. She was under treatment with carbamazepine and under ketogenic diet. No tranquilizer pre-medication was instituted and a balanced general anaesthesia was performed. The induction was inhalatory with sevoflurane 8%, atropine (10ug/kg), fentanyl (3ug/kg) and rocuronium (0.5mg/kg). Maintenance was performed with sevoflurane 2.5% in a mixture of 40% O₂/60% Air. Fluid therapy was maintained with NaCl 0.9%, at a rate of 200ml/1st hour. She was monitored according with ASA's standards, plus neuromuscular block monitor, bispectral index and capillary glucose levels were evaluated each 30min. There were no anesthetic complications and emergence was smooth. She was then transferred to the intermediate care unit for seizures monitoring and glucose level control. She was released to nursery at 24h, after beginning ketogenic diet. There was no episode of seizures and two episodes of vomiting occurred.

Discussion. Little is known about the effects in these patients of drugs used in anaesthesia and there are no publications in MEDLINE on anaesthetic management of this syndrome. Some of what we know comes from the initial use of barbiturates for seizure control in these children and from *in vitro* studies. Although rare, this disorder has anaesthetic implications like the need to avoid drugs that inhibit GLUT-1 and precipitate seizures and the need to avoid glucose administration (in drugs' excipients and fluids). Post-surgery support is convenient to safely monitor seizures, as we know little about the effects of anaesthetic drugs in these patients. In this case the anesthetic strategy proved to be safe and effective, without any significant adverse side effects occurring.

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AIRWAY MANAGEMENT IN NEONATE WITH OCCIPITAL ENCEPHALOCELES

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Background. Encephalocele is a congenital anomaly that consist of glial components. The incidence of encephalocele is approximately 1 in 5.000 live births. The majority of encephalocele occur in occipital region (1). For diagnosis Magnetic Resonance Imaging and 3-dimentional computed tomography are used(2). Difficult intubation is encountered very often condition on congenital anomalies especially in head and neck anomalies. Mallampati and Cormack- Lehan tests can be used to determine the risk of difficult intubation (3).

Case report. A 2980 grams term baby was born with two big-sized occipital encephalocele (two pair 20x15x10 cm). One goal of the anaesthetic was not to rupture the encephalocele. The occipital encephalocele made supine position of head impossible and limited neck extension. We positioned the child in right lateral position and induced anaesthesia with sevoflurane in 100% oxygen by mask. There was no any problem in ventilation of the baby. Anaesthesia induction was made with 3 mg/kg thiopental, 0.5 mg/kg rocuronium. To attempt of direct laryngoscopy in the lateral position showed only tip of the epiglottis (Cormack-Lehane grade 3) and Mallampati 3. We tried to intubate the trachea but we were unable to pass 3 mm uncuffed tracheal tube through the glottic inlet. While proceeding with our third attempt with Sellick manoeuvre, intubation was successful. At the end of 3 hours of anaesthesia, he awakened and was extubated without complications.

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PAEDIATRIC ACHONDROPLASIA AND LIMB LENGTHENING SURGERY – A CHALLENGE TO ANAESTHESIA

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Introduction. Achondroplasia is the most common type of dwarfism and is inherited as an autosomal dominant trait. The selection and management of anaesthesia for the achondroplastic dwarf child is a challenge and must take into account a variety of anatomic deformities. We report the anaesthetic conduct for a nine year old dwarf child born of an achondroplastic mother who went on multiple limb lengthening surgeries.

Methods. Case report of a bilateral leg lengthening with the Ilizarov technique in a dwarf child. The patient had previously been submitted to bilateral thigh and arm lengthening surgery. Her height was 115 cm and weight 25 kg. Preoperative investigations were normal. We used a combined technique with general anaesthesia and lumbar epidural catheter. A L2-L3 epidural catheter was inserted after induction and 7,5 cc of Ropivacaine 0,375% and 2,5 µg Sufentanil were injected 20 minutes before starting surgery. Postoperative analgesia was accomplished with epidural morphine (0,5 mg) and methylprednisolone and intravenous paracetamol.

Results. There were no special difficulties in the anaesthesia management of this child, with stability during surgery and optimal pain control in the post surgery period until discharge home.

Discussion. General and regional anaesthesia pose problems for the achondroplastic dwarf. The trachea may be difficult to intubate and hyperextension of the neck should be avoided because foramen magnum stenosis is common. Patient may suffer from mild restrictive lung disease and central and obstructive sleep apnoea is common. Regional anaesthesia may be technically difficult because of poor landmarks and kyphoscoliosis. A narrow epidural space may make catheter insertion difficult and a subarachnoid tap more likely.

Although the characteristic deformities of achondroplastic children can impede the management of anaesthesia, after careful planning we found no such complications with our patient. Precocious walking is a key factor for the success of this type of procedure and a pain free recovery crucial to that objective. The epidural postoperative analgesia achieved complete pain control.

Conclusion. Combined general anaesthesia with lumbar epidural in leg lengthening surgery in a child with achondroplasia provides optimal intraoperative stability and postoperative pain relief.