Post Surgical Chronic Pain and Quality of life in Children Operated for Congenital Heart Disease

Matsuda M, Takemura H, Yamashita A et. al. Acta Anaesthesiol Scand 2019;63:745-750

There are insufficient information on the prevalence of chornic post surgical pain following cardiac surgery in the paediatric population. The adult incidence of chronic post surgical pain is quoted as 30-50%, but in the children population this is estimated at 20% following a mailed questionnaire. This study's aim is to investigate that chronic post surgical pain lasting beyond 3 months negatively impacts on their long term health –related quality of life, and this investigated using the PedsQL score.

Methods: This is a cross sectional study. The targeted population were patients that were under 10 years of age, and have had cardiac surgery a year before who are subsequently followed up between January and September 2016. Patients and parents were interviewed using a questionnaire at the clinic.

Results: 141 patients were recruited, with just over half of the patients had 2 or more surgeries. 17% of patients reported recurrent or chronic pain, with 33% of these patients rated the pain as moderate to severe. The highest incidence of pain were reported in patients who had lateral thoracotomy. Presence of pain and number of surgeries were significantly associated with PedsQL score. Participants with pain had a lower physical PedsQL subscale score, whilst there are no significant difference in emotional and school subscale.

Take home message

Although this was a single centre cross sectional study, the prevalence of chronic pain following cardiac surgery reported in this study was consistent with previous report of approximately 20% which is lower than the adult population. In this study, it was found that continuous or recurring pain led to significantly reduced PedsQL score which is a measure of health- related quality of life in children.

Reviewed by Dr Yinni Loo

Preoperative Pulmonary Function Test Results Are Not Associated with Postoperative Intubation in Children Undergoing Posterior Spinal Fusion for Scoliosis: A Retrospective Observational Study

Burjek NE, Rao KE, Wieser JP et al. Anaesth Analg 2019;19(1):184-191

Scoliosis are usually associated with abnormal thoracic morphology, resulting in restrictive pulmonary deficit. For this reason, these patients presenting for corrective surgery – posterior spinal fusion are often routinely referred for a pulmonary function tests as part of pre-operative assessment This study's aim is to investigate if pre-operative pulmonary function test results are predictive of post-op ventilation, respiratory morbidity or critical care admission.

Methods: This is a single center, retrospective observational study. The electronic patient records of patients who has had a posterior spinal fusion were examined by the authors.

Results: The authors included 433 patients in this study. Two thirds of these patients had primary scoliosis and the remaining secondary scoliosis. No patients from the primary scoliosis group had to receive postoperative ventilation. 6 were admitted to intensive care postoperatively and none had high risk pulmonary function test results. Almost half of the patients with secondary scoliosis did not attempt a pulmonary function tests as they were unable to perform them due to their physical status. Of the patients with secondary scoliosis that completed pulmonary function tests, 25% revealed a high risk results. Of this 25%, only one patient remained intubated postoperatively.

Reviewed by Dr Yinni Loo

The Migration of Caudally Threaded Thoracic Epidural Catheters in Neonates and Infants

Simpao et al. August 2019. Analgesia and Anaesthesia. Vol 129. Issue 2. Pg 477- 481

Methods: The authors publish a retrospective observational study conducted from 2012 to 2014 examining migration of caudally threaded epidural catheters in children <1 year old. The study centre, The Children's Hospital in Philidephia used radio-opaque Arrow catheters which were fixed in position with dermabond, a tegaderm dressing and tape. Eighty five children were included in the study. The documented thoracic level of the catheter tip using intra-operative fluoroscopy was subtracted from post-operative X-ray imaging to assess migration.

Results: The study reports 64% of children displayed catheter migration either caudad or cephalad and 27% experienced catheter migration to T4 or above. Multiple levels of catheter migration was significantly more common in children <6 kg and < 72 days of age.

Limitations: In this single centre study the assessment of catheter migration is limited to one type of catheter, fixation process and crucially the impact of migration was not assessed in terms of analgesic consequences.

Take Home Message

Potential for caudally threaded epidural catheter migration is high in small infants with implications of inadequate analgesia or complications of a high block. Benefits of post-operative radiographic imaging to confirm catheter position must be carefully balanced with the risks of radiation in children. Catheter confirmation with in plane ultra-sound may be a viable alternative.

Reviewed by Dr Kira Achaibar

Perioperative care of children with sickle cell disease: a systematic review and clinical recommendations

Schyrr et al. American Journal of Hematology. ***(Electronic publication 27th August 2019)***

Methods: The authors conduct a PRISMA based systematic review of the current literature on perioperative sickle cell disease (SCD) in children. A MEDLINE (US National Library of Medicine) search was performed via PubMed database up to 31st January 2019. Evidence for clinical recommendation was evaluated using the GRADE guidance. 1313 studies were identified in the search, 202 met the inclusion criteria. Studies ranged from 1965 onwards, including both adults and children across a variety of surgical specialities. High quality expert reviews to multi-centre RCTs were contained in the data set.

Systematic Review and Recommendations: This review suggests collaborative multidisciplinary teams provide the best perioperative care for children with SCD. Guidance on target transfusion thresholds remains controversial. RCT data reported no difference in postoperative complications with an aggressive versus conservative approach to transfusion perioperatively. The authors recommend pre-operative transfusion should be considered in the context of surgical risk and SCD phenotype of the individual. Whilst regional and general anaesthetic techniques are recognised as safe the focus is on hydration, tissue oxygenation, minimising acid base disturbance and thermo-regulation. Current evidence demonstrates laparoscopic surgery may reduce morbidity compared to open abdominal surgery in the SCD population. Opioid based analgesia is highly recommended. Early chest physiotherapy and incentive spirometry may reduce chest complications.

Limitations: Data informing this review was heterogeneous in study type and often included mixed adult and children studies. The search spanned a wide time scale hence earlier papers were less clinically relevant. Of note, there was little evidence to advise on best emergency SCD perioperative practice.

Future:
A novel tool to help assess SCD perioperative risk is proposed by the authors considering e.g. site and duration of surgery, predicted blood loss, recent SCD crises and phenotype of disease. Future work is required to validate and test this tool in clinical practice.

Reviewed by Dr Kira Achaibar

Incidence of and risk factors for venous thrombosis in children with percutaneous nontunnelled central venous catheters.

Ostlund A, Flaring U, Norberg A et al. British Journal of Anaesthesia 2019; 123 (3): 316 – 324

This was a prospective observational cohort study at a tertiary paediatric hospital in Sweden. Central venous catheters (CVCs) are an important risk factor for venous thrombosis (VT) in children. The primary aim was to determine the incidence of CVC-related VT in a general paediatric population. The secondary aim was to identify risk factors in this cohort.

Methods: The study period was April 2015 to June 2016. Patients <18 years old and >1250 g were included. Patients with pre-existing VT or unlikely to survive or on ECMO were excluded. A standardised form collected data on patient demographics and CVC characteristics and complications including VT. Compression ultrasound with colour doppler was used to diagnose VT either on clinical suspicion or removal of CVC. VT was defined as occlusive / non-occlusive / symptomatic or asymptomatic.

Results: 211/301 children with a CVC sited were included. Median age was 2.7 years and weight 11.4 Kg. Most CVCs were multi-lumen (n=137) and placed in the internal jugular (n=111) or femoral (n=89) vein. CVC-related VT occurred in 64 cases (30.3%) and the majority were non-occlusive and / or asymptomatic (n=49). Multi-lumen CVC, upper body location and male gender were independent significant risk factors. Symptomatic and /or occlusive (SO) VT (n=15) occurred more often in younger children, with CVCs sited in the femoral vessels, a CVC / vein diameter > 0.33 and children on PICU. 45.3% of children were anti-coagulated. VT resolved in 76.4% of cases.

Discussion: VT was detected in almost 1/3 (30%) of children. Children with SO VT had a longer ICU and hospital stay. This could be due to overall increased severity of illness. Risk factors that could be modified include which vessel the CVC is sited in and the size / number of lumens of CVC. Further studies would be needed to support this.

Reviewed by Dr Hannah Lewis

Epidemiology of Regional Anaesthesia in Children: Lessons learned from the European Multi-Institutional Study APRICOT

Dadure C, Veyekemans F, Bringuier S et al. Paediatric Anaesthesia. 2019. September: 1-9.

The Anaesthesia Practice in Children Observational Trial (APRICOT) study is a prospective observational multicentre cohort study that took place in 33 European countries. 261 centres participated. This was a secondary analysis that looked at the epidemiology of regional anaesthesia (RA) in paediatric patients in Europe. The primary aim looked at distribution of central and peripheral nerve blocks. Secondary aims included RA techniques and local anaesthetics (LA) used.

Methods: Each centre collected data for a 2-week period anytime between April 2014 and

January 2015. All children 16 years old and younger, having sedation or general anaesthesia, with or without RA, were included. Follow up was for 60 minutes after anaesthesia. Information on the type of RA, technique and local anaesthetics used was collected. Patient demographics and surgery type were recorded.

Results: A total of 4,377 / 22,224 children had peripheral or central nerve blocks. The majority of RA occurred in 3-11 year olds, having general anaesthesia for elective surgery. Central (76.9% caudal) and truncal blocks were most common occurring in 42.6% and 41.8% cases respectively. The majority of central (97%) and craniofacial (89%) blocks used landmark techniques. Ultrasound guidance was used for 66% upper limb, 70% lower limb and 96% transverse abdominal plane (TAP) blocks. The most common LA and adjuvant used were levobupivacaine (37.6%) and ropivacaine (37.1%) and clonidine (9.1%). RA was performed on the wrong side in one case.

Discussion: Rates of RA use are similar to other studies. Peripheral nerve blocks were performed more frequently than central blocks and with ultrasound in the majority of cases. It is important to note that APRICOT was not designed to look at RA and only looked at acute complications such as LA toxicity. It was not powered for complications and did not follow up for long term complications including nerve damage.

Reviewed by Dr Hannah Lewis

Edited by Dr Christa Morrison