Randomized Trial of Platelet-Transfusion Thresholds in Neonates

Curley A, Stanworth SJ, Willoughby K, et al. *N Eng J Med* 2019; 380:242-51

Prophylactic platelet transfusion is a common practice to prevent bleeding in preterm infants with thrombocytopaenia. There are large variations in practice between clinician and institutions and a lack of data to compare clinically relevant outcomes associated with currently used platelet count thresholds.

Methods: This is a multicentre trial. Neonates born before 34 weeks gestation with severe thrombocytopenia were allocated into two groups (high threshold and low threshold group) to receive their platelets transfusion. The high threshold group was transfused at a platelet count of 50,000 per cubic millimetre whilst the low threshold group was transfused at a platelet count of 25,000 per cubic millimetre. The primary outcome measured was death or new major bleeding in 28 days.

Results: 660 neonates were included. 90% of neonates received platelet transfusions in the high threshold group whilst only 53% received a transfusion in the low threshold group. There was a higher incidence of death and new major bleeding in the high threshold group (26% vs 19%, P=0.02) compared to the low threshold group. There were no significant differences between the groups in secondary outcomes that included minor bleeding, bronchopulmonary dysplasia and retinopathy of prematurity.

Conclusion: There is a higher incidence of death and major bleeding within 28 days in pre-term infants receiving platelet transfusion at the higher threshold platelet count of 50,000 per cubic millimetre. The reason for this is unknown.

Reviewed by Dr Yinni Loo

Incidence of peri-operative paediatric cardiac arrest and the influence of a specialised paediatric anaesthesia team

Hohn A, Trieschmann U, Franklen J et al. *EJA* 2019; 36(1): 55-63

Perioperative critical events such as cardiac arrest, although rare, pose a major problem to paediatric anaesthesia care. This is a study performed in a tertiary university hospital in Germany, analysing incidences of perioperative paediatric cardiac arrest before and after the introduction of a specialised paediatric anaesthesia team and training programme.

Methods: This is a retrospective cohort study looking at anaesthesia delivered to paediatric patients between 2008 and 2016. A total of 36 243 paediatric anaesthetics were included. The

specialised paediatric anaesthesia teams were introduced in 2014. A before and after analysis was performed.

Results: The overall incidence of peri-operative cardiac arrest was 8.1/10 000 pre 2014 and this reduced to 4.6/ 10 000 post 2013 following the introduction of specialised paediatric anaesthesia teams. The incidence of anaesthesia-attributable cardiac arrest also decreased in the period post 2013. It was calculated that children anaesthetised after 2013 had a 70% lower probability of anaesthesia-attributable cardiac arrest.

Conclusion: The implementation of a specialised paediatric anaesthesia team and training programme was associated with a lower incidence of perioperative paediatric cardiac arrest. Young age was a contributory risk factor for the anaesthesia-attributable cardiac arrest.

Reviewed by Dr Yinni Loo

Comparison of caudal epidural block with paravertebral block for renal surgeries in paediatric patients: A prospective randomised, blinded clinical trial

Narasimhana P, Kashyapa L, Mohana VK, et al. *Journal of Clinical Anesthesia* 2019; 52: 105–110

The authors of this study suggest that paravertebral blocks are performed less frequently than caudal blocks in their institute due to operator inexperience and a perceived risk of pneumothorax. One major advantage of paravertebral block over caudal block is the reduced volume of local anaesthetic required for the former.

This was a prospective, randomized, single-blinded study of 50 children (25 per group) aged 2-10yrs old undergoing Anderson-Hynes pyeloplasty. The primary outcome was the time taken to receive a rescue dose of analgesia. The intervention compared single-shot caudal block (1.25ml/kg of 0.2% ropivicaine with 1:200 000 adrenaline) with single-shot paravertebral block (0.5ml/kg of 0.2% ropivicaine with 1:200 000 adrenaline) at the level of T10. All blocks were performed with ultrasound guidance following induction of general anaesthesia. An initial bolus of 2mcg/kg fentanyl at induction was followed by further 1mcg/kg boluses intra-operatively if specific haemodynamic parameters suggested inadequate analgesia.

There was no statistically significant difference in intra-operative haemodynamic measurements between the groups. These were comparable for 24hrs post-operatively. Post-operative complications (eg. nausea and vomiting, urinary retention) were also comparable between groups.

While intra-operative fentanyl requirements were also comparable, FLACC scores were higher from 3hrs post-operatively in the caudal group and the time to first rescue analgesia (1mcg/kg fentanyl) was shorter in this group (391.8 ± 217.4 min (CI: 290–493.5) vs 664.4 ± 223.4 min (CI: 492.7–836.2)

in comparison to the paravertebral group. One theory postulates the shorter duration of the epidural block is due to the great vascularity of this space.

Reviewed by Dr Tom Woodward

South African Paediatric Surgical Outcomes Study: a 14-day prospective, observational cohort study of paediatric surgical patients

Torborg A, Cronje L, Thomas J, et al. *British Journal of Anaesthesia* 2019; 122(2):224-232

This study aimed to identify peri-operative complications unique to low and middle-income countries (LMICs). Forty-two government-funded hospitals enrolled in a prospective observational cohort study including children (aged <16 yrs) admitted over a 14-day period undergoing a surgical procedure requiring general anaesthesia. The 2024 patients included had an average age of 5.9 years.

High-Income Countries (HICs) report complication rates of 1.1-6.2% with the commonest being *non-infective* complications. This study found an overall complication rate of 9.7% with the commonest postoperative complication being *infective*; most commonly surgical site infection. The majority (64.8%) of surgery was of 'routine' urgency with a complication rate of 5.1%, whilst 15% of patients underwent 'emergency' surgery with a complication rate of 20%. The commonest types of surgery were orthopaedic (21.1%) and ENT (12.8%). Surgery indicated for 'infective' reasons had the highest complication rate (14.6%).

Risk factors for complications in HICs are typically related to gestational age, ASA score > 3, a history of cardiovascular co-morbidities and the type of surgery. In contrast, this study demonstrated that infection, ASA grade, the urgency and severity of surgery were independently associated with postoperative complications. The in-hospital mortality rate was 1.1% with a third of these occurring <1 day and 40% being in ASA 1 or 2 patients. Over half (54.4%) of those dying were not admitted to a critical care setting at any stage. The authors suggest that further studies of this nature may generate unique surgical risk calculators specifically for use in LMICs; thus enabling decision-making, interventions and resources to be more appropriately allocated.

Reviewed by Dr Tom Woodward

Does the Incidence of Postoperative Complications After Inguinal Hernia Repair Justify Hospital Admission in Prematurely and Term Born Infants?

Massoud M, A.Y. Kuhlmann A Y, Van Dijk et al. *Anesthesia and Analgesia* 2019; 128(3):525–532

This is a retrospective cohort study at a single tertiary referral centre in the Netherlands. The study aimed to establish the incidence of complications in infants having inguinal hernia surgery and whether this necessitates overnight admission.

Methods: Data was collected from January 2011 to December 2015. Patients were divided into 3 groups: premature infants < 45 weeks post correctional age (PCA), premature infants 45 – 60 weeks PCA and term infants < 3 months old. Premature infants < 45 weeks PCA had 24 hours of continuous monitoring (respiratory rate, saturations and ECG) postoperatively. Premature infants 45 – 60 weeks received 2 hours of continuous monitoring. Term infants <3 months old had 30 minutes of continuous monitoring. The later two groups were then admitted overnight to the surgical ward. Complications were defined as desaturation (86 –90%), apnoea (saturation ≤ 85% or requiring mask ventilation) and bradycardia (heart rate <80).

Results: A total of 485 cases were included. Postoperative complications occurred in 9% of cases. Premature infants <45 weeks PCA had increased postoperative complications. All apnoeas occurred in the premature groups but most frequently in infants < 45 weeks PCA (n=17 of 20). Desaturations occurred more often in premature infants. Infants <45 weeks PCA should have 24 hours continuous post-operative monitoring. Respiratory complications in the 45 – 60 week PCA group varied with infants of a lower gestational age and prior respiratory disease suffering more complications. The importance of these factors and deciding the length of post-operative monitoring need further investigation in this group. Complications in term born ASA 1 or 2 infants > 1 month old are low making day-case admission appropriate.

Reviewed by Dr Hannah Lewis

Epidemiology and incidence of severe respiratory critical events in ear, nose and throat surgery in children in Europe. A prospective multicentre observational study.

Virag K, Sabourdin N, Thomas M, et al. *European Journal of Anaesthesiology* 2019; 36:185–193

This was a secondary analysis of the prospective observational multicentre study (APRICOT). The primary aim was to establish the incidence of respiratory severe critical events (SCEs) in ENT surgery. Secondary aims looked at risk factors for SCEs and compared children having ENT surgery versus other types of surgery.

Methods: The study period ran from April 2014 to January 2015. Each centre participated 2 consecutive weeks. All children <16 years were included. SCE's were defined as any laryngospasm, bronchospasm or postoperative stridor that required medication. Data was recorded for up to 1 hour post-operatively and at 30 days.

Results: 5,572 children having ENT surgery and 15,952 having non-ENT surgery were included. SCEs occurred more frequently in children having ENT surgery compared to those not. The biggest difference was seen in postoperative stridor: n= 78 children (1.39%) vs 83 children (0.52%). Occurrence of SCE's in the ENT group were laryngospasm in 86 (1.39%), bronchospasm in 85 (1.52%) and postoperative stridor in 78 (1.39%). Patient risk factors were a younger age (<4.6

years), African ethnicity, snoring, prematurity, respiratory infection <2 weeks, wheezing <12 months and atopy. Centres undertaking < 20 ENT procedures / 2 week period had higher SCEs. The use of a supraglottic airway device (SGA) with removal awake had the lowest complications for airway management.

Discussion: The authors recommend no conclusion on type of airway device or timing of removal in light of different contrasting studies. Snoring was a universal risk factor and the authors suggest implementation of the STBUR (snoring, trouble breathing, un-refreshed) questionnaire in pre-assessment. Consideration of an age threshold for referral to specialist centres and ensuring centres perform a minimum number of ENT surgeries could reduce complications.

Reviewed by Dr Hannah Lewis