FROM THE JOURNALS

Journal Skimmers: Anaesthesia - Dr Peter J. Shirley; Anesthesia and Analgesia - Dr Yue Dong; Anesthesiology - Dr Mike Girgis British Journal of Anaesthesia - Dr Paul Sice; Canadian Journal of Anesthesia - Dr Aneeta Sinha

Plasma paracetamol concentrations after different doses of rectal paracetamol in older children. A comparison of 1g vs. 40mg/kg. Howell TC, Patel D *Anaesthesia* 2003;**58**:69-73.

This paper compared the levels of paracetamol reached following rectal administration in healthy children to see if therapeutic levels (>10μg/ml) were present. The authors make initial observations that paracetamol is often given rectally to children in accident and emergency departments, operating theatres and intensive care units for both antipyretic and analgesic effects. They also note that sub-therapeutic doses of paracetamol have been given in the past and that initial rectal doses of 35 - 45mg/kg are now recommended. Whilst the therapeutic range for analgesia is not well established other work has demonstrated little or no analgesic benefit below a plasma level of 10μg/ml.

All children were undergoing elective spinal surgery and were excluded if paracetamol had been administered within 24 hours or if they were on regular paracetamol before attending hospital. Children over 25kg were enrolled and randomised to receive either a dose of 1g or 40mg/kg rectally. Commercially available suppositories in 60, 120, 240 and 500mg preparations were used to deliver as close to the required dose as possible. No suppository was cut, as it is recognised that paracetamol is not distributed evenly throughout each suppository.

Twenty-two children were included and plasma paracetamol levels were measured at 2, 3, 4 and 5 hours post-dose. Blood was taken from an indwelling central line inserted as part of the anaesthetic for the surgical procedure. The mean plasma level at 2, 3, 4 and 5 hours in the group receiving 1g paracetamol did not achieve a therapeutic level, whereas the mean plasma level in the 40 mg/kg group was in the therapeutic range at all times (three children in this second group did have plasma levels that fell just short of the therapeutic range). When subjected to statistical analysis there was a significant difference between the two groups ($p = 0.01$). The toxic level of plasma paracetamol is considered to be 120μg/ml; the maximum level reached in this study was 45μg/ml.

The conclusion reached is that 1g of rectal paracetamol is insufficient in children weighing >25kg and that doses of 40mg/kg should be used. This dose will result in plasma paracetamol levels well below those associated with toxicity. Paracetamol is also known to have a morphine sparing effect of >36% when administered correctly.

The paper concludes with questioning the effectiveness of rectal doses of 1g of paracetamol in adults and asks whether doses of 2g would be more appropriate. However, they point out that this inference cannot necessarily be acted on, as adults metabolise paracetamol differently to children and are more prone to hepatoxicity. More work would be required to establish the appropriate dose in adults.

Volatile agents to avoid ventilating asthmatics
Baigel G. *Anaesthesia and Intensive Care* 2003;**31**:208-10

Six patients with severe asthma (five of them with a previous history of mechanical ventilation) and with severe dyspnoea, tachycardia, hypertension and blood gases indicating the need for immediate intubation and mechanical ventilation were recruited. All patients were receiving six hourly hydrocortisone, salbutamol and ipratropium bromide nebulisers, intravenous aminophylline as bolus and infusion and terbutaline infusions. Ketamine was not being given.

Instead of intubating the patients, they were given Halothane 0.5% (five patients) or Sevoflurane 0.25% (one patient) in oxygen. Administration was via a facemask connected to a Bain circuit using a Tech 3 vaporizer. Patients were asked to hold the facemask themselves, thus avoiding over-sedation and maintaining verbal contact.

All patients responded immediately and showed improved blood gases after 15 minutes. The wheeze disappeared rapidly, the heart rate and respiratory rate returned to near normal.

The vapour was administered for between 45 and 173 minutes, and five patients needed only this one period of treatment during their hospital stay. One patient needed intubation later during a second attack.

The bronchodilatory effect of halothane is well recognised, although the mechanism of action is still unclear. A direct β-mimetic effect as well as a blockade of vagal reflexes is possible (although the effect is not attenuated by β-blockers). A second mechanism is the sedating and therefore anxiolytic effect of low concentrations of Halothane. The same mechanisms are likely to apply for Sevoflurane.

Except for one episode of ventricular ectopics in one patient (with high blood levels of aminophylline) no complications were observed. The author therefore judges the therapy a safe and effective method to prevent intubation and mechanical ventilation in severe asthma attacks.

Lidocaine sprayed down the endotracheal tube attenuates the airway-circulatory reflexes by local anesthesia during emergence and extubation. Daelim Jee and So Young Park *Anesthesia and Analgesia* 2003;**96**:293-297

The authors designed a study to compare the reflex response after lidocaine spray through the endotracheal tube and intravenous administration during extubation. Seventy-five patients receiving a standard anaesthetic were divided into three groups: controls, those receiving 1mg/kg 2% lidocaine sprayed down the ET 5 min before extubation and those given 1mg/kg 2% lidocaine IV 3 minutes before extubation. Patients BP, HR, number of coughs and rate of coughing were recorded from 5 min before until 5 min after extubation.

The group receiving ET lidocaine spray during extubation had significantly less numbers of coughs per patient during extubation compared to controls and the IV group (4.5 +/- 3.7 vs. 10.2 (6.0 and 7.8 (+/-4.6, $p<0.01$ and $p=0.06$). Although the cardiovascular parameters (systolic/ diastolic blood pressure, heart rate) changed compared to baseline levels, those in the ET group increased less compared with control and IV groups.

Lidocaine is relatively safe and has various applications. ET spray is not a new idea. Careful monitoring of cardiovascular and respiratory vital signs is needed to exclude any potential adverse effects (systematic toxicity). This study shows that lidocaine can be used topically to prevent extubation reflex responses (especially coughing).

Effects of postoperative non-steroidal anti-inflammatory drugs on bleeding risk after tonsillectomy. *Anesthesiology* 2003;**98**:1497-1502

The authors performed a literature search for pertinent studies published between 1966 and 2001. The quality of each study was assessed using the Jadad composite scale and only those that were randomised, double-blind and with a score greater than 3 were included. Outcome measures were the need for surgical electrocautery to stop postoperative bleeding, or postoperative bleeding requiring a change in management i.e. admission to the emergency department, readmission to hospital, or blood transfusion. Bleeding was defined as primary if it was within 24hrs after surgery, and secondary if it occurred later. They found 90 articles in total of which only 20 were randomised controlled trials and of those only seven met the selection criteria to be included. All seven were published in or after 1995 and included a total of 505 patients. Perioperative NSAIDs used were ketorolac, ketoprofen or ibuprofen. Placebos received saline, paracetamol, codeine, morphine or meperidine (pethidine).

Of the 243 controls, 13 (5.3%) had primary or secondary postoperative bleeding, 7 of these being secondary. Of the 262 patients who received NSAIDs 24 (9.2%) had postoperative bleeding (odds ratio 1.8; 95% CI 0.9-3.4), 15 of these being secondary. Only two of the control patients (1 primary and 1 secondary) required re-operation for haemostasis, compared with 11 in the NSAID group (5 primary and 6 secondary).

This produces a significant difference in the rate of reoperation for haemostasis: 0.8% for controls compared with 4.2% for those given NSAIDs (odds ration 3.8; 95% CI 1.3-11.5; P=0.02).

This study suggests that NSAIDs increase the incidence of re-operation for post-tonsillectomy bleeding five fold. 'Number needed to harm' was 29 (95% CI 17-144) for re-operation despite some patients receiving only a single dose of NSAIDs ie the use of NSAIDs in 29 patients would result in haemorrhage severe enough to require reoperation in at least one patient. Reoperation for haemorrhage from tonsillectomy site bleeding is associated with a high risk of morbidity related to pulmonary aspiration and difficult intubation. It was concluded that conventional NSAIDs should not be used after tonsillectomy. The authors also suggested that since specific COX-2 inhibitors do not inhibit platelet aggregation in vitro, these may provide similar pain relief without the associated risk of bleeding.

Prevention of postoperative nausea and vomiting after spinal morphine for Caesarian section: comparison of cyclizine, dexamethasone and placebo. Nortcliffe SA, Shah J and Buggy DJ. *British Journal of Anaesthesia* 2003;**90**:665-70

This study investigated the efficacy of cyclizine 50mg, dexamethasone 8mg and placebo in preventing postoperative nausea and vomiting (PONV) after intrathecal morphine for Caesarian section.

ASA I and II patients presenting for elective Caesarian section were randomised to receive one of the antiemetics or placebo. Following ranitidine premedication, anaesthesia to the T4 dermatome was established with hyperbaric bupivicaine 0.5% 2ml, with 10mcg of fentanyl and 0.2mg of preservative-free morphine. All patients also received intravenous crystalloid (with ephedrine boluses for hypotension) and rectal diclofenac. The primary outcome measure was the incidence of nausea in the first 24hrs. Nausea severity, incidence of vomiting and VAS pain assessments were also collected at 3,6,12 and 24 hrs postoperatively.

30 patients per group completed the trial, the groups being closely matched. The incidence of PONV, and the need for prochlorperazine rescue antiemetic, were all significantly reduced in the cyclizine group. The incidence of nausea was 67% in the placebo group compared with 60% for dexamethasone and 33% for cyclizine. The incidences for vomiting were similar, and rescue antiemetic was needed for 4 patients after cyclizine, compared with 17 after dexamethasone. Overall patient satisfaction scores were significantly higher after cyclizine.

This study reiterated the high incidence of PONV after intrathecal morphine. It is interesting that dexamethasone was little better than placebo having been shown to be effective after general anaesthesia and epidural morphine, and the group speculate a different mechanism of PONV for the epidural and intrathecal routes.

Spinal anaesthesia is commonly employed worldwide for Caesarian section and although intrathecal morphine can provide good analgesia up to 24hrs postoperatively, PONV is common. Cyclizine, which is widely available, well tolerated and cheaper than the new 5-HT3 antagonists, has been shown to significantly reduce this problem and improve patient satisfaction.

Dexamethasone reduces postoperative vomiting and pain after paediatric tonsillectomy. Elhakim M, Ali N, Rashed I, Riad M K, Refat M *Canadian Journal Of Anesthesia* 2003;**4**: 392-397

The aim of this study was to evaluate the effects of a single dose of dexamethasone on the incidence and severity of postoperative vomiting and pain in children undergoing electrocautery tonsillectomy under a standardised general anaesthetic.

In a double-blinded study, 120 patients were randomly allocated to receive either dexamethasone 0.5 mg/kg (maximum 8 mg) IV or an equivalent volume of saline preoperatively. The standardised anaesthetic used involved premedication with oral midazolam 0.5mg/kg (maximum 20mg), induction with sevoflurane and suxamethonium 1mg/kg to facilitate intubation. Maintenance was

with sevoflurane/N_2O/O_2 (FiO_2 0.4). All children received fentanyl 1 mcg/kg before surgery and 20mL/kg lactated Ringer's solution during the operation. Prior to awake extubation, gastric contents were suctioned via an orogastric tube. A standardised starving regime was implemented prior to the anaesthetic.

The incidence of early and late vomiting, need for rescue antiemetics (metoclopramide 0.15 mg/kg iv), time to first oral intake, time to first demand of analgesia and analgesic consumption (paracetamol 30mg/kg PR 6 hourly, as necessary or pethidine IV for rapid pain relief) were compared in both groups. Pain scores used included the Children's Hospital Eastern Ontario Pain Scale (CHEOPS), "faces" and a 0-10 visual analogue pain scale (VAS).

Compared with placebo, dexamethasone significantly decreased the incidence of early and late vomiting ($p < 0.05$, $p < 0.001$ respectively). The administration of dexamethasone reduced the overall incidence of postoperative vomiting from 56% to 20% when compared with saline ($p < 0.001$). Fewer patients in the dexamethasone group required antiemetic rescue ($p < 0.01$). The time to first oral intake was shorter and the time to first dose of analgesic was longer in the dexamethasone group ($p < 0.01$). Pain scores were significantly lower in the dexamethasone group at 30 minutes ($p < 0.05$), 4 hours ($p < 0.05$), 6 hours ($p < 0.05$), 12 hours ($p < 0.01$) and 24 hours ($p < 0.01$).

In conclusion, a prophylactic, pre-operative, single dose of dexamethasone (0.5 mg/kg) appears to reduce both postoperative vomiting and pain in children after electrocautery tonsillectomy.