Welcome to the seventh issue of Anaesthesia and Pain Management Research Review.

This final issue for 2015 includes research from a nursing journal describing an educational programme aimed at emergency department nurses for assessing pain in children. Australian research found that patients with low back pain can identify standard triggers, but weren't so good at identifying others such as distractions during manual tasks. Research from the Republic of Korea using a sequential up-down analysis to identify the best dose of dexmedetomidine for preventing emergence agitation in children after desflurane anaesthesia highlights the potential value of this protocol for refining aspects of practice at individual institutions. The year concludes with a meta-analysis on the effect of a liberal versus a restrictive transfusion strategy on mortality, with findings for the perioperative setting that are at odds with previous meta-analyses, probably due to the inclusion of three large RCTs published earlier this year.

We wish you all a safe and enjoyable holiday season, and we look forward to returning with the next issue in 2016.

Kind regards,

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Early physical therapy vs usual care in patients with recent-onset low back pain

Authors: Fritz JM et al.

Summary: Patients with low back pain meeting several defined criteria received education with either four early physical therapy sessions (n=108) or usual care (i.e. no additional interventions during the first 4 weeks; n=112) in this RCT; 94.1% of participants completed 1 year of follow-up. Compared with usual care, early physical therapy was associated with an improvement in mean Oswestry Disability Index score at 3 months (primary outcome; difference −3.2 [p=0.02], which was apparent as early as week 4 (−3.5 [p=0.045]), but did not last out to 1 year (−2.0 [p=0.19]) and, similarly, improvements in Pain Catastrophizing Scale scores at 4 weeks and 3 months, but not 1 year. No significant between-group difference was seen for improvement in pain intensity or healthcare utilisation at 4 weeks, 3 months or 1 year.

Comment (GL): This is another attempt to deal with low back pain, this time with a select group who were more likely to respond to physiotherapy. I’m not surprised by the lack of difference between the groups at 1 year given that it was an acute back pain event that was treated. If they had stopped the trial at 3 months, where there were a number of advantages in the therapy group, they would have likely ended with a different conclusion. What I found interesting were the marked reductions in catastrophising and aspects of fear avoidance with physical therapy. Were there some closet psychologists amongst the therapists? These are both risk factors for chronic pain and poor outcomes following treatment. Just seeing a friendly clinician seems beneficial, irrespective of what they do.


Abstract

Pediatric pain assessment in the emergency department: a nursing evidence-based practice protocol

Authors: Habiesch M & Letizia M

Summary: This paper reported on a project that involved 78 nurses from emergency departments completing a paediatric pain education programme consisting of an online module with content addressing paediatric pain assessment and management, and also on the subsequent use of the pain assessment protocol in practice. Evaluations of the programme were judged to be very positive, with a significant difference seen between mean pre- and post-test scores; reliability of the test was strong. A review of 60 patient medical records 2 weeks after the educational programme showed that the most consistently used protocol components were pain assessment at triage and use of an appropriate pain scale for all assessments, but assessment of pain characteristics was low.

Comment (GL): Paediatric pain assessment is tricky but vital. This paper provided some rather eye-opening findings to me. The first was that only 54% of nurses felt confident in assessing pain after viewing the programme. I find this low number astonishing, and it leads me to question the success of the programme overall. Secondly, less than one-third of children with documented pain received an intervention. Surely better assessment should promote better management? Finally, some nurses scored as low as 15% on the pre- and post-tests, which doesn’t give me a lot of confidence in their pain assessment knowledge. I think the authors concluding statement that “education and availability of practice standards alone may not translate to actual improvement in care delivered by nurses” is quite telling.

Reference: Pediatr Nurs 2015;41(4)

Abstract

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www.researchreview.co.nz
Routine screening for pain combined with a pain treatment protocol in head and neck cancer

Authors: Williams JE et al.

Summary: In this RCT, 156 patients with pain associated with head or neck cancer received an intervention of a pain treatment protocol and an education programme or usual care. Decreases in PSI (Pain Severity Index) scores over 3 months (primary outcome) occurred in both groups, but with no significant between-group difference. However, compared with usual care, the intervention was associated with significant improvements in PMI (Pain Management Index) score at 3 months (p<0.001) and patient satisfaction scores, and the participants reported clinically significant improvements in anxiety and depression. The mean cost of the intervention was twice that of usual care (£400 vs. £200), and its likelihood of being cost effective was low.

Can patients identify what triggers their back pain? Secondary analysis of a case-crossover study

Authors: do Carmo Silva Parreira P et al.

Summary: Exposures to 12 standard triggers for back pain were investigated in 999 primary care patients who were asked in an interview what they believed triggered their back pain. Exposures to the patient-nominated triggers during the 24 hours before a back pain event (cases) were compared with exposures during 24–26 hours and 48–50 hours before back pain onset (controls). The ORs for patient-nominated exposures to low back pain triggers were 8.60–30.00. Some standard triggers were found to be well recognised (e.g. lifting heavy loads), but others were under-recognised (e.g. being distracted during manual tasks).


Arrow-Meloxicam for Arthritis Pain
A Cox-2 Selective NSAID

- Treatment of the symptoms of painful osteoarthritis and rheumatoid arthritis.
- Prescription medicine containing 7.5mg of Meloxicam.

Treatment with Arrow-Meloxicam should be with the lowest dose and for the shortest period. The decision to prescribe a selective COX-2 Selective NSAID should only be made after assessment of an individual patient’s overall risk of developing severe adverse effects e.g. cardiovascular, renal and gastrointestinal disease and after use of alternative therapies and simple analgesic therapy where these have been found to lack analgesic efficacy or have unacceptable side effects. Patients on long-term treatment should be reviewed regularly with regard to efficacy, risk factors and the ongoing need for treatment. Dose for OA and RA is normally 7.5mg daily which can be increased to 15mg daily. In patients with renal impairment/failure the dose should not exceed 7.5mg daily. 

Central Adverse Effects: Signs of asthma, nasal polyps, angioedema or urticaria following administration of aspirin or other NSAIIDs; Active or recent GI ulceration/perforation, active inflammatory bowel disease, severe hepatic or renal insufficiency, overt GI or centrovacular bleeding, severe uncontrolled heart failure, patient with a previous MI or stroke, in the peri-operative period for patient undergoing cardiac surgery, including CABG or major vascular surgery. Children aged less than 12 years, pregnancy and lactation.

Warnings: Patients with cardiovascular disease, a history of asthma, serious GI bleeding, ulceration and perforation of the stomach & GI tract, minor upper GI problems such as dyspepsia, serious skin reactions, renal or hepatic disease, not a substitute for anti-platelet therapies, which should not be discontinued. Concurrent use of aspirin negates the GI benet conferred by COX-2 Selective NSAID including Arrow-Meloxicam. May mask symptoms of underlying infectious disease, women trying to conceive. Adverse Effects: May include diarrhoea, constipation, abdominal pain, dyspepsia, atuness, nausea, vomiting, headache, fatigue. Interactions: Co-administration with Prostaglandin Synthetase Inhibitors (PGE) including glucocorticoids and salicylates and other NSAIDs should be avoided. Check the list of drug interactions and other risk information in the full prescribing information at www.medsafe.govt.nz. TAPS NA R598

ACTAVIS NEW ZEALAND LTD, Auckland. Phone 630 4448, Fax 09 630 4490, E Mail enquiries@actavis.co.nz
The development and delivery of a female chronic pelvic pain management programme: a specialised interdisciplinary approach

Authors: Tviddy H et al.

Summary: This paper reported the development and delivery of an interdisciplinary pain management programme for UK women with chronic pelvic pain. Early outcome data indicate that the programme’s participants have been able to make clinically important changes across a number of outcome measures. Furthermore, the clinically significant outcomes of the programme compared favourably with an established pain management programme for generalised chronic pain. The programme’s participants also indicated that they felt it was useful and supportive to be part of a group environment dedicated to managing chronic pelvic pain.

Comment (GL): Women with chronic pelvic pain often emphasise outcomes relating to relationships and parenting rather than physical activity goals. Thus, the establishment of specialist pelvic pain management programmes that can accommodate these specific needs appears warranted. This study described the design and delivery of an interdisciplinary programme that incorporates such themes into a standard chronic pain management programme. Although only preliminary data were presented here, there were some notable improvements in psychosocial, occupational and physical activity outcomes that were maintained at follow-up. It is noteworthy that there was little change in pain intensity ratings, suggesting that the psychologically-based programme influenced the impact of pain rather than pain itself.


A randomised controlled trial of intravenous dexamethasone combined with interscalene brachial plexus blockade for shoulder surgery

Authors: Desmet M et al.

Summary: Patients scheduled for shoulder rotator cuff repair or subacromial decompression under general anaesthesia and interscalene brachial plexus blockade with 0.5% ropivacaine 30ml were randomised to receive preoperative IV dexamethasone 1.25mg (n=60), 2.5mg (n=60) or 10mg (n=60) or 0.9% saline (n=60). Compared with saline, preoperative dexamethasone at the 2.5mg and 10mg doses was associated with a significant increase in median time to first postoperative analgesic request (17.4 and 20.1, respectively, vs. 12.2 hours [p<0.001 for both]); the median time with dexamethasone 1.25mg was marginally longer than with saline at 14 hours (p=0.05). Participants undergoing rotator cuff repair received postoperative analgesia sooner than those undergoing subacromial decompression (hazard ratio 2.2 [95% CI 1.6, 3.0]), and each increasing year of age increased the time to postoperative analgesia (0.98 [0.97, 0.99]).

Comment (JB): The action of dexamethasone to prolong the effect of regional anaesthesia and analgesia is most likely indirect. The two critical lines of evidence pointing to this conclusion are that adding dexamethasone to local anaesthetic blocks of isolated sciatic nerves using a rat model demonstrated little effect and that perineural injection of dexamethasone is no more effective than using the IV route. Another clue is provided by this study, which showed some effect even from quite small doses (2.5mg of IV dexamethasone). The authors hypothesised that the reason they were able to show a prolongation of IV dexamethasone was that they gave the dexamethasone early. A slow onset of effect is probably the most studied in regional anaesthesia. Gabapentin also reduced mean postoperative 10-point pain scores at various timepoints out to 24 hours by 0.71–1.68 points (p<0.001 for all), reduced mean preoperative 10-point anxiety score by 1.52 points (p<0.001) and increased mean 10-point patient satisfaction score by 0.89 points (p=0.01). The risks of postoperative nausea, vomiting and pruritus were reduced with gabapentin (respective risk ratios 0.78 [95% CI 0.69, 0.87], 0.67 [0.50, 0.76] and 0.64 [0.51, 0.80]), and the risk of sedation was increased 1.18 [1.09, 1.28].

Reference: Anaesthesia 2015;70(10):1186–204

A systematic review and meta-regression analysis of prophylactic gabapentin for postoperative pain

Authors: Doleman B et al.

Summary: This systematic review and meta-regression analysis of data from 133 RCTs found that compared with placebo, perioperative gabapentin was associated with less morphine-equivalent consumption over 24 hours by 8.4mg (p<0.001), irrespective of surgery type – the following meta-regression equation predicted more specific reductions in morphine equivalents (R²=90% [p<0.001]: 3.73 + (–0.378 × control morphine consumption in mg) + (–0.0023 × gabapentin dose in mg) + (–1.917 × analgesic type), where “analgesic type” is “1” for general anaesthesia and “0” for spinal anaesthesia. Gabapentin also reduced mean postoperative 10-point pain scores at various timepoints out to 24 hours by 0.71–1.68 points (p<0.001 for all), reduced mean preoperative 10-point anxiety score by 1.52 points (p<0.001) and increased mean 10-point patient satisfaction score by 0.89 points (p=0.01). The risks of postoperative nausea, vomiting and pruritus were reduced with gabapentin (respective risk ratios 0.78 [95% CI 0.69, 0.87], 0.67 [0.50, 0.76] and 0.64 [0.51, 0.80]), and the risk of sedation was increased 1.18 [1.09, 1.28].

Comment (JB): Probably the most important statement made in this study is the recommendation to avoid doing any more small RCTs aiming to measure the benefit of gabapentin as an adjunct to morphine for postoperative analgesia. Even though the funnel plot showed some lop-sidedness, 133 small studies are enough. Larger scale studies are needed if researchers want to define the effects of gabapentin with greater precision in this setting. It is worth putting some numbers into the meta-regression equation to make the test of the conclusions come alive. Imagine a couple of patients lining up for knee joint replacement under general anaesthetic. One has a high morphine requirement in the first 24 hours after surgery, using 90mg from their patient-controlled analgesia, and the other patient is the opposite, using only 10mg. If they had both received 300mg of gabapentin as a co-analgesic, then the patient with the high requirement would be expected to use 33mg less, and the low requirement patient 3mg less. Using 900mg of gabapentin instead would have changed the morphine reductions to 34mg and 4mg. Gabapentin works as a co-analgesic, but either the dose response is very shallow or the dose effect rapidly flattens off at doses over 300mg. The trouble is reliably knowing which patients are going to need the high doses of morphine. The type of surgery seemed to have relatively little influence on the gabapentin effect. Gabapentin was also associated with lower pain scores, especially in the first few hours of surgery. Other gains were less nausea and vomiting, and less anxiety. The trade-off was greater sedation.

Reference: Anaesthesia 2015;70(10):1186–204

Merry Christmas and a healthy, happy 2016! FROM THE TEAM AT RESEARCH REVIEW

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Dr Pranesh Jogia and Dr Daniel Lovric review levosimendan (Simdax®). This review discusses the evidence in support of the use of levosimendan (Simdax®) in the treatment of acute heart failure and a range of other settings where positive inotropic therapy is required.

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Anesthesia and Preinduction Checklist to Improve Information Exchange, Knowledge of Critical Information, Perception of Safety, and Possibly Perception of Teamwork in Anesthesia Teams

Authors: Tscholl DW et al.

Summary: In this research, compared with 100 anesthesia teams not using an anesthesia preinduction checklist, 105 teams that did performed significantly better for information exchange (100% vs. 33% [p<0.001]), critical information knowledge (100% vs. 90% [p<0.001]), perception of safety (91% vs. 84% [p<0.001]), and perception of teamwork (90% vs. 86% [p=0.028]), but not clinical performance (93% vs. 93% [p=0.60]).

Comment: Anaesthetists vary quite markedly in their styles of communication and the information exchanged with the rest of the anesthesia team immediately before induction. This Swiss study compared anesthesia teams using a formal preanaesthesia checklist with teams just following their normal routines. The information exchange at each induction was scored by a trained independent observer. Also team members understanding about the style of induction and knowledge of the patient's essential clinical details were self-scored after induction. The results demonstrated higher quality information exchange when the checklist was used, better knowledge of the patients' essential details and the teams subjectively safer, but this did not translate into positive change in the study measures of clinical performance. In the discussion, this lack of impact on clinical performance was attributed to the high level of clinical performance that existed before the study commenced due to previous research and the associated closed communication loops. There is convincing evidence that checklists improve safety, but the finer detail about when to check what remains unclear, and likely will depend on the hospital theatre culture and perhaps the surgical specialty. In Australia and NZ some of this study's checklist items would be included in team briefings, preoperative check-in processes and timeout, so this research would not simply generalise to our theatres. The major point of difference was formalising communication within the anesthesia team during the induction sequence. This may mean that the anaesthetist becomes less connected with the patient because of the need to engage with the checklist process and the associated closed communication loops. Would patients find this off-putting or would they feel reassured? Using this checklist would make it unlikely that anesthesia would progress for the first 10 or 15 min of an operation with the blood pressure cuff inadvertently left on manual or the ECG leads left swapped around. The study produced one illustrative incident in the control group that should have been caught had the checklist been used – a patient pre-oxygenated with vapouriser left on accidently. Potentially more critical events would be prevented either directly through the checklist or indirectly through the effect of the checklist on the safety culture in theatre.


Appropriate Dose of Dexmedetomidine for the Prevention of Emergence Agitation After Desflurane Anesthesia for Tonsillectomy or Adenoidectomy in Children: Up and Down Sequential Allocation

Authors: Kim H-S et al.

Summary: Twenty-one unpremedicated children scheduled for tonsillectomy or adenoidectomy received general anesthesia induction with sevoflurane and oxygen, and presurgery they received dexmedetomidine, with the dose determined by the previous participant’s response using 0.1 µg/kg increments/decrements; anesthesia was maintained with desflurane. Emergence agitation (≥1 measurement at level ≥4) was assessed on arrival in the postanaesthesia care unit, 15 minutes later and 30 minutes later. The respective 50% and 95% effective dexmedetomidine doses for preventing emergence agitation were 0.25 and 0.38 µg/kg.

Comment: Sequential up-down analysis is a quick and dirty way of identifying an “ideal” dose. The total number of patients in this study was only 21. The decision to increase or decrease the dexmedetomidine dose for the current patient was based on whether the prior patient had experienced emergence delirium. No other factors were taken into account like the prior patient’s pain levels, blood pressure or heart rate. No subjects suffered significant hypotension, bradycardia or extended periods of sedation. The dose identified to reduce the incidence of emergence delirium to 5% was 0.36 µg/kg. Higher doses are commonly used in clinical practice. As the authors stated, further work is needed now to validate the dose identified. Looking at the study protocol – IV line placed the day before surgery, no premedication, thiopentone and atropine induction, sevoflurane to deepen, paralysed and intubated, desflurane maintenance, cobra surgery technique with local anaesthetic infiltration of tonsillar tissue, no opioids, NSADs or paracetamol (acetaminophen) in theatre, exublated light – there are numerous features that may or may not have had a bearing on the incidence of emergence agitation and the “ideal” dose of dexmedetomidine. Perhaps the take home message is the potential to use a sequential up-down protocol to refine aspects of practice in your institution. Once a department has a relatively standardised approach to anesthesia and surgery for a common procedure like tonsillectomy, it should be relatively straightforward to recruit 20 or 30 patients to optimise an aspect of the care. In the hospital I work we are probably still a little way off the required level of standardisation.


Liberal Transfusion Strategy Improves Survival in Perioperative but Not in Critically Ill Patients

Authors: Fominsky E et al.

Summary: This was a meta-analysis of RCTs performed in perioperative or critically ill adults receiving restrictive versus liberal transfusion strategies and reporting all-cause mortality. For 17 RCTs (n=7552), a liberal transfusion strategy in the perioperative period was associated with a lower risk of death from any cause than a restrictive strategy (OR 0.81 [95% CI 0.66, 1.00; number needed to treat, 97), but no difference was seen among 3469 critically ill patients from ten RCTs (1.10 [0.99, 1.25]).

Comment: “Our findings are different from those of five previously published meta-analyses.” This quote from the discussion section seemed like the perfect start for a commentary. There is a natural tendency to go from the title to the conclusions, and in doing so fail to recognise the evolutionary nature of the evidence that each meta-analysis is built on. The results of this study are strongly influenced by three RCTs published earlier in 2015 (accounting for 46.3% of the total study weightings in the perioperative setting). In each of these studies there was a higher mortality rate in the restricted transfusion group. There are a number of confounders making it dubious to apply data generated 15–20 years ago directly to contemporary practice. For instance, the routine use of leucocyte depleting filters, massive transfusion protocols, active point-of-care testing of coagulation, cell-salvage and aggressive management of preoperative anaemia all contribute to the relative safety and efficiency of blood transfusion. Just hidden from view is the other axis label for a two-dimensional transfusion trigger. One axis is clearly the haemoglobin level, but what is the overall measure of critical unwellness to put on the other axis to generate the next study protocol? For the clinician in theatre, there is some reassurance that if you transfuse to over 90 when aiming for the 80s you probably have not done the patient any harm, in fact there is a fair chance the patient is better off with the higher haemoglobin level. For the intensivist there is just further cause to worry.


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Abstract

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