Received Date : 17-Nov-2015

Accepted Date : 23-Nov-2015

Article type : Editorial

Title:

Bundled analgesia interventions for day-stay surgery

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Invited editorial

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This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/pan.12833](#)

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The article by Walther-Larsen et al in this month's journal¹ examines the benefit of simultaneously implementing a number of recommendations² as a structured intervention to improve pain management in children and adolescents after day-surgery. One could go further and call it a "tailored" structured intervention as after discussion with parents, they prescribed paracetamol and ibuprofen in a formulation, and by the route of administration most suited to the child.

The interventions chosen were feasible, inexpensive and easily applied. They included around-the-clock (ATC) dosing, parent education and written information regarding pain assessment and analgesic dosing recommendations. Notably, they dispensed acetaminophen and ibuprofen to the parents to take home with a regimen dependent on the surgical procedure.

Compliance with ATC acetaminophen administration was an impressive 97% on the first postoperative day. It is difficult to tease out which intervention(s) mattered most given the "bundled" delivery and this may need further exploration. Some such as ATC dosing need further attention. Do parents really need to wake in the early hours to administer their sleepy / grumpy child 6-hourly acetaminophen or can it be given just prior to bed even though only 4 hours have passed since the last dose and 8h may pass before the next?

Reducing the burden of analgesia administration may also result in improved compliance with dosing schedules, better sleep for children and their parents and as effective analgesia. Acetaminophen for example is commercially available for adults as a prolonged duration administered tds (1330mg tds vs 1000mg qid). NSAID alternatives to ibuprofen such as naproxen, meloxicam or celecoxib require only once or twice daily administration, although some of these are not currently commercially available in child-friendly formulations in many countries.

Procedure specific pain profiling at different ages (to differentiate developmental stages that may be important such as ability to sit, crawl or walk and cognition ie the child being aware they underwent surgery) would facilitate better-informed advice for parents regarding how long ATC dosing should be continued. Walther-Larsen et al advised ATC dosing for the first 24h postoperatively regardless of procedure; almost half of children underwent orchidopexy. Previous studies have shown that pain and functional limitation after orchidopexy persists longer than 24h and that they may benefit from ATC dosing for longer.³ On the other hand, children may not require ATC dosing for 24h after some surgeries. Looking forward, estimating the NNT vs NNH for prn vs ATC dosing at key time points after certain surgical procedures may be useful. For example, at present we have only very sparse information for estimating whether the frequency of gastropathy, nephropathy or other adverse effects from NSAIDs would differ between a prn versus ATC regimen over 2 days postoperatively.

Whilst postoperative pain scores were mostly low, the two times chosen to measure pain were perhaps not truly reflective of the child's overall pain experience as on day 0, their regional block would have still been effective and assessing pain once more the following morning may not adequately reflect their pain experience with ambulation thereafter. When assessing adequacy of analgesic regimens, sufficient follow-up is required that ideally would include pain assessment with activity. Furthermore, several parents reported high pain scores at both measured time points highlighting the need to identify after which procedures children may also benefit from a few doses of rescue opioid analgesia to take home too.

The current study showed remarkably good adherence and acceptance of oral analgesic dosing in children undergoing surgeries with generally mild-moderate, rather than severe, pain. It remains to be demonstrated whether a similar structured approach would be similarly effective for a more challenging situation, namely tonsillectomy.² Tonsillectomy poses additional challenges: the pain is more severe, and the act of swallowing analgesic medications is painful. If NSAIDs are permitted, an ATC approach involving acetaminophen-NSAID appears feasible. If NSAIDs are avoided, acetaminophen alone is insufficient for analgesia, and a strictly scheduled ATC approach involving opioids may be potentially risky and ill-advised, given the altered ventilatory control that persists after tonsillectomy.⁴

There is also scope for further examining what parent / child education is comprised of, when and how it is delivered and by whom. More effective analgesia may require tailoring analgesia advice and resource provision according to cultural factors, parental (computer) literacy and internet access. Individual parent/child education requires considerable time for each nurse. Some parents may be in a good frame of mind to process this information in the PACU, others may not. For some parents, videos, web-based instructions, or apps reviewed pre-operatively may be ideal, and then postoperative instructions with the nurse in the PACU can serve as more of a reminder. Electronic instructions in multiple languages may be ideal for pediatric centers with families speaking multiple languages. There may be roles for automated app-based reminders as well. Along with education of parents, there may be a role for age-appropriate apps directed at children explaining why taking medications after surgery will help them feel better.

Future studies should pay closer attention to utilising validated pain scores that may include self-report for older children (rather than parental NRS when the median age was 7y) and PPPM that is validated in children 2-12 y of age. Greater emphasis should be placed to measuring improvement in pain-related outcomes that are important for children and their parents. These could include reducing the prevalence and duration of postoperative behavioural disturbance, the need for health care consultations following discharge after tonsillectomy and depending on the surgery, the time to normal preoperative functioning with regards mobility, sleeping, eating and drinking.^{3,5,6} With some studies suggesting gender differences with pain perception, it would be useful to include more females (over 90% were male in this paper).

Walther-Larsen et al should be applauded for examining their institution's practice, identifying and implementing simple and intuitive changes based on current recommendations. Whilst no clear improvement in analgesia was demonstrated, high initial compliance with the prescribed postoperative analgesia dosing schedule is an encouraging sign that this is an area for further research.

Acknowledgements:

Prof Berde: Sara Page Mayo Endowment for Pediatric Pain Research and Education

Disclosures:

Prof Berde, his collaborators, and Boston Children's Hospital have issued patents, a collaboration agreement with Proteus SA (Santiago, Chile), and a licensure and development agreement for neosaxitoxin as a prolonged duration local anesthetic with Gruenenthal GmbH, a pharmaceutical company (Aachen, Germany). In the event of future progress in clinical trials and commercial development, Dr. Berde, his collaborators, and Boston Children's Hospital could receive milestone payments and royalties.

A/Prof Chalkiadis: nil

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Title:

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Date:

2016-02-01

Citation:

Chalkiadis, G. A. & Berde, C. (2016). Bundled analgesia interventions for day-stay surgery. PEDIATRIC ANESTHESIA, 26 (2), pp.120-121. <https://doi.org/10.1111/pan.12833>.

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