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CORRESPONDENCE

WILEY Pediatric Anesthesia

ESPA pain management ladder: Caudal clonidine and cost/benefit considerations

Sir,

We read with interest the work by Vittinghoff et al[1] on the creation of guidelines for postoperative pain management in children which aims to "guide best practice" through expert consensus. The creation of a framework for improvement is laudable and may prove useful to lower resource institutions as they seek to maximize the patient benefit obtained from any increase in funding. Improving patient outcomes is the essence of medicine. However, analgesia, while important, must always be weighed against patient safety. We have previously reported severe adverse events with the use of epidural clonidine in young infants in this very journal. The safety of caudal clonidine in infants remains unproven.[2] Vittinghoff et al recommend its routine use in pyloromyotomy, a disease of infancy that itself may carry apnea risks due to metabolic alkalosis. Upon rereview of the literature, we were unable to find retrospective or prospective data supporting epidural clonidine in infants <6 months old. With multiple reports of harm and no proposed benefit apart from prolonged analgesia, we feel that caudal clonidine is inappropriate in patients under 6 months of age and especially for those at risk for apnea. For over a decade, these risks have been raised repeatedly, and the burden of proof is on those who recommend it to demonstrate its safety prior to its recommendation for widespread use. These guidelines should therefore be immediately amended, along with the removal of the recommendation for routine intraoperative opioid use.

Similarly, these guidelines propose a ladder whereby more expensive medications and technologies, such as intravenous acetaminophen or ultrasound-guided regional anesthesia, are assigned to higher rungs thus suggesting better outcomes. However, for many of the examples given, available data do not support improved analgesic efficacy with higher rungs compared to lower rungs. For example, for pyloromyotomy, we are not aware of any data demonstrating improved outcomes with rectus sheath block as compared to caudal analgesia. Similarly, for circumcision, recent data published in this very journal show no difference in outcome with ultrasound-guided penile block as compared to a landmark-based approach. In addition, while clonidine increases the duration of epidural analgesia, its efficacy in peripheral nerve blocks has not yet been well demonstrated.[3] All elements on this ladder should aspire to elevate patients to higher levels of analgesia and safety. As it currently stands, several of the regional anesthetic recommendations in this ladder are not evidence-based, occasionally indicate increased complexity and cost without benefit to the patient, and ignore the suggestion that earlier use of ultrasound, if available, may be beneficial in the pediatric population given the evidence that use of ultrasound increases block success and duration while decreasing the risk of vascular puncture and local anesthetic systemic toxicity for certain regional blocks in adults.[4] We therefore propose that the level of evidence for each recommendation should be added to this manuscript.

In closing, we would also caution against promoting the description of pain as "The Fifth Vital Sign." In the United States, experts suggest that this campaign may have unintentionally directly contributed to the current opioid epidemic by promoting administration of opioids in hospitals and prescription of opioids after discharge, and thus, this designation is no longer supported by the American Medical Association, the American College of Surgeons, the American Academy of Family Physicians, The Joint Commission, and the Centers for Medicare and Medicaid.[5]

DISCLOSURES

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Intraoperative antibiotic redosing compliance and the extended postoperative recovery period: Often overlooked areas that may reduce surgical site infections

Sir,

It was with great interest that we read *Compliance with perioperative prophylaxis guidelines and the use of novel outcome measures* by Morse, et al[1] The authors should be applauded for presenting a well-balanced review of the rationale behind the use of prophylactic antibiotics, data supporting dosing intervals, and potential outcome measures. There are two topics that have been historically understudied and deserve greater attention: intraoperative redosing guidelines and measures of compliance, and additional factors beyond prophylactic antibiotics that may contribute to surgical site infections (SSIs).

As part of the Surgical Care Improvement Project (SCIP), and as stated in Morse's review, institutions routinely report compliance of prophylactic antibiotic administered within 60 minutes of incision (some exceptions apply).[1,2] However, procedure length is an independent risk factor for developing SSIs.[3] Maintaining adequate inhibitory antimicrobial plasma and tissue levels during surgery depends not just on the initial dose but also on subsequent redosing.[1,4] The Centers for Disease Control (CDC), the Infectious Disease Society of America (IDSA), and the American Society of Health-System Pharmacists (AHSP) recommend redosing when the procedure length exceeds one to two half-lives of the antibiotic.[4] But, there are no standard guidelines for reporting redose compliance, unlike the SCIP measures that include first dose compliance.[2] Given the risk of SSI morbidity and that procedure length is an independent risk factor for SSI development, we believe monitoring of redosing compliance should be a routine component of an institution's SSI reduction bundle.[3]

Cefazolin is the most commonly administered pre-incision prophylactic antibiotic. Given its prevalence and the importance of redosing, we challenge the convention of redosing cefazolin every 4 hours, as cited in Morse's review as the recommendation from the AHSP.[1,4] The recommended redosing guidelines from the CDC, AHSP, and IDSA are to redose antibiotics every two half-lives.[4] Given that the half-life of cefazolin is reported to vary from 1.2 to 2.2 hours under non-blood loss settings, we redose cefazolin every 3 hours.[4] Indeed, Figure 1 of Morse's article demonstrates the concentration of cefazolin falling below the minimum inhibitory concentration prior to 4 hours.[1] Perhaps not surprisingly, SSIs are more common in surgeries lasting greater than 3 hours when a single dose of cefazolin is used.[4]

Finally, it is common for SSIs and perioperative antibiotics to be discussed in tandem since antibiotics have been convincingly shown to reduce the risk of SSIs.[4] However, the National Healthcare Safety Network (NHSN) requires reporting of infections up to 30 days postoperatively. The CDC recommendations guide the pre-, intra-, and the immediate postoperative care period, but the extended care of postoperative patients, such as postoperative days 10 through 30, lack specific SSI reduction guidelines. Attention should be given to not just if a SSI developed, but on which postoperative day. Beyond quality improvement projects to optimize perioperative antimicrobial use, extended care SSI reduction bundles that focus on wound care and patient hygiene should be considered. In a recent report, a sustained 70% reduction in SSIs was demonstrated after the implementation of an extended care SSI reduction bundle in pediatric cardiac patients.[5]

Prophylactic antibiotics are a major contributor to reducing the risk of SSIs. However, the importance of optimal intraoperative redosing should not be overlooked in the context of SSI reduction. Institutions that already have reliable adherence to perioperative antimicrobial guidelines yet seek to further reduce SSIs should consider investigating postoperative extended care bundles.

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