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Suboptimal Protocol?

To the Editor:

Park *et al.*¹ compared surgical pleth index (SPI)-guided analgesia with conventional analgesia during adenotonsillectomy in 45 pediatric patients. The authors confirmed their primary outcome that intraoperative fentanyl requirements are lower in SPI-guided patients. However, they failed to confirm any secondary outcomes, instead showing that intraoperative sevoflurane consumption, emergence agitation, pain, and analgesic requirements were all aggravated in SPI-guided patients. The authors concluded that SPI may not be valid in children.

I congratulate the authors for carefully blinding study personnel, which surely promoted accurate results. However, I am concerned by the authors' analgesic protocol. Adenotonsillectomy is a short and painful procedure, in this case, averaging only 25 to 30 min of anesthesia and just 15 to 18 min of surgery.

Given the authors' protocol for analgesic administration, it seems likely that patients in both groups were undertreated. No analgesics were given before incision; moreover, the protocol mandated analgesic administration only after SPI increased to at least 50 or an increase in blood pressure or heart rate to at least 120% for a minimum period of 3 min for the initial event and 5 min for subsequent events. This seems a remarkably long cycle time for such a short operation. Many clinicians would argue that participating patients should have been preemptively treated and that a shorter cycle period would be appropriate.

Patients in the SPI-guided group were, on average, given just a single 0.5- μ g/kg bolus of fentanyl (average total dose only 0.4 μ g/kg). Patients in the control group were given approximately three boluses (average total fentanyl dose of 1.7 μ g/kg). A more typical preincision loading dose would be 1 to 3 μ g/kg fentanyl for adenotonsillectomy if fentanyl is used as single agent for analgesic treatment both intraoperatively and postoperatively.^{2–4} A consequence of avoiding preemptive analgesia and a protocol-mandated long cycle

time is that at least some patients may never have reached analgesic equilibrium—thus not truly testing the efficacy of SPI guidance. The high incidence of tachycardia events in both study groups (67%, no difference between groups) is consistent with this theory. Given what appears to be inadequate analgesic administration, it is perhaps unsurprising that patients in both groups were suffering and agitated in the postanesthesia care unit.

The results reported by Park *et al.* are presented as a failure to validate SPI in children but instead appears to be a predictable consequence of their protocol. Thus, whether SPI is helpful in children remains unanswered.

Competing Interests

The author is a consultant at Medasense Ltd. (Ramat Yishai, Israel), a company currently developing a nociception monitor based on the Nociception Level index. The author receives a consultant fee and has company option shares.

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In Reply:

The efficacy of surgical pleth index (SPI) to guide the nociception–antinociception balance has been proven in study settings during general anesthesia rather than before anesthesia induction or during emergence from anesthesia. Considering that SPI only works well in anesthetized patients¹ and that operation time of adenotonsillectomy is usually short, the authors have designed the analgesic protocol of this study without preemptive analgesia so as to adequately verify the efficacy of SPI in children undergoing the surgery under general anesthesia. Preemptive analgesia given in a short procedure may provide over the necessary amount of