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Editorial

Perspectives on Post-Craniotomy Analgesia in Pediatric Patients: Looking Back and Moving Forward

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Case Report

Bronco et al addressed the issue of an under-investigated niche in pediatric pain research-The post craniotomy child [1]. Assessing pain intensity in the pediatric population confers inherent limitations, and this study conscientiously employed the most appropriate pain rating scales for each demographic. While there is no current consensus on optimal analgesic therapy, it remains important to consider what additional challenges and limitations craniotomy interventions impose on the selection of analgesic agents in this population. We bring to light some regional practice considerations (Europe V. United States) and offer a brief account of alternative analgesic strategies that may be of utility in the postoperative neurosurgical patient.

Bronco et al noted that out of 212 patients enrolled, 83% of patients received IV paracetamol (acetaminophen) in the postoperative period with the remaining 17% given rectal paracetamol [1]. Acetaminophen, a centrally acting analgesic, has been shown to reduce opioid requirements up to 50% [2]. Intravenous formulations afford the pharmacokinetic advantage of bypassing first-pass metabolism in the liver and thus achieving effective, predictable plasma concentrations while minimizing hepatic burden [3]. In the US, IV acetaminophen is more expensive than oral and rectal forms due to lack of a generic formulation. As a result, use of IV acetaminophen is often limited or restricted by hospital formularies with the rationale that oral and rectal forms are far cheaper with similar efficacy. Rectal acetaminophen has been shown to provide poor, unpredictable bioavailability-either leading to subtherapeutic plasma concentrations or requiring greater doses that increase the risk of toxicity [3]. The responsibility may fall on us to advocate for IV acetaminophen in the early post-operative period.

Multimodal analgesic strategies confer several advantages over oligomodal analgesia. In the post craniotomy patient, analgesia should be tailored to preserve the neurological exam and minimize the risk of post-operative complications. Overreliance on opioid-based pain management may result in hypoventilation, carboxemia, acidosis, and resultant increases in intracranial pressure. The aforementioned side effects/toxicities may alter level of consciousness, motor activity, and pupillary response thereby hampering the ability to detect true sequelae of surgery [4]. Thus, pain control in these patients represents a balancing act. On one hand, we risk gratuitous pain with subtherapeutic analgesia; on the other hand therapeutic analgesia may mask a deteriorating patient. To meet this challenge we advocate the adjunctive use of non-opiod medications (in conjunction with opiates) in the early post-operative period. Similar to acetaminophen, alpha-2 agonists such as dexmedetomidine also potentiate the analgesic effects of opiates without affecting respiratory drive and pupillary response [2]. FDA warnings regarding codeine use are also reiterated due to individual variability in metabolism of this prodrug that can lead to supratherapeutic plasma concentrations of the active metabolite [2,4]. Parenteral morphine use with transition to oxycodone when oral intake is tolerated can help decrease some of the undesired effects, since the concern for bleeding in the immediate postoperative period sometimes limits the use of nonselective Nonsteroidal Anti-inflammatory Drugs (NSAID) or Cyclooxygenase (COX) inhibitors.

As we continue to challenge the frontiers of pediatric pain control, future investigations will enable us to advance and expand the targets for multimodal therapy with optimal benefits and decreased side effect profiles. Pediatric pain control presents a unique set of challenges; postoperative analgesic strategy is thus tailored to both the patient population and the procedure performed.

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