A Rather Expensive Band Aid: Intravenous Acetaminophen is Associated With Increased Need for Recovery Room Pain Treatment Following Pediatric Ambulatory ENT Surgery

S. Dupler DO, A. Baetzel MD, K. Yang MD, A. Thompson MS, D. Wagner PharmD, O. Nafiu MD FRCA MS
University of Michigan Health System, Department of Pediatric Anesthesiology

**BACKGROUND**

Forty percent of pediatric ambulatory surgeries performed in the U.S. are ENT procedures.1 Sleep disordered breathing (SDB) is highly prevalent in this patient population. To decrease the potential risk and morbidity associated with opioid use among these patients, multimodal analgesia including the use of non-opioidoids such as intravenous acetaminophen (IVA) has received substantial attention as a method to reduce total perioperative opioid dose while providing adequate analgesia. However, IVA use in the pediatric perioperative setting has produced mixed results.2-5 and no prior studies have critically examined its role in reducing PACU pain and need for opioid intervention.

**HYPOTHESIS**

• Intraoperative IVA use is independently associated with an increased need for PACU analgesic intervention (opioid or non-opioid) and an increased mean first arousal pain score in a cross-sectional sample of children who underwent elective ambulatory ENT procedures.

**METHODS**

• DESIGN, SETTING AND PARTICIPANTS: Prospective, observational design.

• Children aged 4-17 years (N=358) who underwent elective, ambulatory ENT operations were stratified into two groups:

  1. Patients who received intraoperative opioid and IVA were classified as cases.

  2. Patients who received intraoperative opioid only (no IVA) were controls.

• Patients were enrolled on randomly selected weekdays during the pre-op interview.

• Outpatient ENT operations included identifed by the intraoperative administration of intravenous analgesia (opioid or non-opioid) and/or use of intraoperative local anesthetic infiltration.

• All perioperative interventions (including decision to use IVA and choice and dose of intraoperative opioids) were at the discretion of the anesthesia caregivers.

• Exclusion criteria: Patients with chronic pain disorders, those with no prior studies have critically examined its role in reducing PACU pain and need for opioid intervention.

• PRIMARY: difference in administration of PACU opioid analgesia.

• SECONDARY: (1) first arousal PACU pain score measured on the numeric rating scale (0-10) on the FLACC within 15 minutes of PACU admission and (2) PACU length of stay.

**RESULTS**

• The degree to which intraoperative IVA use independently predicted PACU IV opioid administration was examined in a multivariable logistic regression model adjusted for age (as a continuous variable), duration of surgery (minutes), intraoperative morphine equivalents/kg, as well as female gender, ASA status, history of SDB, and first arousal pain score. Model diagnostic parameters as well as the adjusted odds ratios are included in Table 1.

• After adjusting for the other covariates, those with intraoperative IVA were 2.4 times as likely to have PACU IV opioid administration than those with intraoperative opioid use only (AOR: 2.42, 95% CI: 1.2, 4.9; p = 0.015).

• Expectedly, first recorded arousal pain score was also a significant predictor of PACU IV opioid requirement (AOR=1.47, 95%CI = 1.33, 1.63; p<0.001).

• The other predictors in the model were not statistically significant.

**DISCUSSION**

• IVA administration did not decrease PACU pain intervention in pediatric patients undergoing ambulatory ENT procedures.

• To the contrary, after adjusting for covariates, children who received intraoperative IVA were 2.4 times more likely to receive PACU IV opioids than controls and had higher first recorded arousal pain scores.

• Interestingly, patients who received IVA utilized less intraoperative opioids compared to those who did not receive IVA (IVA-no 0.08 ± 0.07 vs IV-A yes 0.05 ± 0.05, p<0.001).

• One reason for this may be that clinical concerns for postoperative adverse respiratory events may lead anesthesia practitioners to decrease intra-op opioids with the intention of utilizing a multimodal analgesic strategy that includes intraoperative IVA instead. Perhaps by overestimating the analgesic properties of IVA.

• Intra-op use of IVA did not yield lasting postoperative pain relief and instead resulted in an increased risk of moderate to severe pain in the immediate postoperative period.

• Our results suggest that intraoperative IVA use merely delayed opioid administration from the intra-op period to the PACU period, rather than decreasing overall opioid use.

• Patients who received IVA had no difference in PONV, thus suggesting that their increased PACU length of stay could have been more related to pain control issues, but further studies are necessary.

**CONCLUSION**

Our study suggests that utilizing intra-op IVA as part of a multimodal analgesic regimen in pediatric patients undergoing outpatient ENT procedures does not decrease immediate post-operative opioid requirements and puts patients at higher risk for opioid analgesic intervention in the PACU.

• The other predictors in the model were not statistically significant.

---

**REFERENCES**


