Opioid analgesics are a primary source of adverse drug events (ADE) contributing to serious preventable harm for hospitalized adults and children. Since risk stratification approaches have not, to date, reliably differentiated patients who will deteriorate from those who will not, investigators suggest that early detection of opioid-related ADEs must rely on comprehensive risk-reduction strategies, including use of multimodal analgesia. A report from the Anesthesia Patient Safety Foundation (APSF) has stated that risk stratification is necessary but insufficient to eradicate opioid-ADEs, and called for research regarding surveillance strategies.

Hypothesis: Early adjuvant use of non-opioids would reduce the risk of serious opioid-ADEs and need for rescue postoperatively.

Methods

• IRB approval with waiver of consent was obtained for this nested case-control study
• Children ≥ 20 yrs who underwent general anesthesia were included
• Cases included children with serious adverse opioid drug events (over-sedation, respiratory depression) identified from the RRT, CPA and pharmacy naloxone databases
• Controls were randomly selected from procedure matched groups in the base population in the perioperative electronic database over the same period
• Data included: demographics, medical history, ASA, procedure, opioid and adjuvant doses, VS, sedation scores and SpO2 over first 48 hours postoperatively
• Adverse events and interventions were identified using a structured trigger tool, and reviewed by 3 investigators to ensure consensus and reliability of review.

Results

• 25 children with opioid-ADEs and 98 children without events are described in Table 1.
• Use of adjuvant non-opioids remained an independent risk reduction factor for both opioid-ADEs and need for rescue when controlled for risk factors (Table 2).
• Supplemental oxygen use at PACU discharge and in the hours prior to the event was associated with an increased odds of opioid-ADEs (Table 3).
• Children who needed rescue had a significantly lower SpO2 in the 12 hours prior to the event compared to the threshold group (86.56±8.2 vs. 93.67±3.91; p=0.008), and compared to all others, were more likely to have needed O2 at PACU DC (OR 5.5 [1.7, 17.82]; p=0.002) and pre-event (27.86 [7.04, 110.28] p=0.001).

Conclusions

• Findings suggest that use of multimodal analgesia reduces the odds of serious opioid-ADEs in hospitalized children postoperatively.
• Enhanced vigilance and clinical assessments are also critical to ensure early and effective intervention and prevent failure to rescue from opioid-ADEs, particularly when supplemental O2 is in use.
• A multidisciplinary approach to ensure the translation of these risk mitigation strategies into practice is warranted to ensure that no child is harmed by opioid-induced adverse effects.

References

1. Holdsworth MS. Arch Pediatr Adolesc Med 2003;157:00

Early Adjuvant use of Non-opioids Associated with Reduced Odds of Serious Postoperative Opioid Adverse Events and Need for Rescue in Children

Terri Voepel-Lewis, MS, RN, Deborah Wagner, PharmD, Alan R. Tait, PhD, Constance Burke, BSN, Jennifer Hemberg, BS, Elsa Pechlivanidis, BS, Shobha Malviya, MD, AkkeNeel Talsma, PhD, RN, FAAN

University of Michigan, Ann Arbor, MI