Introduction

Epidural anesthesia is an effective way to provide postoperative pain control for major thoracic and abdominal surgery. Benefits including decreased anesthetic exposure and postoperative analgesia are particularly desirable in infants given their sensitivity to opioid-related respiratory depression, negative long-term sequelae of poor pain control, and concern for anesthetic-related neurotoxicity.

Regional techniques can be technically challenging in infants and newborns. Serious complications are rare but potentially devastating. Limited data exist to guide this complex risk-benefit analysis.

Study Design

Retrospective cohort study of infants <12 months old having major abdominal surgery between 11/2011-11/2014. IRB approval was obtained. Infants who were intubated prior to surgery were excluded.

Descriptive statistics: epidural and non-epidural groups were compared using Fisher’s exact and t-test. Logistic regression was adjusted for age and surgery type.

Primary outcomes: intraoperative opioid administration and mean end-tidal sevoflurane.

Secondary outcomes: morphine equivalents administered in 0-24 and 24-48 hours postoperatively, pain scores (NPASS). Epidural complications were described.

Hypothesis

Infants with epidural catheters for major abdominal surgery have 1) decreased intraoperative anesthetic requirements, and 2) better post-operative analgesia compared to opioid analgesia alone.

Results

**Epidural vs. opioid analgesia for infants undergoing major abdominal surgery: A retrospective review**

Lizabeth D. Martin MD, Trevor Adams MD, Laura Duling MD, Eliot Grigg MD, Nancy Gove PhD, Adrian Bosenberg FFA, Nathalia Jimenez, MD, MPH

1Department of Anesthesiology & Pain Medicine, University Washington, Seattle Children’s Hospital, Seattle, WA

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**Results**

<table>
<thead>
<tr>
<th>Epidural</th>
<th>Postop Epidural vs Morphine Equivalent by Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Day 1: Median Blue = Mean</td>
</tr>
<tr>
<td>No</td>
<td>Day 2: Median Blue = Mean</td>
</tr>
</tbody>
</table>

**Discussion**

- Epidural patients were 56 days older and less likely emergent (23% vs 63%, p<0.001).
- Intraoperative opioid exposure was less with epidurals: Fentanyl 3.3 vs 6.2 mcg/kg (p<0.001), morphine given in 6% vs 26% (p=0.04).
- Morphine equivalents for 0-24 hours was less with epidurals (0.24 vs 0.34 mcg/kg), although not statistically significant (p=0.36).
- NPASS sedation scores < 0 were recorded for 13% of the epidural group vs 30% of the non-epidural group, 2 with extreme sedation (NPASS <-5).

**References**

- Sun L. Early childhood anesthesia exposure and neurocognitive development. JAA 2010;105: 7
- Vutskits. More than Anyone Else Preemies Need Good Analgesia. Anesthesiology April 2016 124

**Discussion**

- Epidurals significantly decrease intraoperative opioid requirements.
- Epidural placement does not preclude postoperative opioid exposure. Particularly in this age group, opioids are used according to comfort protocols and not exclusively to treat pain.
- NPASS scores are variable regardless of analgesic strategy. Patients with epidurals may have less sedation.
- Epidural use in infants is safe and feasible.
- Prospective evaluation in this age group may better compare sevoflurane exposure with and without epidurals.