Perioperative Antibiotic Exposure and Postoperative Bleeding after Tonsillectomy

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Background
• >500,000 tonsillectomies performed annually in the US
• Bleeding is the most feared complication
• 2010 Cochrane review found no benefit from perioperative antibiotics
• 2011 American Academy of Otolaryngology – Head and Neck Surgery practice guideline recommends against antibiotic use
• Recent single center study showed decreased antibiotic use and a small but significant increase in surgery for bleeding following publication of the guideline

Objective
• To determine if antibiotic use was associated with postoperative bleeding across children’s hospitals

Methods
DATA SOURCE
• The Pediatric Health Information System, a database of freestanding children’s hospitals, was used
• 34 hospitals included in the analysis

INCLUSION/EXCLUSION CRITERIA
• Inclusion : Patients >1 and <19 years old with tonsillectomy between 2009 and 2013
• Exclusion: Patients with high risk conditions, additional surgery, or admission from the emergency department

EXPOSURE/OUTCOME DEFINITIONS
• Exposure: billing charge for antibiotics on day of surgery
• Outcome: revisit for bleeding, vomiting and dehydration, or pain within 30 days, identified by ICD9 codes

ANALYSIS
• Fit a logistic regression model which included patient demographics, comorbid conditions, indication, year, hospital, and dexamethasone use
• Used marginal standardization to obtain risks and risk differences

Results
• 107,707 patient met inclusion criteria
• 19,141 (18%) received antibiotics
• 3,438 (3.2%) had a visit related to bleeding within 30 days
• 1,453 (1.3%) required surgery for bleeding
• 1,027 (1.0%) had a visit to the ED related to bleeding
• 1,495 (1.4%) had a visit to the ED for dehydration/vomiting

Conclusions
• Use of perioperative antibiotics did not impact risk for bleeding after pediatric tonsillectomy in this large, multi-center trial
• With approximately 90,000 patients/year receiving perioperative antibiotics for this surgery, this is a potential target for antimicrobial stewardship efforts
• There was a small but significant decrease in ED visits for pain and dehydration in patients receiving antibiotics
• NNT to prevent visit for pain = 404
• NNT to prevent visit for dehydration = 274

Table 1. Risk of revisit in 30-days after tonsillectomy, by antibiotic exposure

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Risk per 100 patients</th>
<th>Risk Difference</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Bleeding</td>
<td></td>
<td></td>
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<tr>
<td>Any revisit¹</td>
<td>3.08 (2.80-3.37)</td>
<td>3.21 (3.10-3.33)</td>
<td>-0.13 (-0.46, 0.2)</td>
</tr>
<tr>
<td>Procedure</td>
<td>1.26 (1.08-1.44)</td>
<td>1.31 (1.23-1.38)</td>
<td>-0.05 (-0.26, 0.16)</td>
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<tr>
<td>ED revisit</td>
<td>1.15 (0.96-1.35)</td>
<td>1.00 (0.94-1.07)</td>
<td>0.15 (-0.06, 0.36)</td>
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<td>Dehydration, revisit to ED</td>
<td>1.07 (0.9-1.24)</td>
<td>1.44 (1.36-1.51)</td>
<td>-0.37 (-0.57, -0.16)</td>
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<tr>
<td>Pain, revisit to ED</td>
<td>0.74 (0.58-0.89)</td>
<td>0.98 (0.92-1.05)</td>
<td>-0.25 (-0.43, -0.07)</td>
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¹Includes inpatient (admission and surgery) and emergency department

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