There is insufficient evidence to draw a conclusion about the benefit or harm associated with prescribing antibiotics for symptomatic dental infections.

**Are Antibiotics Beneficial for the Treatment of Symptomatic Dental Infections?**

**EBEM Commentators**
Aleksandr M. Tichter, MD, MS
Kenneth J. Perry, MD

**Emergency Medicine Residency**
New York-Presbyterian Hospital
Columbia University Medical Center
New York, NY

**Results**

Comparison of antibiotic versus placebo for primary outcomes.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>No. of Studies (No. of Participants)</th>
<th>Quality of Evidence</th>
<th>Time, Hours</th>
<th>Effect Size (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient reported pain</td>
<td>2 (61)</td>
<td>Very low</td>
<td>24</td>
<td>MD -0.03 (-0.53 to 0.47)</td>
</tr>
<tr>
<td>Swelling</td>
<td>2 (61)</td>
<td>Very low</td>
<td>72</td>
<td>MD 0.08 (-0.38 to 0.54)</td>
</tr>
<tr>
<td>Patient reported swelling</td>
<td>2 (61)</td>
<td>Very low</td>
<td>24</td>
<td>SMD 0.27 (-0.23 to 0.78)</td>
</tr>
<tr>
<td>Clinician reported infection</td>
<td>1 (20)</td>
<td>Very low</td>
<td>72</td>
<td>RR 0.27 (0.01 to 4.90)</td>
</tr>
</tbody>
</table>

CI, Confidence interval; MD, mean difference; SMD, standardized mean difference; RR, risk ratio.

Two randomized, placebo-controlled trials studying the effect of oral penicillin VK (in combination with oral analgesics and surgical pulpectomy) on the primary outcomes met inclusion criteria for this meta-analysis. Although antibiotic and analgesic dosing varied between studies, the antibiotic type and outcomes measures were similar and the individual study summary estimates were determined to be sufficiently homogenous to combine (range for $I^2$=0% to 61%).

No significant differences were observed between the antibiotic and placebo groups with respect to self-reported pain or swelling at 24, 48, or 72 hours, or clinician-reported infection at 72 hours. Adverse effects were reported by only 1 study, in which 1 patient in the antibiotic group reported fatigue and 1 patient in the placebo group reported diarrhea.

**Commentary**

Odontogenic infections result from the extension of decay or damage to the central pulp of a tooth, and, if left untreated, initially localized abscesses have the potential to develop into life-threatening deep-space neck infections. Although office-based dental procedures are the therapeutic mainstay, uninsured and Medicaid patients...
rely disproportionately on emergency departments (EDs) as a primary source of dental care.\textsuperscript{4,5} Available data suggest that nontraumatic dental complaints account for 1.4\% of ED visits and more than $200 million in hospital costs and are increasing at a rate of 4\% annually.\textsuperscript{3,6,7} Apart from dental referral, antibiotics are among the few adjunctive therapies available to emergency physicians for the interim management of symptomatic patients.\textsuperscript{8} Existing guidelines recommend their use only for patients with evidence of spreading infection but fail to cite corroborating data.\textsuperscript{9} ED treatment remains variable, with up to 50\% of patients receiving antibiotic therapy, which may result from the conflict between anecdotal evidence juxtaposed with a general mindfulness about antibiotic stewardship.\textsuperscript{10} This systematic review sought to determine the effect of systemic antibiotics on symptomatic apical periodontitis or acute apical abscess.

Although both of the studies included in this review recruited patients from university dental schools, the participants were healthy young adults similar to those presenting with tooth pain in many ED settings. Unlike the ED population, however, study patients were treated with both antibiotics and simultaneous surgical pulpectomy, a procedural intervention commonly delayed by hours to days after an index ED visit. The quality of evidence was limited by the failure of one study to report missing data and an imbalanced attrition rate exceeding 20\% in the other. Although investigators collected information about rescue analgesic use, the latter study failed to report these data, raising the possibility of selective outcome reporting bias.

Conclusions about therapeutic benefit or potential harm are further limited by the small number of participants. Overall, the results provide insufficient evidence to draw a conclusion about the benefit of prescribing antibiotics for symptomatic dental infections in the ED.


Michael Brown, MD, MSc, Alan Jones, MD, and David Newman, MD, serve as editors of the SRS series.