Review: penicillin V is better than placebo and equal to non-penicillins for acute maxillary sinusitis


QUESTION: In adults with acute maxillary sinusitis, which antibiotics lead to higher clinical cure rates?

Data sources
Studies were identified by searching Medline and EMBASE/Excerpta Medica (to October 1998) with the heading sinusitis and terms for randomised controlled trials, scanning bibliographies of relevant articles, and contacting pharmaceutical companies and experts in the field.

Study selection
Studies were selected if they were randomised controlled trials (RCTs) that compared an antibiotic with placebo or another class of antibiotic in 50 patients who were 18 years of age and had a history consistent with acute maxillary sinusitis confirmed by radiography or aspiration.

Data extraction
2 or more reviewers independently extracted data on study characteristics; interventions; study duration; length of follow up; cointerventions; compliance; and clinical, bacteriological, radiographic, and adverse event outcomes.

Main results
32 RCTs (7330 patients) with 34 comparisons met the inclusion criteria. Treatment duration ranged from 3–15 days. Penicillin V led to an increase in clinical cure rate (table). No difference in clinical cure rate was seen for amoxicillin compared with control in 2 heterogeneous RCTs. Newer non-penicillin antibiotics compared with penicillin V or amoxicillin (8 RCTs), or macrolide or cephalosporin compared with amoxicillin-clavulanate (8 RCTs) showed no difference in clinical cure rates. 5 RCTs comparing tetracyclines with a heterogeneous mix of antibiotics could not be meta-analysed. Dropouts from adverse effects were fewer for macrolide or cephalosporin than for amoxicillin-clavulanate (9 RCTs) (table).

Conclusion
In adults with acute maxillary sinusitis, penicillin V is better than placebo and equal to non-penicillins for achieving clinical cure.

COMMENTARY
Sinusitis accounts for 12% of the antibiotics prescribed for adults in primary care. Of additional concern is the trend toward the use of expensive, broad spectrum antibiotics, particularly in an era of emerging antimicrobial resistance.

The review by Williams et al provides credible evidence that a simple inexpensive antibiotic, penicillin, is effective in achieving a clinical cure for acute sinusitis. More importantly, this evaluation of 32 RCTs found no significant differences in cure rates with extended spectrum antibiotics. One broad spectrum agent, amoxicillin-clavulanate, had higher treatment attrition because of side effects. Interestingly, 1 study referenced by Williams found no benefit for the use of antibiotics in acute sinusitis.

One limitation of this review is the small number of studies that documented radiographic outcomes of sinusitis management plans. Sinusitis relapse rates are also a topic for additional inquiry because only 1 placebo controlled antibiotic trial reported this information. The authors recommend large controlled trials to determine clinical indicators for antibiotic use and clinical outcomes associated with particular antibiotics.

Consumer demand for antibiotics and provider prescribing practices have been implicated in the emergence of antimicrobial resistance. Williams et al's findings, the result of an exhaustive review of published and unpublished sources, should prompt clinicians to revisit the use of penicillin in acute sinusitis. Nurses in primary care have a unique opportunity to reduce the financial and public health costs associated with indiscriminate antibiotic use, firstly by educating patients away from the use of antibiotics in early upper respiratory infection, and, secondly, by reassuring patients that penicillin is an effective first line agent for sinusitis if an antibiotic is warranted.

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Antibiotics v placebo or other antibiotics for acute maxillary sinusitis*

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Comparison (no. of RCTs)</th>
<th>Weighted event rates</th>
<th>RRR (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical cure rate</td>
<td>Penicillin v control (2)</td>
<td>35% v 19%</td>
<td>72% (0 to 196)</td>
<td>7 (4 to 39)</td>
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<tr>
<td></td>
<td>Macrolide/cephalosporin v amoxicillin-clavulanate (9)</td>
<td>2% v 4%</td>
<td>56% (22 to 75)</td>
<td>44 (25 to 200)</td>
</tr>
</tbody>
</table>

*RCTs=randomised controlled trials. Other abbreviations defined in glossary; RRR, RBI, NNT, and CI calculated from data in article.