Systematic Review Snapshot

TAKE-HOME MESSAGE
In patients without underlying lung disease, antibiotics in acute bronchitis appear to decrease cough, but the clinical significance of this decrease is uncertain. Their use should be weighed against the cost and potential adverse effects for treatment of a self-limiting disease.

METHODS

DATA SOURCES
The Cochrane Central Register of Controlled Trials 2013, issue 12, which includes the Acute Respiratory Infections Group’s Specialized Register, MEDLINE (1966 to January 2014), EMBASE (1974 to January 2014), and Latin American and Caribbean Health Sciences Literature (1982 to January 2014).

STUDY SELECTION
Randomized controlled trials in which acute bronchitis patients without underlying pulmonary disease were assigned to a treatment (antibiotics), placebo, or no active treatment group.

DATA EXTRACTION AND SYNTHESIS
At least 2 authors independently assessed trial quality and risk of bias and performed data extraction. Risk ratio (RR) for categorical outcomes and mean difference for continuous data were measures of treatment effect in this meta-analysis. Heterogeneity was assessed and results were pooled according to a random-effects model under the broad definition of “clinically improved.”

Are Antibiotics Effective in the Treatment of Acute Bronchitis?

EBEM Commentators
Manpreet Singh, MD
Department of Emergency Medicine
Harbor-UCLA Medical Center
Torrance, CA
Alex Koyfman, MD
Department of Emergency Medicine
UT Southwestern Medical School/Parkland Memorial Hospital
Dallas, TX

Results

Table. Pooled outcomes for antibiotics versus control (placebo/no treatment) in acute bronchitis.

<table>
<thead>
<tr>
<th></th>
<th>RR</th>
<th>95% CI</th>
<th>NNT</th>
<th>Reduction in Ill Feeling Days</th>
<th>MD</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinically Improved</td>
<td>1.07</td>
<td>0.99 to 1.15</td>
<td>22</td>
<td>0.46 days</td>
<td>-0.46</td>
<td>-0.87 to -0.04</td>
</tr>
<tr>
<td>Cough</td>
<td>0.64</td>
<td>0.49 to 0.85</td>
<td>6</td>
<td>-0.04 days</td>
<td>-0.64</td>
<td>0.49 to 0.85</td>
</tr>
<tr>
<td>Night Cough</td>
<td>0.67</td>
<td>0.54 to 0.83</td>
<td>7</td>
<td>-0.04 days</td>
<td>-0.49</td>
<td>-0.94 to -0.04</td>
</tr>
<tr>
<td>Shorter Mean Cough Duration</td>
<td>1.20</td>
<td>1.05 to 1.36</td>
<td>5</td>
<td>-0.04 days</td>
<td>-0.94 to -0.04</td>
<td></td>
</tr>
<tr>
<td>Mean Cough Duration</td>
<td>0.87</td>
<td>0.83</td>
<td></td>
<td></td>
<td>1.36</td>
<td></td>
</tr>
</tbody>
</table>

NNT, Number needed to treat; MD, mean difference; NNH, number needed to harm.

Seventeen trials with 3,936 participants that were included in the primary meta-analysis showed no difference in clinical improvement when treatment with antibiotics was compared with placebo; interestingly, those treated with antibiotics were less likely to be considered improved based on a clinician’s global assessment score at follow-up (RR 0.61; 95% confidence interval [CI] 0.48 to 0.79). However, antibiotics were shown to have a modest benefit in terms of reducing days feeling ill, days with limited activity, cough, night cough, and mean cough duration. Although the risk was considered minor by the authors, patients treated with antibiotics were at increased risk of adverse effects (RR 1.2; 95% CI 1.05 to 1.36; number needed to harm 5), most commonly nausea, vomiting, and diarrhea.
Commentary

Acute bronchitis is a clinical diagnosis in which upper respiratory infection prodromal symptoms lead to the primary symptom of cough in this self-limiting condition, which lasts fewer than 3 weeks. Once pneumonia is ruled out in the right clinical context, treatment is often divided into antibiotic therapy and symptom management. Despite that 90% of acute bronchitis is a result of a viral cause and that current Agency for Healthcare Research and Quality guidelines discourage the routine use of antibiotics for bronchitis, two thirds (≈71%) of patients in the United States continue to be treated, and this proportion has increased. Patient expectations for an antibiotic prescription with bronchitis has been a key driver. As this systematic review has demonstrated, the potential benefits are marginal and of questionable clinical significance (eg, small improvement of mean cough duration of less than 1 day) in patients without underlying lung disease. Given the potential for serious adverse effects (eg, Clostridium difficile diarrhea, anaphylaxis), the risk of increasing respiratory pathogen resistance, and the cost of antibiotics (approximately $50 for a 5-day azithromycin course), the routine prescription of antibiotics for this self-limited condition should be questioned. This approach will require effort on the part of the emergency care providers to explain the potential risks versus the limited benefits of antibiotics.


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