Quantitative systematic review of randomised controlled trials comparing antibiotic with placebo for acute cough in adults

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Authors' objectives
To assess whether antibiotic treatment for acute cough is effective and to measure the side-effects of such treatment.

Searching
MEDLINE (from 1966 onwards) and EMBASE (from 1982 onwards) were searched with the Cochrane Collaboration search strategy and MeSH terms 'cough', 'bronchitis', 'sputum', 'respiratory tract infections'. The Science Citation Index and the Cochrane Controlled Trials Register were searched using the search terms 'bronchitis' and 'common cold'. Authors of trials were contacted for details of unpublished studies and UK antibiotic manufacturers were contacted requesting unpublished studies. The search was not restricted to the English language.

Study selection
Study designs of evaluations included in the review
Placebo-controlled trials (with allocation by formal randomisation or quasi-randomisation). Trials comparing different classes of antibiotics were excluded, as were trials where the unit of randomisation was the episode not the patient.

Specific interventions included in the review
Antibiotics.

Participants included in the review
Patients greater than 12 years old complaining of acute cough, with or without purulent sputum, who had not been treated in the preceding week with antibiotics and who attended family practice clinics, community-based out-patient clinic or out-patient departments attached to a hospital. Patients with chronic obstructive airways disease were excluded.

Outcomes assessed in the review
The proportion of patients with a productive cough at follow-up (7 to 11 days after consultation), the proportion of patients who had not improved clinically at follow-up, and the proportion of patients who reported side-effects from taking antibiotic or placebo.

How were decisions on the relevance of primary studies made?
Each trial was read independently by two authors.

Assessment of study quality
Each study was assessed according to the four criteria outlined in the Cochrane Collaboration Handbook: selection bias, performance bias, attrition bias and detection bias. The quality of each study was independently assessed by two authors using the four stated criteria to obtain a score. Measurement of agreement was calculated by means of the kappa statistic and disagreement was resolved by consensus.

Data extraction
The data were abstracted independently; when data were missing or incomplete the trial authors were contacted for clarification.

Methods of synthesis
How were the studies combined?
The relative risk (RR) and 95% confidence intervals (CIs) were estimated using both random-effects and fixed-effect models.

How were differences between studies investigated?
Comparisons between baseline risks and heterogeneity were explored using L’Abbe plots and chi-squared tests of heterogeneity.

Results of the review
A total of 8 studies were included.

Six studies (700 patients) were included in the analysis of productive cough at follow-up.

Five studies (515 patients) were included in the analysis of clinical improvement at follow-up.

Six studies (597 patients) were included in the analysis of side-effects.

Antibiotics were found to be no better than placebo when cough resolution at days 7 to 11 was assessed (RR 0.85, 95% CI: 0.75, 1.00).

Antibiotics did not significantly improve cough resolution at days 7 to 11 (RR 0.62, 95% CI: 0.36, 1.09).

The mean percentage of patients reporting side-effects in 7 trials was 19% (range: 12 to 30%). When one trial, which showed more side-effects from placebo than antibiotic, was excluded the heterogeneity was reduced and the side-effects were significantly associated with antibiotics (RR 1.9, 95% CI: 1.19, 3.02).

Authors’ conclusions
Treatment with antibiotic does not affect the resolution of cough or alter the course of illness. The benefits of antibiotic treatment are marginal for most patients with acute cough and may be outweighed by the side-effects of treatment.

CRD commentary
This review has a thorough search that attempts to identify unpublished literature. There are clear inclusion criteria and validity assessment, with appropriate synthesis of results. The authors discuss the limitations of the primary studies included.

However, the use of textwords in the search strategy may have identified further studies, and it is not clear whether the inclusion criteria were strictly adhered to. There is insufficient information about the assessed quality of the primary studies. Although details of the included studies are available over the web, it would have been useful to have more information in the text of the review.

Given the possible changes over time, it would have been useful to compare the results of more recent trials with older ones. It would also have been useful to know whether the results varied according to the specific antibiotics included in the primary studies.

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Record Status
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