Review: antibiotics have a slight beneficial effect on acute bronchitis

Bent S, Saint S, Vittinghoff E, et al. *Antibiotics in acute bronchitis: a meta-analysis*. *Am J Med* 1999 Jul;107:62-7.

QUESTION: In patients with acute bronchitis, do antibiotic drugs reduce sputum production, cough, or days off work?

Data sources

English language studies were identified in Medline (1966 to April 1998) using the terms drug therapy, bronchitis, and acute disease; the reference lists of relevant articles were reviewed, and experts in the field were contacted.

Study selection

Studies were selected if they were randomised controlled trials that compared antibiotics with placebo in patients who had acute bronchitis, but no history of chronic lung disease or pneumonia; treatment was given for ≥ 5 days; and effect sizes could be calculated from the data presented.

Data extraction

Data were extracted on sample size, patient age, study inclusion and exclusion criteria, antibiotic regimen, and outcome measures. The main outcome measure was days of sputum production, which was transformed into units of standard deviation for each study.

Main results

8 studies (660 patients) were included, which used either erythromycin, doxycycline, or trimethoprim/sulfamethoxazole. The overall summary effect size of antibiotic treatment was 0.21 units of standard deviation (95% CI 0.05 to 0.36), equivalent to about 1 half day less of cough and sputum production compared with placebo. Days of purulent sputum, days of cough, and days lost from work were measured in ≥ 4 trials and showed no difference between antibiotics and placebo (table).

Antibiotics v placebo for outcomes of acute bronchitis measured by ≥ 4 trials

Outcomes	Number of trials	Weighted mean decrease (95% CI)
Days of purulent sputum	6	0.4 d (-0.1 to 0.8)*
Days of cough	4	0.5 d (-0.1 to 1.1)*†
Days off work	6	0.3 d (-0.6 to 1.1)*†

* Not significant. † Heterogeneity existed among these studies.

Conclusion

In patients with acute bronchitis, the use of antibiotics reduces cough and sputum production by about half a day.

COMMENTARY

Acute bronchitis is generally self limited and primarily caused by viruses. The review by Bent *et al* offers a timely evaluation of an intervention that is frequently discouraged by authorities but still widely practised. The finding that antibiotics result in cough and sputum resolving approximately one half day sooner than without treatment is interesting, but the risks of treatment in an otherwise healthy individual probably outweigh these small benefits. Costs of unnecessary antibiotic treatment include medication costs, associated side effects, and increased risk of future infections with resistant bacteria. The number of individuals who improved sooner is comparable to the number who would develop adverse effects from drug therapy.

Meta-analysis of studies with similar designs and methodologies provides a more accurate measure of the overall effectiveness of the intervention.¹ The findings of this meta-analysis are consistent with 2 previous systematic reviews.²⁻³ The challenge facing clinicians is the ease of closing a brief patient consultation with an antibiotic prescription compared with the extra time to inform and educate patients.

The results of this review indicate to all advanced practice nurses with prescribing authority, as well as other nurses in primary care settings, that they should be prepared with evidence and educational materials to better inform patients about the appropriate use of antibiotics. Antibiotics do not provide a quick fix and the one half day of symptoms saved has a long term cost.

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- 1 Abramson J. *Making sense of data*. Second edition. New York: Oxford University Press, 1994.
- 2 Smucny J, Becker L, Glazier R, et al. Are antibiotics effective treatment for acute bronchitis? A meta-analysis. *J Fam Pract* 1998;47:453-60.
- 3 MacKay DN. Treatment of acute bronchitis in adults without underlying lung disease. *J Gen Intern Med* 1996;11:557-62.

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