Antibiotics for the prevention of acute and chronic suppurative otitis media in children

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ABSTRACT

Background
Acute otitis media (AOM) is a common childhood illness which may be frequent and painful. AOM may be associated with tympanic membrane perforation and can progress to chronic suppurative otitis media (CSOM).

Objectives
To determine the effectiveness of long-term antibiotics (six weeks or longer) in preventing any AOM, AOM with perforation and CSOM.

Search methods
We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, Issue 3) which includes the Acute Respiratory Infections Group’s Specialised Register, MEDLINE (January 1966 to July Week 4, 2010), OLD MEDLINE (1950 to 1965) and EMBASE (1990 to August 2010).

Selection criteria
Randomised controlled trials of long-term antibiotics versus placebo or no treatment for preventing AOM, AOM with perforation, or CSOM.

Data collection and analysis
Two authors independently extracted the data for: AOM; episodes of AOM; recurrent AOM; episodes of illness; side effects; antibiotic resistance; and outcomes at end of intervention (any AOM) and following cessation of intervention (any AOM). For dichotomous outcomes, we calculated the summary risk ratio (fixed and random-effects models). For rate outcomes, we calculated the summary incidence rate ratio.

Main results
Seventeen studies (1586 children) were included. All studies enrolled children at increased risk of AOM. In seven studies the children were prone to otitis media. The majority were high-quality studies and most (16 studies) reported data for our primary outcomes. One reported AOM with perforation or CSOM. Long-term antibiotics reduced any episode of AOM (14 studies, 1461 children, risk ratio
(RR) 0.65, 95% CI 0.53 to 0.79; random-effects model) and number of episodes of AOM (13 studies, 1327 children, incidence rate ratio (IRR) 0.51, 95% CI 0.39 to 0.66; random-effects model). Approximately five children would need to be treated long-term to prevent one child experiencing AOM whilst on treatment. Antibiotics prevented 1.5 episodes of AOM for every 12 months of treatment per child. We explored statistical heterogeneity. Long-term antibiotics were not associated with a significant increase in adverse events (12 studies, 817 children, RR 1.99, 95% CI 0.25 to 15.89; random-effects model).

**Authors’ conclusions**

For children at risk, antibiotics given once or twice daily will reduce the probability of AOM while the child is on treatment. In similar populations, antibiotics will reduce the number of episodes of AOM per year from around three to around 1.5. We believe that larger absolute benefits are likely in high-risk children. These conclusions were not affected by sensitivity analyses.

**Plain Language Summary**

**Antibiotics to prevent acute ear infections in children**

Acute otitis media (AOM, infection in the middle ear space) is common in children, causing pain and deafness. Most children experience at least one episode and some children suffer recurrent AOM (more than three episodes in six months or four episodes in 12 months), and some progress to eardrum perforation. Interventions (antibiotics, vaccines or reduced exposure to bacterial and viral pathogens) that decrease the frequency and/or the severity of infection are needed. Antibiotics given once or twice daily may reduce episodes of bacterial AOM and their complications. This review included 17 studies (1586 children). Long-term antibiotics (equal to or more than six weeks) almost halved the risk of further infections. There was not enough information to know if antibiotics reduced acute otitis media with perforation or chronic suppurative otitis media (chronic perforation), or improved long-term outcomes. Antibiotics did not appear to be a frequent cause of significant side effects (for example, allergic reactions or diarrhea). Parents must balance these potential side effects plus the cost and inconvenience associated with antibiotics against the likely benefits of treatment. Antibiotic resistance from the long-term use of these drugs is also an issue which should be considered, particularly for children with recurring infections.