Clinical failure is more common in young children with acute otitis media who receive a short course of antibiotics compared with standard duration

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Context
Acute otitis media (AOM) is a leading cause of doctor consultations and antibiotic prescriptions in young children.1 Strategies to reduce antibiotic prescribing for AOM and thereby the emerging spread of antimicrobial resistance have focused on watchful waiting and delayed prescription, in particular in children over 2 years.2 An alternative strategy to combat antimicrobial resistance is to reduce the duration of antibiotic treatment. So far, the evidence to support this strategy in young children with AOM has been incomplete.3

Methods
Hoberman and colleagues recruited 520 children from an academic children’s hospital and affiliated paediatric practices and a private paediatric research practice in the USA. Children were aged 6–23 months and diagnosed with AOM based on the following criteria: (1) recent onset of parent-reported AOM symptoms (score ≥3 on a 0–14-point scale), (2) presence of middle ear effusion and (3) bulging of the tympanic membrane. Children were randomised to a 10-day course of amoxicillin-clavulanate acid (90/6.4 mg/kg body weight) or a 5–day course followed by 5 days of placebo. The main outcome was the proportion of children who had clinical failure, defined as worsening or incomplete resolution of signs (primarily bulging of the tympanic membrane) and symptoms by the end of treatment at days 12–14. Secondary outcomes included symptom burden over days 6–14, the proportion of children whose symptom scores improved by at least 50% from baseline to end of treatment, AOM recurrence during the ongoing respiratory infection season, adverse events, nasopharyngeal colonisation with penicillin-non-susceptible pathogens, healthcare resource use and parental satisfaction with study treatment. Data were primarily analysed according to the intention-to-treat principle.

Findings
Clinical failure was more common in children who were treated with a 5-day course of amoxicillin-clavulanate than in those treated with a 10-day course: 77/229 (34%) vs 39/238 (16%), respectively (difference 17%, 95% CI 9% to 25%, number needed to treat=6). Mean symptoms scores on the 0–14-point AOM symptom scale were 1.61 vs 1.34 (p=0.007) over days 6–14 and 1.89 vs 1.20 (p=0.001) at the 12–14 days assessment for the 5–day and 10-day course groups, respectively. At days 12–14, children treated with amoxicillin-clavulanate for 5 days were less likely to have symptom scores improved by at least 50% from baseline than those treated for 10 days: 181/227 (80%) vs 211/233 (91%); p=0.003. There were no significant differences in other secondary outcomes.

Commentary
This well-designed and rigorously conducted non-inferiority trial provides important evidence on the effectiveness of a short versus a long course of antibiotics in young children with AOM. The study suggests that in young children with AOM a short (5 days) course is inferior to a standard (10 days) course; the between-group difference in clinical failure, a composite end point of otoscopic findings and symptoms, did clearly exceed the predefined non-inferiority margin.

The question remains, however, whether this difference means that all children aged 6–23 months with AOM should be treated with antibiotics for 10 days. The difference in the outcome that matters most to parents and caregivers, that is, the AOM symptom score including ear pain, fever, sleeping and feeding problems, was at most small, and the majority of children had substantial improvement of symptoms by the end of treatment.4 This is consistent with the findings of a previous individual patient data meta-analysis of six trials (1643 patients) of antibiotics for AOM carried out in more economically developed countries, showing that even in children of this particular young age group, most cases of AOM resolve spontaneously.5 The benefit of antibiotics on symptoms was modest and most straightforward in children with bilateral AOM and in those presenting with acute ear discharge.5

The rate of adverse events observed in the current trial is remarkably high, with one in three children reported as suffering from diarrhoea and dermatitis requiring a topical antifungal agent. This is important information for clinicians to share with parents and caregivers of young children when making decisions about antibiotic treatment.

Implications for practice
This high-quality trial improves the knowledge base for the management of childhood AOM. Based on its findings, recommendations regarding the duration of antibiotic treatment in young children with AOM are unlikely to change. The high rate of resolution of symptoms in both groups and lack of effect of treatment duration on AOM recurrence suggests that it is reasonable to advise parents to stop giving antibiotics after 5 days if AOM symptoms have resolved.

Competing interests None declared.

References and peer review Commissioned; internally peer reviewed.


4 http://blogs.bmj.com/bmj/2017/02/08/how-to-hide-trial-results-in-plain-sight/

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