

Effective diagnosis, treatment of ear infections in children examined in study

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Among the findings of an analysis of previous studies regarding ear infections in children are that results from otoscopic exams (an instrument for examining the interior of the ear) are critical to accurate diagnosis and antibiotics are modestly more effective than no treatment, with most antibiotics demonstrating similar rates of clinical success among children at normal risk, according to an article in the November 17 issue of *JAMA*.

Acute otitis media (AOM; [middle ear infection](#)) is the most common childhood infection for which antibiotics are prescribed in the United States. A study using 2006 data indicated an average expenditure of \$350 per child with AOM, totaling \$2.8 billion. "Timely and accurate diagnosis and appropriate management of AOM may have significant consequences for ambulatory health care utilization and expenditures," the authors write. "... however, wide variation exists in diagnosis and treatment."

To examine recent trial results and changes in clinician practice, Tumaini R. Coker, M.D., M.B.A., of the David Geffen School of Medicine at UCLA, Los Angeles, and RAND, Santa Monica, Calif., and colleagues conducted a systematic review of relevant studies to support the new AOM practice guidelines (currently in preparation) from the American Academy of Pediatrics. The researchers examined the evidence for the precision and accuracy of AOM diagnosis; the association of heptavalent pneumococcal conjugate vaccine (PCV7) use with changes in AOM microbial epidemiology; and the decision about

whether to treat with antibiotics, including the comparative effectiveness of different antibiotics and associated antibiotic-related adverse events. The authors identified 135 studies for inclusion in the review and analyzed those in which 3 or more articles examined the same comparison.

The researchers found that otoscopic findings of tympanic membrane bulging and redness were associated with accurate diagnosis. "Perhaps the most important way to improve diagnosis is to increase clinicians' ability to recognize and rely on key otoscopic findings," they write.

The authors also found that in the few available studies, prevalence of *Streptococcus pneumoniae* decreased (e.g., 33-48 percent vs. 23-31 percent of AOM isolates), while that of *Haemophilus influenzae* increased (41-43 percent vs. 56-57 percent) pre- vs. post-PCV7. Short-term clinical success was higher for immediate use of ampicillin or amoxicillin vs. placebo (73 percent vs. 60 percent), while increasing the rate of rash or diarrhea by 3 percent to 5 percent. Two of 4 studies showed greater clinical success for immediate vs. delayed antibiotics (95 percent vs. 80 percent and 86 percent vs. 70 percent).

"Of 100 average-risk children with AOM, approximately 80 would likely get better within about 3 days without antibiotics. If all were treated with immediate ampicillin/amoxicillin, an additional 12 would likely improve, but 3 to 10 children would develop rash and 5 to 10 would develop diarrhea. Clinicians need to weigh these risks (including possible long-term effects on antibiotic resistance) and benefits before prescribing immediate [antibiotics](#) for uncomplicated AOM," they write.

The researchers add that data are absent on long-term effects on antimicrobial resistance. Meta-analyses in general showed no significant differences in antibiotic comparative effectiveness.

"We found evidence to guide the diagnosis and management of AOM in children; however, further research is needed that (1) examines clinicians' diagnostic accuracy and precision using the 3 AOM diagnostic criteria [acute symptoms of infection, evidence of middle ear inflammation, and effusion]; (2) continues surveillance of AOM microbiology, especially in view of the newly approved PCV13; and (3) produces more high-quality studies on AOM management that include clear diagnostic criteria, a better-defined menu of clinical success measures that are universally applied, and more investigation into the comparative antibiotic-related adverse event rates that assesses whether any antibiotic regimen is superior to amoxicillin," the authors conclude.

More information: *JAMA*. 2010;304[19]:2161-2169.

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