Understanding otitis media in 2018
by H. Cody Meissner M.D., FAAP

Acute otitis media (AOM) affects about 25% of children in the first year of life and at least 60% of children by 5 years of age. The modest benefit of antimicrobial therapy for AOM in low-risk children has been emphasized due to concern for the emergence of bacterial resistance.

Which of the following statements are true?

a) Environmental factors associated with otopathogen colonization of the nasopharynx and subsequent otitis media include child care attendance, absence of breastfeeding, atopy, lack of administration of recommended pneumococcal conjugate vaccine (PCV) and lack of influenza vaccine administration.

b) Host factors that increase the risk of middle ear infection include anatomic abnormalities such as cleft palate, genetic conditions with craniofacial abnormalities such as Down syndrome, immune deficiencies, family history of otitis media and cochlear implants.

c) Treatment of AOM is the most common reason antibiotics are prescribed for children in an office setting.

d) The peak incidence of AOM occurs between 6 and 12 months of age.

Answer: All are true

The AAP clinical practice guideline on the diagnosis and management of otitis media in children 6 months through 12 years was updated in March 2013 (Lieberthal AS, et al. Pediatrics. 2013;131:e964, http://pediatrics.aappublications.org/content/131/3/e964) to provide greater precision in the diagnosis and treatment of AOM. A change in definition of middle ear infection was made to clearly differentiate AOM from cases of otitis media with effusion (OME).

A middle ear effusion may be present after resolution of an episode of AOM, or it may develop because of a viral upper respiratory tract infection that produces Eustachian tube dysfunction. In both of these settings, the middle ear effusion is not an infectious process and will not benefit from antibiotic therapy.

Available evidence suggests that following an episode of AOM, approximately 50% of children have an effusion behind the tympanic membrane (OME) at one month, 20% at two months and 10% at three months. Persistence of an effusion after treatment of otitis media is not considered to indicate antibiotic failure. Administration of additional antibiotic therapy in this setting facilitates the development of antimicrobial resistance and introduces the risk of adverse events related to the medication.
The need for antibiotic therapy for AOM should be decided on the presence of a bulging, opacified and inflamed tympanic membrane (tymanitis) with loss of mobility and evidence of an effusion. The three main bacterial causes of AOM (S. pneumoniae, H. influenzae and M. catarrhalis) have not changed in recent decades, but the relative proportion of each isolate has changed following the introduction of PCVs.

Results from a Rochester, N.Y., study of more than 600 children diagnosed with otitis media over a 10-year period and who underwent aspiration of the effusion were published in 2017 (Kaur R, et al. Pediatrics. 2017;140:e:20170181). Since PCV7 was introduced in 2000, the prevalence of pneumococcal vaccine serotypes has decreased in association with an increase in prevalence of H. influenzae as a cause of otitis media. Prevalence of M. catarrhalis also appears to have increased.

In the last 20 years, management guidelines from many countries have evolved to recommend a period of watchful waiting in children with mild to moderate AOM rather than initiation of antibiotic therapy at the time of diagnosis. This recommendation for delay or withholding of antibiotic therapy raised concern for an increased risk of complications, including tymanitic membrane perforation, 7th nerve palsy, subperiosteal abscess and infection of the mastoid bone, sinus vein thrombosis, labyrinthitis, bacteremia and meningitis. To date, studies on a possible association between a delay in antibiotic therapy and an increased risk of subsequent complications have yielded conflicting results, suggesting that if there is a risk, it is small.

The 2013 clinical practice guideline emphasized the importance of pain assessment, as pain may be a major symptom of AOM. Some children with OME will experience pain (in the absence of a bacterial component) and will not benefit from antibiotic therapy. Antibiotic therapy may not provide symptomatic relief from otalgia of AOM in the first few days of treatment, particularly in children younger than 2 years of age. Consideration of the use of analgesics (acetaminophen, ibuprofen) is recommended regardless of whether antibiotic therapy is prescribed. Data are insufficient to determine if analgesic otic drops are beneficial.

Michael E. Pichichero, M.D., from the University of Rochester, offered the following comments regarding treatment of AOM:

“What a challenging problem for pediatricians to decide about whether to prescribe antibiotics for AOM and which antibiotic to prescribe. The idea of uncertain diagnosis is interesting. If uncertain, then not prescribing a treatment that might harm seems quite reasonable (the Hippocratic Oath). If certainty is based on a bulging tympanic membrane and not just fluid behind the TM or opacity of the TM or redness of the TM, then a bona fide bacterial infection is highly likely. In that case, does one start with high-dose amoxicillin, as recommended in guidelines, since it is not too broad spectrum, has few side effects and is inexpensive? Alternatively, does one start with amoxicillin/clavulanate to maximize a treatment cure since a significant proportion of otopathogens in the PCV13 vaccine era are not sensitive to amoxicillin?

“The most recent data from our group suggests about half of AOM would be adequately treated using high-dose amoxicillin. That is why I favor amoxicillin/clavulanate when the diagnosis is certain.”

Dr. Meissner is professor of pediatrics at Floating Hospital for Children, Tufts Medical Center. He also is an ex officio member of the AAP Committee on Infectious Diseases and associate editor of the AAP Visual Red Book.