

**EDITORIAL**

# To Treat or Not to Treat Otitis Media – That's Just One of the Questions

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Acute otitis media (AOM) is a middle ear infection with rapid onset of symptoms and an abnormal-appearing, immobile tympanic membrane. Accounting for more than 20 million office visits a year in the United States, AOM is one of the most common reasons a child sees a family physician.<sup>1-3</sup> By their first birthday, nearly two thirds of children will have at least one episode of AOM, and more than 90% will have one episode by age 2 years.<sup>2,3</sup> A diagnosis of AOM is the most common reason children receive a prescription for antibiotics. Nearly \$5 billion is spent each year in the United States in managing AOM<sup>5,6</sup>; this expenditure does not take into account the disruption of child-care arrangements and work schedules.<sup>7</sup>

Despite the frequency and enormous associated costs of AOM, recent evidence from the medical literature has created controversy in nearly every aspect of its management. We, as family physicians, overdiagnose AOM in the United States.<sup>7,8</sup> A busy clinician examining a squirming, uncooperative toddler with an ear canal occluded with cerumen often will err on the side of making a diagnosis of AOM to please anxious parents. Diagnostic uncertainty by primary care physicians is as high as 33% to 42%.<sup>9,10</sup>

Because symptoms and signs (eg, fever, earache, tugging of the ear, irritability, etc) are nonspecific and not always present,<sup>3-11</sup> an accurate diagnosis of AOM requires a clear and well-illuminated view of the tympanic membrane. The light of the otoscope should work well; bulbs for most otoscopes should be changed every 2 years.<sup>8</sup> Pneumatic otoscopy and tympanometry are tools useful in confirming mid-

dle ear effusion. A bulging or cloudy tympanic membrane, with or without erythema, middle ear effusion, and marked decrease or absence of tympanic membrane mobility, is nearly 100% predictive of AOM.<sup>3</sup> Perforation of the tympanic membrane with purulent drainage is also diagnostic of AOM.

Recent evidence has thrown into question the use of antibiotics and the length of treatment, if prescribed. The growing worldwide development of multidrug-resistant bacteria, the uncertainty of diagnosis, and that up to one third of cases of AOM are viral in origin<sup>12</sup> have made popular a wait-and-see approach to the initial prescription of antibiotics, especially in many European countries. In several randomized clinical trials, antibiotics provided only a small benefit.<sup>13-15</sup> In a meta-analysis of more than 2000 children with AOM, ear pain resolved spontaneously without antibiotics in two thirds by 24 hours and in 80% by day 7.<sup>14</sup> This study estimated that 17 children would need to be given antibiotics to prevent 1 child from having some pain after 2 days, at the cost of a twofold increase in adverse reactions, such as skin rash, vomiting, or diarrhea. Minimizing the use of antibiotics in children with AOM does not increase the risks of perforation of the tympanic membrane, hearing loss, contralateral or recurrent AOM, or development of mastoiditis.<sup>3</sup> In summary, the immediate prescription of antibiotics offers some benefits, but these benefits are offset by the disadvantages of increased cost, drug resistance, and adverse reactions. Watchful waiting is feasible and acceptable to most parents, with a 76% reduction in the use of antibiotics.<sup>15</sup>

If antibiotics are used, amoxicillin remains the drug of choice for most children.<sup>16,17</sup> Although there are more than 1 dozen other clinically effective antibiotics approved by the Food and Drug Administration for treating AOM, none of these more expensive options has been shown to be more

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effective for empiric therapy of uncomplicated AOM.<sup>16</sup> Because of recent in-vitro evidence and some clinical experience of increasing penicillin-resistant *Streptococcus pneumoniae*,<sup>18</sup> a working group of the Centers for Disease Control advised doubling the amoxicillin dose to 80–90 mg/kg/d.<sup>19</sup> For those children who show no improvement with this increased dose in 3 to 5 days, alternatives such as amoxicillin-clavulanate (Augmentin), cefuroxime axetil (Ceftin), or the more expensive but better tolerated third-generation cephalosporins offer good alternative treatment options.<sup>20</sup>

There is strong evidence that 5 days of antibiotic therapy is as effective as the traditional 10- to 14-day regimen for uncomplicated AOM in children.<sup>21–23</sup> Although the 5-day regimen has a slightly higher risk of treatment failure at a 1-month follow-up compared with the longer course, there appears to be no difference in long-term (2 to 3 months) outcomes.<sup>22</sup>

Other controversies exist as to the role of surgery (tympanostomy tubes, adenoidectomy, or tonsillectomy) in the management of chronic effusion and frequent, recurrent episodes of AOM. Clearly, more evidenced-based studies are needed.

In this issue of the *JABFP*, we have yet another high-quality study from the International Primary Care Network (IPCN) and the Ambulatory Sentinel Practice Network (ASPN), which provides insight into the management of AOM.<sup>24</sup> From an evidence-based medicine perspective, this group shows the benefit of a large primary care practice-based research network in studying such common primary care problems as AOM. These 131 family physicians, general practitioners, and pediatricians enrolled 2,165 children with AOM, a feat difficult to achieve in the traditional university medical center settings.

As outlined in their article, our approach in North America to treating AOM is quite different from that of colleagues worldwide. In the Netherlands, from which arise many of the recent studies questioning the conventional management of AOM, physicians treat AOM in children symptomatically with analgesics and antipyretics and reserve antibiotics for those whose symptoms persist beyond 3 days. The British physicians treat AOM in almost all children with antibiotics for 5 to 7 days, whereas in North America our standard is to treat with antibiotics for 10 days.

To eliminate the problems of diagnostic uncertainty and overdiagnosis, physicians involved in this study were well trained in doing an ear examination, performing pneumatic otoscopy (except in the United Kingdom, where it is not routinely available), and in interpreting tympanometry. The extensive history obtained from parents showed that differences do exist in AOM risk factors among the countries. At the same time it also confirmed what we already know – cigarette smoking within the household, recent upper respiratory tract infections, and attendance at a large day care center are associated with the occurrence of AOM, whereas breast-feeding appears to be protective, particularly in those aged 6 to 24 months.

The authors developed a novel yet simple scale for assessing the severity of AOM. The use of this severity scale suggested that parents in North America seek medical care for their children much earlier than do those of their British and Dutch counterparts. In the Netherlands, it usually takes more than just tugging at the ears or fussiness for parents to bring their children to a primary care physician. The cost for this delay, however, appears to be more tympanic membrane perforations. It is unknown whether this delay results in future worse outcomes, such as hearing or speech deficits or developmental problems, but evidence thus far suggests that such outcomes do not occur.

It was encouraging to find that most primary care physicians continue to use a first-line agent, such as amoxicillin, in the initial treatment of AOM. Despite evidence in the literature, however, physicians in North America tend to choose the more costly second-line antibiotics, such as cephalosporins, for older children and for those with perceived more severe disease.

This study rightly points out that we need to be cautious when adopting treatment policies from various countries that have different approaches to health care and different risk factors. It also highlights the potential benefits of adopting the wait-and-see approach, with its decrease in the use of antimicrobials and a possible annual savings in the United States of \$185 million. A lot of prenatal care to the underserved can be provided with those savings.

Finally, this study is just one step in evidence-based medicine. Applying this information in clinical practice is equally important. Changing physician behaviors is quite difficult, as highlighted in

my own residency program. In the face of mounting evidence 2 years ago that we overdiagnose AOM and should at least consider shortening the course of antibiotics, if used, my residents and colleagues continue to prescribe 10 days of antibiotics. When asked why, the reply is, "Well, that's what they do in pediatrics." Obviously, we have a long way to go before we fully adopt an evidence-based approach to AOM.

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