Therapy Update

MEASURES to manage and prevent otitis media — such as antibiotics and vaccines — may, in themselves, be driving the need to change the approach to managing this condition. In this article, we examine the evolving role of antibiotics, the impact of vaccines, the changing complications of acute otitis media and we review the indications for grommets.

What role for antibiotics?
The use of antibiotics in acute otitis media in children over two years of age is controversial due to the high rate of spontaneous symptom resolution.

Only modest benefits have been demonstrated for antibiotic treatment of acute episodes in children aged over two, with estimates of a 3% improvement in symptom resolution at day 2-3.

Data published last year in the New England Journal of Medicine suggests a slightly greater benefit in those aged 6-23 months, but the study methodology has been criticized by many.2

Children treated with antibiotics also have higher rates of carriage of resistant pneumococci in their nasopharynx — a change evident across whole populations, with significantly fewer cases of resistant pneumococcus in populations where routine antibiotic treatment of acute otitis media is discouraged.

Guidelines produced by the American Academy of Pediatrics (AAP) and the American Academy of Family Physicians (AAFP) in 2004 recommend a period of watchful waiting in selected children with otitis media (table 1). Antibiotic treatment is generally reserved for the very young (younger than two years of age) and especially when these children display more severe symptoms and signs of infection.

However, follow-up studies in the US and Scandinavia have demonstrated very poor adherence to these guidelines, usually attributed to perceived parental pressure.

In children with recurrent acute otitis media (rAOM), the evidence for prophylactic low-dose antibiotics is poor. Initial estimates of the efficacy of antibiotic prophylaxis suggested a 1.5-episode, per person, per year reduction in episodes of rAOM, while some later work has suggested no significant difference at all.

Further, this minimal effect is in the context of the potential for side effects of medications and the development of resistant organisms. In fact, more recent studies have suggested that the development of antimicrobial resistance in the three most common bacterial species that contribute to rAOM — pneumococcus, haemophilus and moraxella species — may account for the reduced efficacy of prophylactic antibiotics.3

What impact have vaccines had?
The introduction of pneumococcal conjugate vaccines has changed the flora involved in otitis media. The heptavalent pneumococcal conjugate vaccine (7-PCV — Prevenar, Wyeth) was developed. The serotypes included in the vaccine accounted for up to 70% of cases of acute otitis media in the US at the time of development.

Infant vaccination programs became common in the US in the early 2000s, with the vaccine added to the Australian childhood immunisation schedule in 2005. The overall burden of acute otitis media was thought to decrease by 6.7% after introduction of 7-PCV vaccination programs in study communities in California and Finland — a much smaller effect than the observed reduction in invasive pneumococcal disease.

Vaccine serotypes were often eliminated from vaccinated children, but other serotypes and other organisms largely filled the void left by the absence of 7-PCV serotypes. For several years, non-typeable Haemophilus influenzae (NTHi — distinct from Haemophilus influenzae type B — Hib) became the most commonly identified causative organism in acute otitis media, with Moraxella catarrhalis the second most common.

More recently, however, pneumococcus has caught up to NTHi in causation of acute otitis media due to increased rates of infection due to non-vaccine serotypes such as 6A, 6C and 19A.

Experts DR PHIL SALE and DR NIRMAL PATEL advise on recent changes and controversies in managing otitis media.

The introduction of pneumococcal conjugate vaccines has changed the flora involved in otitis media.
OME — Unilateral middle ear effusion persisting for six months, or bilateral effusion persisting for three or more episodes in six months or four or more episodes in 12 months. Three or more episodes in six months or four or more episodes in 12 months.

Placement of a ventilating tube in AOM with suppurative complications allows longer-term drainage as well as facilitating delivery of ototopical medications.

Adapted from reference 13.

Have complications changed?

Some authors have reported an increase in cases of acute mastoiditis complicating acute otitis media in the years following adoption of watchful waiting protocols advised by the WHO/AAP in 2004. However, more recently, multicentre reviews by Swedish hospitals — where similar watchful waiting practices have been in place since 2000 — demonstrated no increase in the incidence of mastoiditis or other suppurrative complications of acute otitis media since the introduction of those practices. Nevertheless, primary care providers need to be aware of the spectrum of potential complications of severe and partially treated acute otitis media, particularly given that their symptomatology may be altered in the setting of contemporary medical care and widespread antibiotic use.

Masked mastoiditis is now the precursor to a large percentage of suppurrative complications of otitis media. In such cases, the original otitic symptoms may have been the only clue to an otogenic origin of infection.

Antibiotic treatment can eliminate most classical otitic symptoms (such as ototrauma, otalgia, fever), meaning that a problem is not identified until the onset of neurologic symptoms and signs including facial nerve paralysis, mental state change, seizure activity, nausea and vomiting. When are granomets indicated?

Although formal recommen- dations for the use of middle ear ventilating tubes (grommets) remain unaltered since 2004 (table 3), recent work on the long-term outcomes of patients with ventilation tubes inserted for chronic otitis media with effusion (OME) has the potential to alter clinical practice.

In 2007, research published in the NEJM suggested that in otherwise healthy children younger than three, the period of watchful waiting prior to insertion of ventilating tubes for OME can be extended from the typical three months to nine months without any measurable detrimental effect on cognitive, psychosocial, auditory processing or speech measures. However, as the period of watchful waiting is extended, recognising children at higher risk of developing speech and language disorders is impor- tant to avoid delay in ventilating tube insertion.

The research group’s interpre- tation of their data caused some concern, with others pointing out that the rigorous selection criteria in the study meant that only children who were already at a very low riskobject of development seque- lae (otherwise healthy chil- dren, most of them with only unilateral effusions and thus
normal hearing in their unaffected ear) were included. These low-risk children are generally in the minority of children considered for surgical management of their ear disease.

Also, OME does not generally exist on its own, and most children being considered for insertion of ventilating tubes for OME already qualify for ventilating tubes on other criteria, generally recurrent acute otitis media. Overall, when indicated, the evidence for using ventilating tubes for either recurrent acute otitis media or OME in children, all indicate significant improvements in disease-specific quality of life.13

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References
1. Cochrane Database of Systematic Reviews 2000; CD000219.