

## Childhood otalgia: acute otitis media

### 1 Antibiotics not necessary in most cases George G Browning

#### Anecdote

When doctors are faced with a crying, fretful child who seems to have a sore ear their initial reaction is almost certainly to diagnose acute otitis media. This is often reinforced by the thought that otitis media is a difficult diagnosis to exclude. The next stage is to decide that even if the diagnosis is uncertain it must be treated as such and that antibiotic treatment ought to be given as otitis media is a bacterial infection. Though recovery can occur without an antibiotic, anecdote also suggests that when one is given the response is usually dramatic and the child is better within 24 hours. Thus withholding antibiotic treatment could be considered incorrect and, besides, are not the risks of antibiotic treatment negligible? In addition, is it not because of the ready availability of antibiotics that the incidence of sequelae such as mastoiditis and chronic otitis media has been reduced? Hence it is often argued that every child with otalgia should be prescribed antibiotics and that parents might consider a doctor negligent if he or she did not do so.

#### The facts

Where, if any, are the flaws in this chain of arguments?

#### Aetiology of otalgia

The chances that a child with otalgia will have acute otitis media are less than half.<sup>1</sup> There are many alternative diagnoses that can either be otological or be referred from an area supplied by the same nerves as the ear—namely, the fifth and ninth cranial nerves (figure). In children with an upper respiratory tract infection eustachian tube dysfunction and oedema commonly give rise to negative pressure in the middle ear or the production of non-infected exudate, or both. The other main otological cause is myringitis, which is thought to be due to a viral infection and gives rise to a red ear without a middle ear exudate. Children with an upper respiratory tract infection commonly also have pain referred to the ear from a sore throat. In addition, teething is a well known cause of fretfulness in infants and is often associated with otalgia.

#### Diagnosis

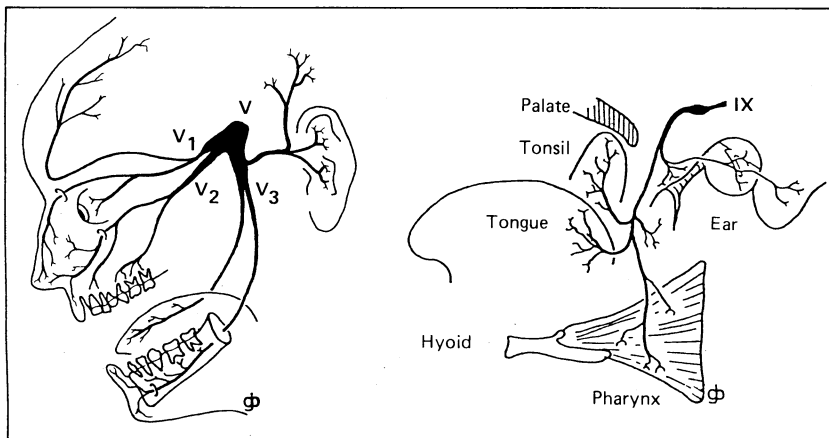
Unfortunately the otoscopic diagnosis of acute otitis media is not easy even when carried out by specialists. In countries where otolaryngologists perform a myringotomy as the initial treatment 20-30% of ears do not yield pus.<sup>2</sup>

#### Cause of acute otitis media

The bacteria isolated from ears with surgically confirmed acute otitis media have been well documented but what is often omitted is that in 20-30% of ears no bacteria will be isolated.<sup>3</sup> This could be due to technical reasons, but an alternative hypothesis is that the cause of the inflammatory exudate is viral.

#### Natural course

As can be imagined, when half of all children in their first year of life have otalgia<sup>4</sup> the pharmaceutical industry has much to gain from the routine prescription of antibiotics with the presumption that the cause is acute otitis media. Many trials have been carried out and, unfortunately, there is currently no consensus of scientific opinion. Most studies have compared one antibiotic with another or one antibiotic dose regimen with another rather than with a non-treated control group. Another problem is that often the distinction between acute otitis media and otitis media with



Sensory distribution of (trigeminal) and (glossopharyngeal) cranial nerves. Reproduced from Browning GG. "Updated ENT." 2nd ed. Sevenoaks: Butterworths, 1987:156-7, by permission

### EDITORIAL COMMENT

Here is a problem familiar to any general practitioner or medical parent. I have no difficulty being intellectually convinced that most otalgia in childhood does not result from acute bacterial otitis media. Equally, both authors highlight the difficulty of identifying which children do have a bacterial infection and which children will still be in pain as a result of that bacterial infection 24 hours or so after presentation. The diagnostic facilities available to the general practitioner will simply not allow the

answer to be given soon enough to make a rational judgment based on microbiological information. Under these circumstances it is understandable, and in my opinion reasonable, to treat the least tolerable option, which is that the child has acute bacterial otitis media. Both authors make the valuable point that relevant studies have not been performed. Nevertheless, until a community based project shows that the routine use of antibiotics in acute otalgia in childhood confers no benefit my personal bias would be to prescribe an antibiotic. — PETER CRUBIN, professor of therapeutics, University of Nottingham

Scottish Section, Medical Research Council Institute of Hearing Research, Royal Infirmary, Glasgow G31 2ER  
George G Browning, FRCS, reader and consultant otologist

Br Med J 1990;300:1005-7

effusion (serous otitis media, or glue ear) is not clearly made. That commercial pressure is considerable is evidenced by the fact that in a recent large American study the *New England Journal of Medicine* received two articles based on the same subjects but submitted by two different groups of investigators.<sup>5</sup> Both groups had participated in designing and carrying out the study but they could not agree on the results. One group thought that the data statistically supported the use of antibiotics whereas the other group did not. The article supporting antibiotic treatment was the one that was published.

Most likely the answer is that in most children antibiotics make no difference to the outcome in either the short or the long term. More than 85% of the children will be pain free within 24 hours irrespective of whether they have been treated with an antibiotic or not.<sup>2</sup> Such treatment is not without side effects—for example, some children develop diarrhoea. The evidence that antibiotics reduce the incidence of mastoiditis is negligible, and indeed this would be hard to prove as the current risk of this occurring when no antibiotics are prescribed is around 0.04%.<sup>2,6</sup> Equally, though the impression is that chronic otitis media is less common than it used to be, there is no evidence to support this once socioeconomic factors have been controlled for (S Gatehouse, proceedings of the eighth international congress in audiology, Jerusalem, 1988).

Thankfully, though often claimed, there is also no evidence that antibiotic treatment increases the risk of subsequent otitis media with effusion even if the course is incomplete. This occurs in 10% of children after acute otitis media irrespective of treatment.<sup>2</sup>

Finally, in Scandinavian countries antibiotics are not commonly given for childhood otalgia and therefore parents seem not to expect their child to be prescribed them. It is thus a matter of education. If doctors could only more confidently state that antibiotics are unneces-

sary in most instances then parents would normally accept this without question.

### Alternative management strategy

So far I have been fairly critical of what often happens based on anecdote. What alternative is suggested based on science? Whether the cause of acute otalgia in childhood is diagnosed correctly is perhaps irrelevant. By definition, all children will be in pain so an analgesic such as a paracetamol elixir will be necessary, irrespective of the cause. In addition, a mild antihistamine sedative, perhaps with a systemic decongestant, will at least allow everyone including the parents to get to sleep, even though it might have no effect on the condition.<sup>7,8</sup> In 85% of children with acute otitis media the otalgia will have subsided within 24 hours irrespective of whether they have received an antibiotic or not.<sup>2</sup> Antibiotic treatment should be considered only in those who still have otalgia after 24 hours. If this policy were to be generally followed in the United Kingdom 1.84 million fewer prescriptions for antibiotics would be given for childhood otalgia<sup>9</sup> at a saving of around £6m a year (Viewdate Drug Information Systems, Edinburgh Royal Infirmary, unpublished data).

- 1 Ingvarsson L. Acute otalgia in children—findings and diagnosis. *Acta Paediatr Scand* 1982;71:705-10.
- 2 Van Buchem FL, Dunk JHM, Van't Hof MA. Therapy of acute otitis media: myringotomy, antibiotics, or neither? *Lancet* 1981;iii:883-6.
- 3 Dadswell JV. Bacteriological findings in acute otitis media. *Lancet* 1967;ii:243-4.
- 4 Ingvarsson L, Lundgren K, Olsson B, et al. Epidemiology of acute otitis media in children. *Acta Otolaryngol (Stockh)* 1983;suppl 388:1-52.
- 5 Anonymous. Policing the page [Editorial]. *Economist* 1989 June 3:119.
- 6 Van Buchem FL, Peeters MF, Van't Hof MA. Acute otitis media: a new treatment strategy. *Br Med J* 1985;290:1033-7.
- 7 Meistrup-Larsen K-I, Mygind N, Thomsen J, et al. Oral norephedrine in the treatment of acute otitis media. *Acta Otolaryngol (Stockh)* 1978;86:248-50.
- 8 Bain DJG. Can the clinical course of acute otitis media be modified by systemic decongestant or antihistamine treatment? *Br Med J* 1983;287:654-8.
- 9 Office of Population Consensus and Surveys. Acute otitis media. *OPCS Monitor* 1987.

## 2 Justification for antibiotic use in general practice

John Bain

### Presentation

In childhood acute earache is most commonly due to infection of the middle ear, otherwise known as acute otitis media. One in four children will have an episode of acute otitis media at some time during the first 10 years of life, the peak incidence occurring between the ages of 3 and 6 years.<sup>1,5</sup>

The onset of earache is often rapid and distressing, with advice from the general practitioner often being sought urgently. In infants and toddlers the combination of pain with associated upper respiratory symptoms causes stress for parents who are naturally unsure of how best to comfort a screaming and fractious child. General practitioners are often faced with children during the early stages of the disease when precise diagnostic accuracy is, and has to be, less exacting than that outlined by textbooks.

Examining the tympanic membrane in children is difficult, with limited opportunities to achieve a full view of the eardrum. A fleeting glimpse of the drum may show a leash of prominent blood vessels along the handle of the malleus (see figs), and any hint of inflammation is sufficient to encourage many doctors to diagnose an underlying bacterial infection. Are "painful red eardrums" always due to underlying bacterial infection? There is little consensus about which appearances are diagnostic, but a bulging eardrum has frequently been cited as one of the most

useful indicators.<sup>6,7</sup> Any sign of inflammation of the eardrum is likely, however, to lead most general practitioners to make a presumptive diagnosis of acute otitis media.

### To treat or not to treat?

With no hard and fast rules about which combination of symptoms and signs are associated with the presence of organisms such as *Streptococcus pneumoniae* and *Haemophilus influenzae*, treatment poses several dilemmas. For general practitioners the fleeting hour is a constant enemy and explaining to parents the use of analgesics along with a "wait and see" policy<sup>8</sup> is often more difficult than reaching for the prescription pad and issuing a combination of antibiotic and decongestant.

The standard approach to a rapid onset of earache is a seven to 10 day course of a broad spectrum antibiotic, but only half of all children will complete a one week course. Recent studies have shown that short courses (two to three days of antibiotic) at conventional or high doses are equally effective in terms of resolution of symptoms and signs.<sup>9,10</sup>

Studies from Scandinavia and The Netherlands have shown that antibiotics are not essential in the treatment of all infections of the middle ear.<sup>11,12</sup> The problem for general practitioners is teasing out which children are