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PAEDIATRICS

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Otitis Media

Introduction

The agony of otitis media, and the child who is hard of hearing because of middle ear fluid, are familiar to all those who work with young children. Ear infections are among the most ubiquitous of illnesses suffered by infants and young preschoolers, while the insertion of tympanostomy tubes has become the most common surgical procedure in this age group.

Definitions

Acute otitis media (AOM)

AOM implies acute infection and inflammation of the middle ear, with an ensuing middle ear effusion. It is characterised by the rapid onset of fever, irritability, and otalgia (ear pain) which may cause young children to pull at their ears. If the drum bursts, purulent fluid drains from the ear canal, causing concern to parents but immediate relief to the sufferer!

Otitis media with effusion (OME)

Like AOM, otitis media with effusion is characterised by fluid in the middle ear cavity behind the tympanic membrane, but the fluid is only occasionally infected, and signs of inflammation are usually absent. The fluid prevents the normal conduction of sound through the middle ear to the inner ear, hence the term "conductive hearing loss" often used in this condition. This temporary mild deafness has been the main reason for concern about OME.

Epidemiology

Both AOM and OME are illnesses that mainly affect the young child, with peak incidences between six months and two years of age. After six years of age, the incidence rapidly declines.

Over 80% of children experience at least one episode of AOM by three years of age, with many suffering

recurrent bouts. While up to 30% of infections may be viral in origin, the majority are caused by bacteria, in particular the familiar *Streptococcus pneumoniae* and *Haemophilus influenzae*. The middle ear fluid may take some time to clear after the infection itself has resolved. 70% of children will still have a middle ear effusion 2 weeks after an episode of AOM, 40% at 4 weeks, and 20% at 8 weeks, but by three months only 10% of children still have the effusion (see Diagram). Thus the majority of effusions will clear by themselves with a period of "watchful waiting".

Persistence of middle ear effusion versus time following the initiating otitis media.

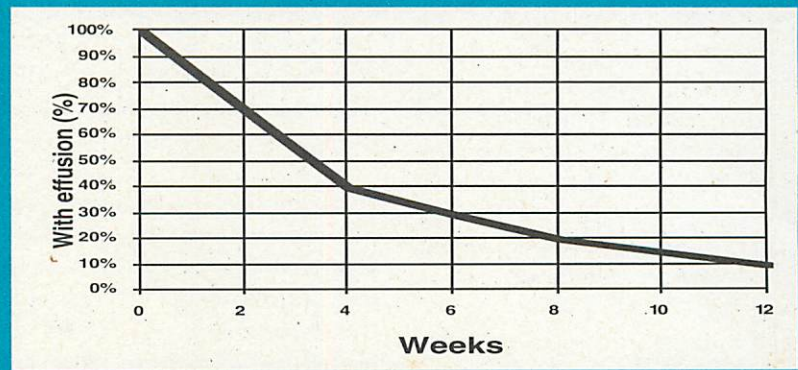


Illustration adapted from Teele DW, Klohn JO, Rosner BA. *Epidemiology of otitis media in children, Ann Otol, Rhino Laryngol* 1980,89(68):5-6

It is estimated that at any one time 10-20% of young children will have OME, with higher incidences during the winter months. When compared with the 0.1% incidence of sensorineural deafness, it is evident that OME is by far and away the **commonest** cause of paediatric hearing loss; however, unlike sensorineural hearing loss, the conductive loss of OME is usually mild (10-40dB) and often resolves spontaneously.

DIAGNOSIS

Acute otitis media (AOM)

The child with AOM often presents with symptoms of fever, otalgia, malaise and diminished hearing in the affected ear. Visualisation of the tympanic membrane may then reveal a reddened, opaque and even bulging drum. The diagnosis of AOM is not difficult to make in this situation by a trained clinician. However, particularly in younger children or in those prone to recurrent otitis, the symptoms and signs may be less clear. Inspection of the tympanic membrane, and accurate interpretation of the results, is often difficult, especially in young children.

In younger infants, more general systemic features such as vomiting, abdominal pain and diarrhoea, may accompany an episode of AOM, there being few if any symptoms isolated to the ear. Fever may or may not be present. On examination of the tympanic membrane the distinction must be made between the "blushing" brought on by crying and true erythema. The latter would be supported by retraction, opacity or bulging of the tympanic membrane. Otorrhoea in this age group usually signals perforation of the tympanic membrane.

Children prone to recurrent AOM such as those in day care, those with OME, cleft palate or Down Syndrome, often have persisting opacity and erythema of the

tympanic membranes. It is useful for these children to be examined by the same doctor who becomes familiar with the appearances in the specific child. However, the combination of fever, otalgia and a poorly mobile tympanic membrane on pneumo-otoscopy would usually signify an acutely infected middle ear.

Otitis Media With Effusion (OME)

The most reliable sign of OME is reduced mobility of the tympanic membrane on pneumo-otoscopy. Rather than the brisk in and outward movement in response to gentle insufflation, the tympanic membrane may wrinkle and appear "waxy" on the surface, or not move at all. The tympanic membrane will usually be more opaque due to its thickening or the visualisation of fluid behind. The fluid may be bluish, yellow or greyish in colour. Unless a fluid level or bubbles can be seen, otoscopy without the pneumatic attachment is often unreliable in the diagnosis of OME. Audiology will show a conductive hearing loss and tympanometry various degrees of flattening of the wave form (Type B).

MANAGEMENT

Acute Otitis Media

Whilst antibiotics are important in the management of AOM, measures to alleviate pain and fever are welcomed by the sufferer. Nasal sprays, pseudoephedrine preparations and anti-histamines are of no proven benefit and may aggravate by thickening secretions. Nose blowing will be painful initially but may be useful in the resolution stage.

For a child not predisposed to AOM for reasons mentioned above, Amoxicillin is an appropriate first line antibiotic. It is safe, inexpensive and covers the majority of likely bacterial pathogens. In children with recent failure of Amoxicillin or recurrent AOM an antibiotic which treats

beta-lactamase producing bacteria e.g. Amoxicillin-Clavulanate (Augmentin) may be preferable. Antibiotics are usually prescribed for 10-14 days and compliance with dosage instructions is important. If after 48 hours of treatment symptoms are not subsiding, the child should be re-examined by their doctor for associated complications and review of medication.

Otorrhoea signifies tympanic membrane perforation and the ears should be kept dry. The child's doctor may perform ear toilets to remove discharge and allow topical antibiotic preparations to reach the middle ear more effectively. Chronic otorrhoea is often associated with the growth of multiple bacteria including gram negative and anaerobic species. Ear swab and culture may be required to establish appropriate antibiotic sensitivities.

Otitis Media With Effusion

Middle ear effusion present for 3 months due either to failure of resolution after AOM or recurrent re-infection is reason for referral for specialist ear nose and throat examination. There is no effective medical treatment, although prophylactic antibiotics may be useful for the child with recurrent exposure to infection. Surgical intervention with insertion of middle ear ventilation tubes (grommets) may be required. Although a common surgical procedure, its benefits are still debated in the literature particularly for the many children whose hearing loss is very mild or unilateral. Of importance is the management of the child's hearing during the period of OME to ensure that language acquisition and learning proceed smoothly. For the child with chronic severe OME this may mean consideration of discretionary hearing aid usage in at least one ear.

IMPLICATIONS & COMPLICATIONS

Suppurative complications of AOM, such as mastoiditis and meningitis, are now rare. The reason for this decline is not clear, but is thought to be only partly due to the increased use of antibiotics over the last decades. Occasionally, a child is still seen with unilateral facial palsy, which usually resolves spontaneously.

A perforation of the tympanic membrane may persist after a ruptured ear drum (either due to AOM or tympanostomy tubes) but usually heals by itself, unless it is very large. Otorrhoea, if present, should be treated as described above. Rarely, tympanoplasty (a graft of the eardrum) may be required.

However, the effects of hearing loss have caused the greatest concerns about otitis media in recent years. A later article will be devoted to otitis media with effusion and its implications.

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FLU INJECTIONS

The vast majority of children do not need to have the influenza vaccination.

There are a number of children in **high risk groups** who should be vaccinated.

These include:

1. Children with chronic chest conditions, such as **cystic fibrosis** or **severe asthma**, or other conditions requiring oral or high dose daily inhaled steroids.
2. Children who may have **decreased immunity** due to medical conditions or various drug treatments.

3. Children who are unwell or debilitated because of **underlying medical conditions**.

Children who belong to these groups make up only a small proportion of the childhood population.

However it is most important that the regular immunisations for whooping cough, tetanus, diphtheria, rubella, measles, polio, etc. be maintained so that all children are fully immunised against these potentially very serious conditions.

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from
the
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READING ABILITY OF PARENTS COMPARED WITH READING LEVEL OF PEDIATRIC PATIENT EDUCATION MATERIALS

TC Davis et al. *Pediatrics* 93 (3) Mar 1994 pp 460-468.

A study of 396 parents and other caregivers accompanying children to the public outpatient clinics at the Louisiana State University Medical Center was designed to test their reading ability in order to compare that with the level required to read patient education material and consent forms. The 126 written materials analysed included 23 brochures from The Injury Prevention Program widely distributed by the American Academy of Pediatrics. Despite most parents having reached at least ninth grade in schooling, the mean and median reading equivalents were sixth grade, and some were as low as fourth grade.

Analysis of the reading materials revealed that the vast majority required reading levels of 9th to 19th grade. No materials were written at less than 5th grade level. Generally the materials were written at well above the reading ability of the average public clinic parent. "Children's health care will be compromised if physicians incorrectly assume that all parents can read and

understand health-related materials. In this study, almost two-thirds of parents tested could not read at more than a ninth grade level, whereas 81% of the written materials they were expected to read required at least a high school reading ability." As well as readability, other considerations such as format, learnability, accuracy, motivational messages and legibility need to be taken into account.

The authors recommend using simple words, short sentences, large print, few directives, space between paragraphs, culturally sensitive graphics, and pictures of people modelling the appropriate behaviour. Video and audio tapes can also be used. Finally, "Pediatricians and public health nurses can encourage parents to read to their children by offering free books, and physicians can refer parents to adult literacy classes when appropriate. These interventions may enhance the literacy, health, and quality of life of both child and parent."

ON THE SHELF - NEW BOOKS



OOPS. A common sense approach to toilet training a child who has a "problem". By Linda Hoath in collaboration with Suzanne Gilbert. 1993, pp 134. Price \$ 17.50 (plus \$4.00 postage for mail orders).

This very practical and much needed book discusses the management of childhood incontinence (excluding bedwetting). Particular emphasis is placed on bowel and bladder care for the child with spina bifida. Other special needs children are included such as

those born with hirschprung's disease, imperforate anus as well as autism and chronic constipation.

The first few pages, "Help! Please hear my feelings", immediately reassure parents that the approach used by the author is full of empathy. The book provides ideas to build on and make a programme to suit the individual child and family.

The section on catheterization is excellent, the terminology always clear

with easy to follow explanations. The sections on diet, coping with school and clothing are informative and practical.

Written initially for nurses and doctors, this book is also highly recommended for use by teachers, integration aides, parents and others involved in the care of the special needs child.

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