

Childhood otitis media with effusion

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A 4-year-old boy attends the children's ENT clinic with his mother, having failed a community paediatric audiology assessment. He appears inattentive at nursery and at home.

What you should cover in the history

Otitis media with effusion (OME or 'glue ear') is the most common cause of hearing impairment in childhood. The condition is generally self-limiting, but may occur during a period when poor hearing may temporarily impede speech and language development and social behaviour. About 80% of children aged 10 will have been affected by an episode of otitis media with effusion during childhood mostly in the first 3 years.¹ With no treatment, the natural history of OME is generally of spontaneous resolution. Watchful waiting with monitoring of hearing over a 6-month period will result in spontaneous resolution of the OME in over 90% of children.²

- *Has he had frequent ear infections?* OME may occur and persist in the absence of infection. However, >50% of episodes of OME follow episodes of acute otitis media (AOM). AOM as a precursor of OME is more common in younger children, under the age of 3 years. Children with OME typically experience up to five times more episodes of AOM than those without OME.³ OME and episodes of AOM are more common in those attending daycare.⁴
- *What difficulties does he have with hearing and for how long have these been apparent?* Moderate hearing loss secondary to OME may present more difficulty in a group situation, such as nursery. Parents frequently report lack of awareness of their child's mild to moderate hearing loss.
- *Is the child's speech and language development age appropriate?*
- *Were the pregnancy, delivery and neonatal period normal?* Consider uncommon causes of sensorineural hearing loss, both hereditary and acquired.
- *Previous medical history.* Special risk factors such as Down syndrome, cleft palate or learning difficulties may modify the approach to management.
- *Family history of hearing loss.* A child with OME will occasionally have an underlying sensorineural hearing loss.

- *Social history.* Parental smoking should be discussed and discouraged as a contributory factor in childhood chronic middle ear disease.⁵

What you should cover on examination

- Clinical examination of the tympanic membranes with good quality halogen otoscopy may confirm a clinical diagnosis of OME. Pneumatic otoscopy is diagnostically reliable in experienced hands. Loss of the light reflex, dullness, amber-gold colouration of the tympanic membrane because of middle ear effusion are all common findings when a middle ear effusion is present. The apparent more horizontal appearance of the malleus that is often seen, results from negative middle ear pressure drawing the long process of the malleus medially. Attic retraction or atelectasis of the tympanic membrane may be visible. These findings do not necessarily indicate a more severe or persistent type of OME, and are not absolute indications for urgent surgical intervention.
- Complete a routine paediatric ENT examination of the nose, pharynx and neck.

Investigations

- Tympanometry will confirm clinical findings. Tympanometry alone is a useful screening tool, and when used as a first test will reduce the audiometric workload to 69%, but still identify 95% of the hearing impaired children.⁶ It will, however, fail to detect the 0.1–1.0% of children with a sensorineural hearing loss.
- Age-appropriate hearing testing. (Where possible, both air and bone thresholds). Below 4 years of age, pure tone headphone audiometry may not be possible and other techniques such as visual reinforced audiometry should be used. In peripheral clinics where there may not be full paediatric audiology facilities, refer back to the community audiology clinic for a follow-up assessment in 3 months time.

What treatment you should offer

The history and clinical findings on otoscopy of OME, supported by bilateral hearing thresholds of 25 dB or worse and B+ B or B+ C₂ tympanograms confirm the

diagnosis of OME on the day of examination. Further management depends on the duration of the hearing loss and any other special risk factors. Without treatment, the natural history of OME in childhood is one of predominant spontaneous resolution. Watchful waiting with monitoring of hearing over a 6-month period will result in spontaneous resolution of the OME in over 90% of children.² This strategy does, however, assume that early specialist referral and timely surgical intervention will be available when required.

Summary of management

- Unilateral OME – watchful waiting with monitoring of hearing.
- Bilateral OME with hearing in one ear better than 25 dB HL – watchful waiting with monitoring of hearing.
- Bilateral OME with hearing in both ears 25 dB HL or worse – consider surgical treatment after failed watchful waiting of three months or more. A longer period of watchful waiting may be appropriate in younger children.
- Explain the natural history of OME and the high rate of spontaneous resolution. There is evidence that traditional medical treatments, such as antihistamines, decongestants or antibiotics are ineffective in producing long-term resolution of OME.⁷ There is no evidence to support the efficacy of ‘complementary medicine’, such as cranial osteopathy, homeopathy or aromatherapy, for OME.
- Nasal auto-inflation of the Eustachian tubes may produce benefit if used regularly. The drawback of this simple treatment is the inability of young children to use a nasal balloon and the three or more times daily treatment regimen resulting in poor compliance and adherence. An automated, battery operated version of this treatment (the *Earpopper*[®]) is also available. The long-term benefits of nasal auto-inflation are uncertain.
- There have been no randomized trials of hearing aid versus other treatments for OME. In a small UK study of 48 children with OME, compliance by the children issued with a hearing aid was high. However, 13% of children continued to use the hearing aid in the affected ear after the OME had resolved.⁸
- Surgical treatment is recommended where resolution has not occurred over a 3–6 month period and there is a persistent hearing impairment with associated disability. Insertion of grommets produces considerable immediate improvement in hearing but this averages out to only modest measurable benefits, to hearing for up to a year following surgery. The large benefits observed and reported by parents are at odds with the modest short-term benefits measured in well-designed scientific studies. In children over the age of 3, the UK TARGET trial has

shown very small benefits in developmental variables, including speech and language, behaviour and child quality of life in the 2-year period after surgery. There are, however, considerable benefits, particularly from adenoidectomy to hearing level and to physical health including sleep pattern, and an evidence base for selective targeting of these latter benefits. (*Haggard MP, personal communication*).

- The *extra* benefits of both types from adenoidectomy are small yet reliable even through the first 6 months when grommets are in place. The benefit of adenoidectomy assumes importance when the grommets extrude. The American Academy of Pediatrics 2004 Guideline recommended against adenoidectomy in children undergoing VT surgery for the first time for OME.⁹ However, the TARGET results show that in the child over 3 years with OME, the combined operation of grommets plus adenoidectomy delivers over a 2-year period about three times the extent of benefit delivered by short-stay grommets alone.
- Discuss the possible anaesthetic and surgical complications of grommet and adenoidectomy surgery, including post-operative adenoidectomy bleeding, (approximately 0.5%), otorrhoea, premature grommet extrusion, myringosclerosis, atelectasis, persistent perforation and unlikely but possible sensorineural hearing loss. There are no published mortality figures for adenoidectomy or grommet surgery alone.
- Finally, reassure parents that for most children with OME, particularly those younger children under the age of 3 years, watchful waiting and monitoring of hearing, usually over 3 months is effective.¹⁰ For those who fail watchful waiting, surgical treatment is generally safe and is effective, at least in the short-term. Arrange follow-up hearing review and be able to offer a timely admission date for surgery, if indicated.

Conflict of interest

None declared.

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