Management of otitis media with effusion in children

Zulkiflee S, Siti Sabzah MH, Philip R, Mohd Aminuddin MY, on behalf of the Development Group of Management of otitis media with effusion in children.

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Authors

CPG Secretariat
(Corresponding author)
Health Technology Assessment Section, Medical Development Division, Ministry of Health,Malaysia.
Telephone: +60388831245 or 1481
email: htamalaysia@moh.gov.my

Zulkiflee Salahuddin
Head of Department & Consultant Otorhinolaryngologist (Otology)
Hospital Raja Perempuan Zainab II, Kota Bharu, Kelantan
Email : zulkiflee97@yahoo.com.sg

Siti Sabzah Mohd. Hashim
Head of Department & Senior Consultant Otorhinolaryngologist (Paediatrics ORL) Hospital Sultanah Bahiyah, Alor Star, Kedah
Email: dr_ctsabzah@yahoo.com

Philip Rajan
Otorhinolaryngologist (Otology)
Hospital Raja Permaisuri Bainun, Ipoh, Perak
Email: prajan333@yahoo.com

Mohd. Aminuddin Mohd. Yusof
Head of CPG Unit
Health Technology Assessment Section
Ministry of Health
Email: am2dr@yahoo.com

Introduction

Otitis media with effusion (OME) is a condition characterised by a collection of fluid within the middle ear without signs of acute inflammation. It is common in young children, with a bimodal peak at two and five years of age. Eighty percent of children have at least one episode of OME by the age of 10 years. This disease is a common ear problem among children with craniofacial anomalies including cleft palate and Down syndrome (DS).

While most cases of OME will resolve spontaneously, it may persist in some children. The main symptom of OME is hearing impairment. This condition is often underdiagnosed, leading to untreated hearing problem, which can cause speech and language developmental delay and poor school performance.

Risk Factors

Risk factors of OME can be divided into non-medical and medical risk factors. Significant non-medical risk factors includes age (two to five years old), large family size, sibling's history of OME, short duration of breast feeding and passive smoking. While significant medical risk factors are previous history of acute otitis media (AOM), acute tonsillitis, nasal obstruction and craniofacial anomalies.

Clinical Presentation

OME results in conductive hearing loss. The presentation is related to auditory impairment and its effects.

OME should be ruled out in a child with any of the following symptoms:

- hearing impairment,
- speech or language developmental delay,
- associated presentation such as recurrent otalgia, upper respiratory tract infection or AOM, poor school performance, lack of concentration or attention, and balance difficulties

Hearing assessment should be emphasised in the existing routine child developmental assessment to detect hearing loss. The assessment may include distraction test, auditory and speech development, and otoacoustic emission.

Diagnosis

Otoscopy should be performed in suspected cases of OME. Pneumatic otoscopy is preferred and should be made widely available. Differences in clinical features and otoscopic findings between OME and other common middle ear diseases are illustrated in the following table.

Table 1. Clinical features in middle ear diseases

	Pain	Fever	Otorrhoea	Otoscopic findings
OME	No (unless with secondary infection)	No	No	• Dull tympanic membrane (TM) • Retraction of • Air-fluid level or air bubble • TM colour change • Restricted TM mobility with pneumatic otoscopy
AOM	Yes	Yes	Yes	• Bulging TM • Inflammed TM
Chronic suppurative otitis media	No	No	Yes	• Perforated TM • Mucopurulent discharge
Cholesteatoma	No	No	Yes (scanty, foul smelling, persistent)	• Attic or marginal perforation of TM • Presence of keratin debris

In centres with trained personnel where audiological facilities are available, the following tests should be performed: tympanometry (in infant less than seven months, high frequency tympanometry [678 Hz or 1000 Hz] should be used if available) and pure tone audiometry (measurement of both air and bone conduction thresholds).

Management

Management of OME is divided into non-surgical and surgical interventions (refer to Algorithm 1). Non-surgical intervention consists of active observation, medical therapy, autoinflation and hearing aids.

OME is usually mild with spontaneous resolution occuring in majority of cases at three months. However, it can be recurrent and persistent after that. Non-surgical intervention is beneficial if it could speed the resolution of an episode of OME.

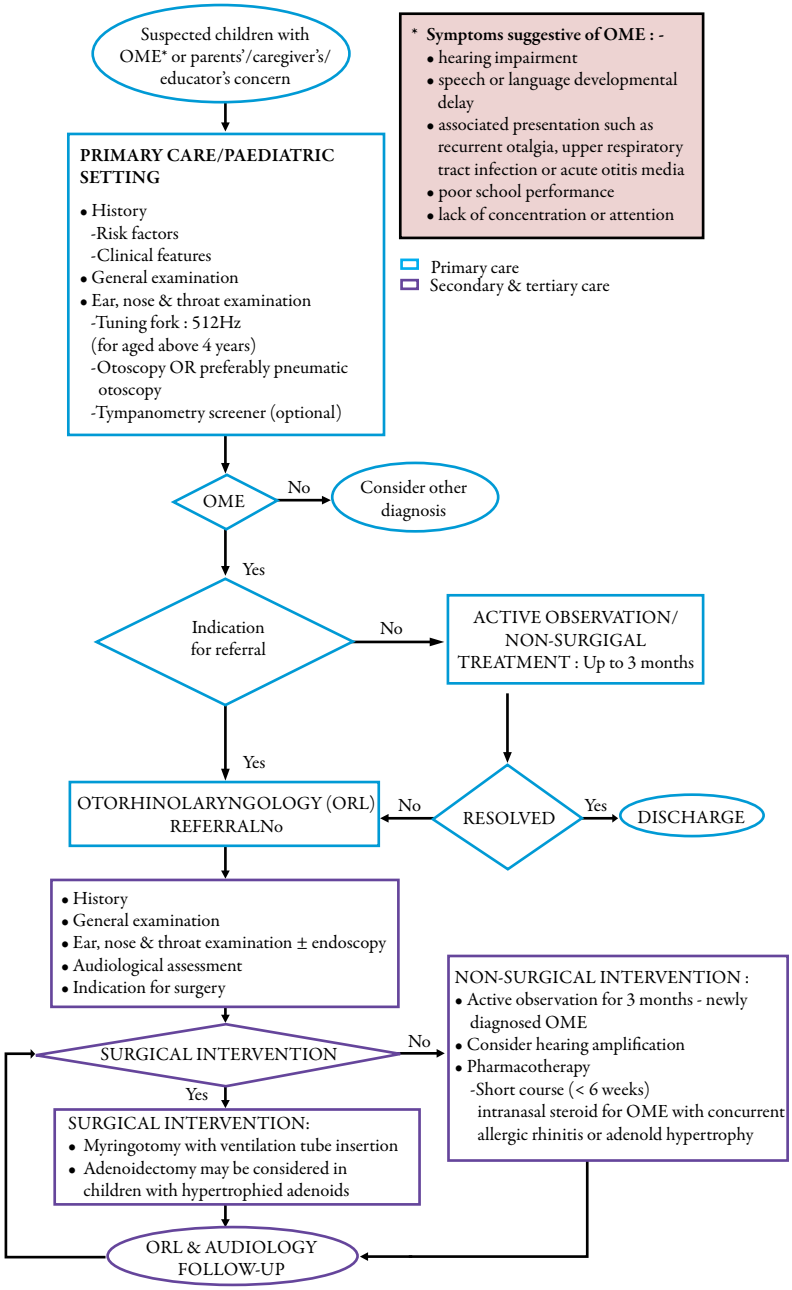
Active observation is a period whereby a newly-diagnosed OME case is being observed for three months following diagnosis prior to surgical intervention. It refers to educational and behavioural strategies to minimise impact of hearing loss before surgical intervention is considered. This includes facing the child when speaking, getting the child's attention before starting to talk, reducing background noise to the minimal, speaking clearly with normal rhythm and volume, using visual cues (such as hands and pictures) in addition to speech, reading to or with the child (explain pictures and ask questions), repeating words, phrases, and questions when misunderstood, and placing the child near the teacher in the classroom.

Criteria on referral of OME cases to an otorhinolaryngologist are listed in the Table 2.

Table 2. Criteria for referral

- Hearing impairment or hearing loss due to uncertain causes
- Recurrent episodes of acute otitis media or otalgia
- Speech and language development not appropriate for age
- Impaired social or educational development and behavioural symptoms (lack of concentration or attention) associated with hearing impairment
- Underlying craniofacial anomalies, DS and cleft lip and/or palate
- Otoscopic findings such as colour changes, opacity or retraction of TM and presence of fluid level or air bubble persisted after three months of active observation
- Children with persistent OME after active observation for three months
- Presence of cholesteatoma requires URGENT REFERRAL

Algorithm 1: Management of otitis media with effusion in children (primary care)



Short-term (less than six weeks) intranasal steroid can be used for OME with concurrent allergic rhinitis and adenoid hypertrophy. Oral steroids, prolonged intranasal steroids, antibiotics, antihistamines/decongestants, autoinflation, homeopathy and mucolytics are not recommended. There is no role of topical ear drops in treating OME.

Hearing aids may be considered in persistent bilateral OME and hearing loss where surgery is contraindicated or not acceptable.

The main reason for considering surgery in OME is persistence of hearing loss. It is performed to improve hearing and minimise the risk of OME recurrence. The choice of surgical intervention must be balanced between its risks and benefits. Certain medical diseases such as a bleeding disorder and other

medical conditions which render patient unfit for general anaesthesia should be ascertained prior to surgery.

Surgical intervention should be considered after three months of persistent OME in children with hearing loss >25 dB (at three frequency average) and/or structural changes to the tympanic membrane or middle ear. Myringotomy with VT insertion is the procedure of choice and it is a safe procedure. In addition, combined adenoidectomy should be considered in children with persistent OME and hypertrophied adenoids abutting the torus tobaris.

Recurrence of OME is part of the disease process which may occur at any point of time and not a complication of VT insertion. Advices to patients with post-VT insertion are:-

- Keep ear dry
- Use ear plug when swimming or bathing (especially when washing hair using shampoo or soap)
- Do not insert object into the ear

Follow-up

Children with OME should be followed-up for otological and audiological assessment regularly. In those post-ventilation tube insertion, follow-up should be done within the first month of surgery and six-monthly after that till recovery. The presence of either otorrhea, TM retraction, TM perforation or persistent hearing loss requires otorhinolaryngology consultation.

Prevention of OME

Pneumococcal vaccination has no role in preventing OME as opposed to acute otitis media. Influenza vaccination is effective in preventing OME in temperate countries. Parents should be informed that breast feeding for six months may reduce the risk of OME in their children while smoking may increase its risk.

Management of OME in Cleft Palate and Down syndrome

All children with cleft palate or DS should be managed by a multidisciplinary team. Hearing assessment should be performed early and six-monthly in these children.

Early ventilation tube insertion should be performed at the time of palatal repair in cleft palate or cleft and lip palate infants with auditory brainstem response threshold level of ≥25 dBHL and after ontological assessment. Hearing amplification may be considered as an option in cases of mixed (conductive and sensorineural) and moderate hearing loss in children with cleft palate.

Hearing amplification should be considered in children with DS who have OME and either a stenotic ear canal, mixed hearing loss or as an alternative to VT where necessary. VT should be considered in DS with OME after weighing its risks and benefits.

Acknowledgement

Details of the evidence supporting these recommendations can be found in the CPG on Management Of Otitis Media With Effusion In Children, available on the following websites: Ministry of Health Malaysia: http://www.moh.gov.my and Academy of Medicine: http://www.acadmed.org.my. Corresponding organisation: CPG Secretariat, Health Technology Assessment Section, Medical Development Division, Ministry of Health Malaysia & contactable at htamalaysia@moh.gov.my