Management of Common Otological Diseases at a Peripheral Medical Set Up

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MJAFI 2003; 59 : 332-336

Key Words : Furunculosis; Otagia; Otitis media; Otomycosis; Secretory otitis media

Acute Otitis Media

It is one of the commonest otological conditions encountered by Medical Officers. It is important to recapitulate the pathophysiology of the condition for a broader understanding of principles of management and suitable preventive / pre-operative advice to patients.

Pathophysiology : It is more common in children due to :

- Reduced immunity of the children to infections, particularly at the age of school entry - when they are exposed to other children harbouring various infections.
- The Eustachian tube, which connects the nasopharynx to the middle ear is much shorter, relatively wider and more horizontal. Hence, upper respiratory tract infections alone or in association with tonsillar, nose or sinus infections and regurgitated milk can easily travel upwards to the middle ear and lead to acute otitis media [1].

Infections are usually viral to start with but common organisms like *Streptococci*, *Haemophilus influenzae*, *Pneumococcus* etc., secondarily invade the middle ear. The occlusion of nasopharyngeal end of the Eustachian tube due to inflammatory oedema leads to absorption of air in the middle ear and exudation/transudation of fluid. As the volume of this infected fluid increases, so do the manifest symptoms of heaviness, pain and pyrexia - till the host resistance is overcome, suppuration in the middle ear fluid sets in, resulting in 'pointing' or bulging of a segment of tympanic membrane. With clinical acumen for an early diagnosis and correct interventional measures, the pathological process which may vary between few hours to two days, can be stalled decisively. If the patient reports late or the diagnosis is missed, rupture of tympanic membrane results with resolution of acute symptoms. Later, some of these cases continue to have chronic otitis media while in others the membrane heals spontaneously.

Clinical features : An upper respiratory tract infection / 'cold' usually precedes acute otitis media. The patient may have features of acute/residual sinonasal/throat infection - he may be pyrexial and complain of blocked feeling/pain in the ear - the symptoms/signs varying according to the stage at which he presents - catarrhal or suppurative. At the catarrhal stage, the tympanic membrane (s) are retracted with loss of light reflex, mildly congested with predominant malleolar congestion. Later, the congestion spreads across the entire tympanic membrane (Fig - 1). In an impending rupture, the patient is very restless, will cry for relief and the membrane will bulge, usually postero-superiorly. Tuning fork tests will show mild to moderate conductive hearing loss in the affected ear. No special investigations are required at this stage - if the membrane has ruptured, an aural swab must be taken for culture and antibiotic sensitivity test.

Treatment

- Antibiotics : At the catarrhal stage, if it is mild, one should avoid antibiotics. Start oral antibiotics at the earliest suspicion of suppuration which may escalate a clinical appreciation that will only increase with experience. Oral/injectable antibiotics like Ampicillin/Amoxycillin/Augmentin, if the condition so demands, may be given parenterally for 24 hours, then orally for 7 days in the appropriate dosage consistent with the age of the patient.
- Oral and local decongestants with anti-inflammatory drugs for 3-5 days.
- If the pain increases and the tympanic membrane bulge increases, a myringotomy at an ENT centre is advisable. In case of otorrhoea, local antibiotic-steroid ear drops (eg. gentamycin+hydrocortisone) instillation thrice daily should be advised for one week.

Furuncle of external ear

Pathophysiology : A furuncle of external auditory

Fig. 1 : Appearance of tympanic membrane in acute otitis media

meatus is a *Staphylococcal* infection of the hair follicle(s) and as these hair follicles are confined to the outer one-third of external auditory meatus, furuncles naturally are seen in this area only. They may occur as single/multiple lesions and may recur in diabetics or debilitated individuals. Damaging the integrity of external auditory meatus skin by self-cleaning efforts with different objects (pins/pens/rather large sized commercial buds), especially after swimming, is a definite predisposing factor.

Clinical features : Patient may present at a very early stage i.e. folliculitis with a very clearly localized mild pain. If the infection does not spread/escalate, all that is required is local application of Ung Neosporin/Soframycin cream.

A patient with well developed furuncle will present with severe ear pain and local tenderness, which is out of proportion to the apparent size of the furuncle. Movements of jaw and pinna and instrumentation are painful. It is important to differentiate between a posterior meatal furunculosis and early mastoiditis. Some of the important differentiating clinical features are as follows:

- A history of a recent upper respiratory tract infection /'cold' or previous otitis media with recent otorrhoea suggests a middle ear pathology.
- Mucoid or mucopurulent discharge suggests chronic suppurative otitis media whereas purulent discharge occurs in a furuncle which has drained spontaneously with relief of pain.
- Movements of pinna and jaw are painful in furunculosis.
- Maximal tenderness, in furuncle, occurs over the tragus and anteromedial to the lobe of the ear, whereas in mastoiditis, it is present over the posterior border of mastoid process.
- Tuning fork tests are normal in furuncle of external

auditory meatus unless it totally occludes the external auditory meatus when conductive deafness may result. In mastoid infection, there is conductive deafness (Rinne test negative, Weber lateralised to affected ear, Absolute Bone Conduction being normal).

- Most importantly, otoscopic examination in furunculosis is generally possible, with a smaller ear specula inserted beyond the inflamed external auditory meatus and a normal tympanic membrane leaves the diagnosis in no doubt. Presence of otorrhoea and general symptoms (fever, malaise), sagging of the posterosuperior meatal wall, and an abnormal tympanic membrane (congestion/perforation with active discharge) indicates mastoid infection.
- A radiograph of mastoids (Schuller's view) is rarely required to differentiate. In mastoiditis, there will be breakdown of cell walls of mastoid air cells with cloudiness or haziness of mastoid.

Treatment

- Clear the ear of discharge/debris beyond the furuncle with warm normal saline syringing.
- External auditory meatus should be gently packed with a half inch (12 mm) broad gauze wick of adequate length soaked in 10% Icthammol glycerine, if available, or smeared with Ung Neosporin/Betadine. The wick should extend beyond the furuncle so that adequate splintage is provided. Change this pack daily till the condition settles.
- Start Erythromycin/Roxithromycin/Flucloxacillin in full, appropriate dosage for 5 days. Anti-inflammatory drugs may be given for 3 days.
- Do not incise the furuncle unless "pointing".
- Advise suitable skin/nail hygiene and to avoid ear self-cleaning. In recurrent furunculosis, do prescribe local Ung Neosporin application for the nasal vestibule for 2 weeks to minimize staphylococcal transmission to the ear due to nose picking.

Otitis Media with Effusion/Secretory Otitis Media

We as doctors will continue to see patients who present with significant deafness since many years, patients who when spoken to loudly respond adequately. These patients may have intact tympanic membranes - but these are retracted/severely retracted or the tympanic membranes may be scarred and immobile. These cases are the classical end result of neglected Otitis Media with effusion (synonyms : Secretory Otitis Media/glue ear), a condition which is very common in childhood. Otitis Media with effusion is an insidious

condition characterized by accumulation of non-purulent, serous/viscid, generally sterile fluid in the middle ear [2]. This effusion occurs due to increased secretory activity of middle ear mucosa (more goblet and mucus cells) and eustachian tube dysfunction.

Aetiology

- Eustachian tube dysfunction - may occur due to adenoid hyperplasia, chronic adenotonsillitis, chronic rhinitis and sinusitis (of infective/allergic nature) or palatal defects. Rarely, tumours of the nasopharynx in an adult may present with unilateral middle ear effusion.
- Inadequately resolved otitis media.
- Viral upper respiratory tract infections.

Clinical features : It's common in children below 10 years of age. Hearing loss of moderate severity, mild, recurrent ear pain and a blocked feeling of the ear, are the usual presenting complaints. The hearing loss may occur in infancy leading to a delayed speech acquisition or the child may be school going and brought because of suspicion of deafness by teachers/parents as the child's oral work is poorer than his written work. If it's of recent onset, the patient may have features of residual upper respiratory tract infection/sinusitis. Otoscopic examination in the early stages will reveal a dull red, mildly congested, retracted tympanic membrane with loss of light reflex and decreased mobility. A retracted tympanic membrane depending on the degree of retraction will have following features - loss of light reflex, prominent lateral process of malleus, prominent sickle shaped anterior/posterior malleolar folds, foreshortening of handle of malleus which thus appears more horizontal while late case may show indrawing and draping of tympanic membrane over the incudo-stapedial joint postero-superiorly [3]. A thin leash of blood vessels may be seen along the handle of malleus or scattered radially peripherally - giving the tympanic

Fig. 2 : Serous otitis media with its characteristic findings

membrane a 'cartwheel' appearance. The congestion of the tympanic membrane and the associated symptoms are mild as compared to the marked generalised congestion of acute suppurative otitis media. Fluid level may be seen in the middle ear, if fluid is serous with air bubbles, if Valsalva's manoeuvre is possible (Fig 2). In the late/chronic stages, the tympanic membrane is dull, markedly retracted and immobile. Tuning fork tests/audiometry show conductive deafness, while impedance audiometry shows reduced tympanic membrane compliance and a flat curve with significant negative middle ear pressure (-200 daPa or less).

Treatment

Early stages

- With coexisting upper respiratory tract infection/inadequately resolved otitis media start antibiotics Amoxycillin/Augmentin in adequate dosage for 5-7 days.
- Systemic and topical nasal decongestants should be given.
- Antihistamines should be given for 2 weeks at least.
- Middle ear aeration through repeated Valsalva manoeuvre. Children can be given balloons to inflate or given chewing gum to encourage repeated swallowing movements which open the eustachian tube.
- Follow up the child for 2 months at least.

Late stages : When fluid is thick/viscid and medical treatment does not help much over 3-4 weeks, the patient should be referred to an ENT centre where the fluid is evacuated through myringotomy. In cases of chronic, recurrent otitis media with effusion, grommet insertion is done for continued aeration of middle ear while simultaneously tackling the causative factor, for example adenotonsillectomy.

Sequelae : The disease does appear to burn itself out by puberty when the tympanic membrane may be scarred and retracted but there is no fluid. Prolonged viscid effusion with eustachian tube dysfunction can lead to thinning out of tympanic membrane, atelectasis (collapse) of middle ear, tympanosclerosis, retraction pockets or ossicular necrosis. The importance of early diagnosis and management of otitis media with effusion, therefore, cannot be simply over-emphasized.

Otomycosis

Fungal infection of the external auditory meatus is commonly due to *Aspergillus niger/fumigatus* or *Candida albicans*. It is common in hot and humid climate, especially in North-East India and may be seen more after a recent swim.

The cardinal features are ear discomfort/pain, intense itching and a feeling of a 'wet' ear with a blocked sensation. Otoscopy reveals congestion and oedema of meatal skin. At the early stages of infection, dry fungal growth can be clearly seen (white/black spores of *Aspergillus* infection) or there may be a creamy deposit (*Candida* infection). At a later stage, one will see dirty white debris akin to a wet blotting paper filling up the entire canal over an inflamed meatal skin (Fig 3).

Treatment

- The fundamentals of treating any external ear disease by thorough ear toilet are very valid here. The debris is removed by syringing/suction/mopping and the external auditory meatus and tympanic membrane is again inspected. This is essential because occasionally, an acute otitis media/chronic suppurative otitis media patient with pulsatile discharge through a small or moderate sized perforation may present with a fungal infected debris in the external auditory meatus.
- Once the external auditory canal is reasonably well cleaned and mopped up, 3% salicylic acid in rectified spirit or 70% alcohol ear drops (both thrice daily) which are available or can be prepared in any Medical Inspection Room should be prescribed. Alternatively, a Clotrimazole/Tolnaftate/Fluconazole preparation should be given. It is advisable not to prescribe a combination of antibiotic/steroid ear drops in otomycosis however, these may be used in diffuse otitis externa due to chemicals used for swimming pool hygiene.
- The patient must avoid water entering the ear.
- It is essential to follow up these cases closely and frequently for suitable ear toilet and local applications. The ear drops which are beneficial should be continued for 7-10 days after apparent cure.

Fig. 3 : Otomycotic debris with spores seen

Foreign Bodies in the Ear

This is one of the commonest conditions in a peripheral medical set up as small children are fond of inserting anything and everything possible into the ears - grains of wheat/pulses, rubbers, metal or plastic beads/objects, stones, paper, cotton-even ball pen tops! Or these foreign bodies may enter external auditory canal accidentally eg. insects. After the 'Holi' festival, 'gulal' may discolour the external auditory meatus abnormally for many weeks.

Clinical presentation : The child is generally brought by the parents who have seen him insert the foreign body or have been told about the incident. Live insects due to crawling, constant fluttering or biting make the patient, extremely restless and will ensure early presentation. Vegetable foreign bodies like seeds, grains etc, if neglected for 3-4 days, can present with otalgia and otorrhoea.

Diagnosis : This is usually easy from history and otoscopic examination.

Treatment

- Live insects : (i) If the Medical Officer has to handle the case in an unorganized/remote place, some unconventional measures may be initially tried-darken the room, pull the pinna postero-superiorly and throw a bright light (torch/emergency lamp) onto the meatus from about 15-20 cm distance. The insect usually crawls out. (ii) Alternatively, drown the insect by instilling glycerine/liquid paraffin/sodabicarbglycerine. Later, clean the ear thoroughly by syringing and dry mopping.
- Do not attempt to hold hard objects (metal/plastic beads, stones, rubber pieces etc) with whatever forceps is at hand. If the object is not fully occluding the meatus it's better taken out by syringing through the available space so that the foreign body is pushed out or hooked out by a Jobson-Home probe.
- Loose objects with free edges like paper, insects/cotton plugs can be easily extracted with forceps.

Impacted Wax/Cerumen

Wax or cerumen is secreted by ceruminous glands which are modified sweat glands present in the external auditory meatus. It has useful functions in that it lubricates ear canal, entraps foreign bodies and has an antibacterial action. In normal individuals small amount of wax is secreted which dries up into flakes or a small ball which is expelled spontaneously by epithelial migration or movements of jaw. However, accumulation of wax forms a solid, hard mass, brown or yellowish in colour which is called 'Impacted wax'. Some people are predisposed to excessive wax secretion. This

associated with certain other factors like tortuous, narrow canal, stiff hair and narrowing of ear canal due to obstructive lesions leads to impaction of wax.

Clinical features : Impairment of hearing or sudden blocked feeling after a bath, discomfort in the ear, tinnitus and transient disturbance of balance due to pressure of the wax on the tympanic membrane are the usual symptoms.

Treatment

- a. Syringing : Sterile saline solution or boric lotion (1:40) warmed to body heat are employed. Pinna is pulled upwards and backwards and a stream of water from an aural syringe is directed along the postero-superior wall of the meatus. If an aural syringe is not available, a 50 cc syringe with a distal 4 cm cut end of an infant feeding tube attached can be used.
- b. Removal by instrumental manipulation : Cerumen hook, scoop or a Jobson Horne probe may be used.
- c. Wax solvents : If above methods fail, impacted wax can be softened by 2% sodabicarb in equal parts of glycerine and water, liquid paraffin, olive oil and various other commercial preparations made of turpentine oil derivatives instilled two or three times a day for few days. This softened wax can be later hooked out, dry mopped or syringed.

Otalgia

Pain in the ear may arise from the lesions of auricle, external auditory meatus or middle ear and mastoid, or it may be referred from lesions of other anatomical structures closeby.

Lesions pertaining to ear : Trauma to auricle/tympanic membrane, impacted wax, furuncle of external canal, otomycosis, otitis externa, acute otitis media, chronic suppurative otitis media with effusion, acute mastoiditis etc.

Lesions causing referred otalgia : Carious tooth, acute tonsillitis or peritonsillitis, post adenoidectomy or post tonsillectomy, lesions of soft palate (eg. aphthous ulcers), epiglottitis, temporo-mandibular joint disorders/malocclusion etc. History and a careful examination will often provide leads to the exact cause.

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