A CLINICAL STUDY AND MANAGEMENT OF OTITIS MEDIA WITH EFFUSION IN CHILDREN

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ABSTRACT One of the children’s most prevalent chronic otological problems is otitis media with effusion (OME). By the age of three, two-thirds of children have had at least one episode of OME, and one-third are asymptomatic.1 Most commonly, hearing loss, delayed speech and language development and poor social conduct in younger children are seen in the pediatric population2. Surgical treatment consists of myringotomy and grommet (ventilation or tympanostomy tube) insertion coupled with removing the underlying cause as and when indicated.3 This study was thus undertaken to study the prevalence of otitis media with effusion in children and to assess the improvement in symptomatology after a tympanostomy tube insertion. Material and methods: Patients were selected for the study based on their otoscopy, audiometry and tympanometry findings. Also, an X-ray skull lateral view was considered to establish a relationship with obstructive adenoid disease. Results: Eustachian tube dysfunction was the most common predisposing factor found in 58% of the patients, followed by allergy found in 30% of patients, cleft lip in 6% of patients. As observed from our study, Eustachian tube dysfunction was the most common predisposing factor leading to OME. Conclusion: The combination of treatment in the form of myringotomy with grommet insertion vis-à-vis adenoidectomy with myringotomy and grommet insertion has it’s merits and demerits.

KEYWORDS paediatric otology

Aim 
To study the prevalence of otitis media with effusion in children and determine the underlying pathophysiology leading to OME.

Introduction
One of the children’s most prevalent chronic otological problems is otitis media with effusion (OME). By the age of three, two-thirds of children have had at least one episode of OME, and one-third are asymptomatic.2 Geographic and racial differences influence the prevalence of the disease. Anatomic abnormalities in the skull base and Eustachian tube are hypothesized to be the cause of the increased incidence in particular populations.3

Adenoid hypertrophy has been proved to be the most important etiological factor. Clinically, the patient may have mild to moderate conductive hearing loss (HL) ranging from 20 to 30 decibels with 0 to 50 decibels HL. When the condition is bilateral and has lasted for several months, the hearing loss may be severe. OME is more common in children with anatomical anomalies such as cleft palate or craniofacial problems.4 The underlying problem causing tubal dysfunction in children with cleft palate is an aberrant action of the tensor palati muscle.5 The failure or improper insertion of the tensor veli palatine muscle to the lateral Para tubal cartilage is assumed to cause the Eustachian tube’s dysfunction.

Patients in our study were initially given a medical line of management before being taken up for a surgical procedure which consists of myringotomy with grommet insertion or adenoidectomy with myringotomy and grommet insertion.

Materials and methods
A total of 50 patients were planned for the study.

The study population will include patients diagnosed with otitis media with effusion. The criteria for selection are as follows:
### Table 1 Age Distribution

| Age   | No of patients |
|-------|----------------|
| 5     | 7              |
| 5-10  | 29             |
| 10-15 | 14             |

The demographic profile shows that the most common age group is 5-10 years.

### Table 2 Sex distributions

| Sex | No of patients |
|-----|----------------|
| M   | 24             |
| F   | 26             |

### INCLUSION CRITERIA

1. Age above the age of 5 years and below the age of 15 years
2. With or without adenoids
3. Recurrent episodes of otitis media with effusion
4. Patients with ASA physical status I or II.
5. Patients with type B curve on impedance audiometry.

### EXCLUSION CRITERIA

1. Patients with tympanic membrane perforation
2. Patients below the age of 5 years and above 15 years.
3. Patients with ASA physical status III.
4. Patients with a history of previous ear surgery
5. Patients with sensorineural deafness

All patients fitting in the operative definition of the study and fulfilling the inclusion criteria will be considered for the study, and an adequate history was recorded. Examination of patients was initially done with a pneumatic otoscope, followed by examination with Siegel’s speculum and confirmed with examination under an operating microscope, and the findings were noted as follows:

1. Normal tympanic membrane or a retracted tympanic membrane with a distorted or absent cone of light.
2. Bulging /lusterless and dull tympanic membrane
3. Mobility of tympanic membrane

A nasal, oral cavity examination was also performed. The clinical diagnosis was established using otoscopy, pneumatic otoscopy, otomicroscopy, pure tone audiometry and tympanometry. An X-ray skull lateral view was done to look for adenoid hypertrophy in all cases. All identified subjects who fulfilled the inclusion criteria outlined were included in the study. Any predisposing factors for otitis media with effusion if present, were noted.

Hearing thresholds were measured using pure tone audiometry showing the degree of hearing loss. Impedance audiometry was used to assess the status and mobility of the tympanic membrane. Middle ear effusion is diagnosed using Tympanometry, and following a tympanostomy, Ventilation tubes were inserted subsequently on a case-to-case basis.

Surgical management includes:

1. Myringotomy with grommet insertion.
2. Adenoidectomy with grommet insertion.

### Results

Our study is a prospective analysis of incidence, predisposing factors, clinical presentation and the surgical outcome of otitis media with effusion conducted in the Department of ENT and Head and neck surgery of a tertiary care hospital.

In the study population (50 patients), 48% were male (24 patients), and 52% (26 patients) were female, and there was no significant difference between the sexes in any age group.

Eustachian tube dysfunction was the most common predisposing factor found in 58% of the patients, followed by allergy found in 30% of patients, cleft lip in 6% of patients. Though GERD is a major risk factor for otitis media with effusion, we did not encounter any patients with GERD.

Our patients were initially managed conservatively with a course of Amoxicillin + clavulanic acid combination and cetirizine with ambroxol. Those who did not respond satisfactorily to medical management were subsequently subjected to surgical procedures (myringotomy with grommet insertion and adenoidectomy with grommet insertion). Only 10 patients with only borderline retraction with non-resolution of symptoms following medical management and the two patients with cleft palate were subjected to only Myringotomy with grommet insertion. Patients with cleft palate were not subjected to adenoidectomy to prevent subsequent velopharyngeal insufficiency. The remaining 29 patients were subjected to adenoidectomy and myringotomy with grommet insertion.

Both Gates et al. and Paradise et al. have both demonstrated the effectiveness of adenoidectomy in managing secretary otitis media. Other clinical studies have also concluded that adenoidectomy was independent of adenoid size. The other classic rationale in their study is improvement in Eustachian tube function. Similarly, in another study conducted by Honjo, patients showed improvement in equilibration of positive middle ear pressure after adenoidectomy. Obstruction of the Eustachian tube is either anatomic or functional is a logical rationale for the procedure.
Table 3 Predisposing factors

| Predisposing Factors     | Number of patients |
|--------------------------|--------------------|
| Et Tube Dysfunction      | 29                 |
| Allergy                  | 15                 |
| Cleftlip Or Cleft Palate | 2                  |
| Gerd                     | 0                  |

Table 4 Treatment

|                      | Medical management | Surgical Management |
|----------------------|--------------------|--------------------|
| Number of Patients   | 11                 | 29                 |

Discussion

In our study, around 58% of the patients were between the age group of 5 and 10 years, and there were varying stages of acuity of symptoms. However, predominantly more in 4.5 to 5 years which was comparable to a study conducted by Zielhius et al.⁹ wherein they used tympanometry for diagnostic purposes to derive age-related prevalence and discovered that there is a bimodal prevalence, with the peak first occurring at the age of two years and later at 4 years.

Our study’s gender difference in representation was marginally more for males; boys (58%) showed a higher incidence than girls (42%). This factor was akin to a study conducted by Ozlem, Munir et al. Our study was conducted in Pune throughout the year, while studies done abroad have stated that secretory otitis media has a higher prevalence in temperate climates than in summer, according to Tos et al.¹⁰

We observed that ET dysfunction was the most common predisposing condition seen in 58% of our study group, followed by allergies (38%) and cleft lip (4%), which matched with research by Bluestone and Klein ¹¹ in 2001, which concluded that ET dysfunction was the most common predisposing factor responsible for OME in children. These studies demonstrate that the insertion of grommets/ventilation tubes in patients with Otitis Media with Effusion is associated with considerable improvements in hearing.

Amongst all patients taken up for surgical treatment in the study, 71% of the patients showed a significant decrease in the air-bone gap with AB gap less than 10 db as compared to preoperative values, 68% of the patients had TM revert to normal, and 18% of patients had grommet insitu and 14% of the patients still had a retraction. Patients had extrusion of grommets at different intervals of time.

Conclusion

The most pertinent conclusion of this study, noted from the time we started selecting subjects for the study, was that OME diagnosed and treated on time resulted in almost near-normal hearing with virtually no residual handicap. However, those who did not seek treatment on time or did not take treatment at all suffered from subsequent after effects, some of which were irreremediable.

Besides a timely diagnosis, another essential aspect is the modality of treatment offered to the patient depending upon the gravity of the condition thus the combination of treatment in the form of myringotomy with grommet insertion has it’s merits and demerits.

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