

# Otitis Media with Effusion in Children with Hearing Loss- A Hospital Based Retrospective Study.

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## ABSTRACT

**Background:** Otitis media with effusion is a salient disease and its clinical symptoms are not so obvious to be noticed by parents or even doctors. Therefore early diagnosis and treatment are important as hearing deprivation in children can have effect on linguistic development of child. **Methods:** This retrospective study was conducted on children with hearing loss aged between 3-15 years presenting to ENT OPD of SMGS Hospital, for a period of 1 year from. Total of 100 children were included. Detailed history and complete ENT examination was done. PTA and Impedance Audiometry was done. **Results:** The mean age was 7 years with male: female ratio of 1.8: 1. Hearing loss which was the chief complaint. Other complaints were aural fullness (38%) followed by otalgia (29%), poor attention (17%) and poor academic performance(16%). Higher prevalence in males(59%) of OME as compared to females. About 30% patients showed congested drum suggestive of acute suppurative otitis media. Other findings noted were dull drum (20%), air bubbles (6%) and air fluid level (8%) all were suggestive of otitis media with effusion.. Pure tone audiometry revealed moderate hearing loss in 59% patients of otitis media with effusion whereas it was mild in 14 patients. Impedance audiometry revealed B type graph in 85% patients. **Conclusion:** To prevent delayed diagnosis which leads to development of this disease, parents must be informed about the preventable risk factors and symptoms of otitis media with effusion.

**Keywords:** Drum, hearing loss, otitis media with effusion.

## INTRODUCTION

Otitis media with effusion is defined as serous or mucoid (non purulent) collection of fluid within the middle ear space.<sup>[1]</sup> Otitis media with effusion results from alteration of mucociliary system within the middle ear cleft where serous or mucoid fluid accumulates in association with negative pressure. The pressure change is almost invariably caused by malfunction of Eustachian tube but it does not result in rupture of tympanic membrane.<sup>[2]</sup>

This condition occurs in childhood as overt or covert hearing loss presenting as an educational or behavioural problem. Often hearing loss is first detected on routine screening examinations before or at 3.5 years of age or later at preschool testing. The type of hearing impairment or loss is referred to as conductive hearing impairment or loss and is caused by interruptions of sound vibrations to inner ear by effusion in middle ear. The hearing impairment may

range from 0-50 db of HL with an average of 20 db HL in otitis media with effusion.<sup>[3]</sup>

In most cases tympanogram shows type B graph with few exceptions.<sup>[4]</sup>

Various risk factors or predisposing factors which have been associated with development of otitis media with effusion include lower socioeconomic status, malnutrition, passive smoking, cleft palate, palatal paralysis, unresolved otitis media, viral infections of upper respiratory tract, attendance of day care centres, adenoid hypertrophy, chronic tonsillitis, chronic sinusitis, allergy/atopy, barotraumas.<sup>[5-8]</sup>

## MATERIALS AND METHODS

This retrospective study was conducted on children with hearing loss aged between 3-15 years presenting to ENT OPD of SMGS Hospital, Govt. Medical College Jammu for a period of 1 year from April 2018 to April 2019. Total of 100 children were taken in the study. Detailed history and complete ENT examination was done. PTA and Impedance Audiometry of cases was done. X Ray nasopharynx was done in all the cases to rule out adenoid hypertrophy.

**Inclusion criteria:**

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- 1) Age between 3-15 years
- 2) Complaint of hearing loss( as told by patient's attendants)
- 3) Complaint of aural fullness/earache

#### Exclusion criteria:

- 1) Age less than 3 or more than 15 years
- 2) History of otorrhea
- 3) Perforation of tympanic membrane
- 4) Congenital malformations of ear
- 5) History of intake of any ototoxic drug
- 6) Any disease of external ear

Children with conductive hearing loss were subjected to impedance audiometry to find the cause of hearing loss.

Tympanometry has also been used to find the function of Eustachian tube in cases of intact or perforated tympanic membrane. A negative or a positive pressure (-200 or +200 mm of H<sub>2</sub>O) is created in the middle ear and person is asked to swallow 5 times in 20 seconds. The ability to equilibrate the pressure indicates normal tubal function. Inference: type A tympanogram is obtained in normal patients. B type tympanogram was obtained in cases of otitis media with effusion. C type tympanogram is obtained in retracted tympanic membrane.

X ray lateral view nasopharynx is done with open mouth to look for adenoid enlargement.

## RESULTS

The present study was conducted on 100 children between the age of 3-15 years presenting with complaints of hearing loss to ENT OPD. History and otoscopic examination was done followed by detailed ENT examination of the cases with otitis media with effusion. The following observations were made:

In our study maximum patients were in the age group of 6-9 years(50%), followed by 9-12 years[Figure 1]. The mean age was 7 years. There were 65 males and 35 female patients with male: female ratio of 1.8: 1.

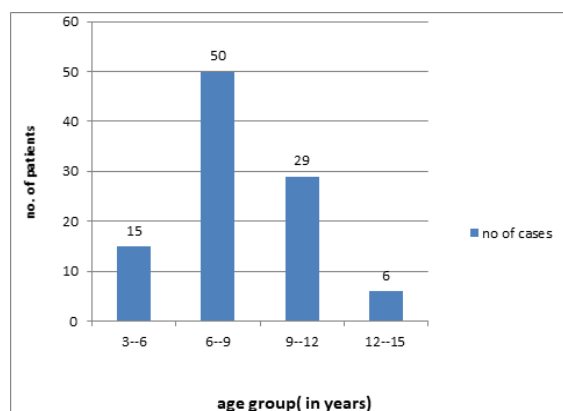


Figure 1: Age distribution of patients.

All the patients presented with hearing loss were included in the study. The other most common presenting symptom were aural fullness (38%) followed by otalgia (29%) and poor attention (17%) and poor academic performance (16%).[Figure 2]

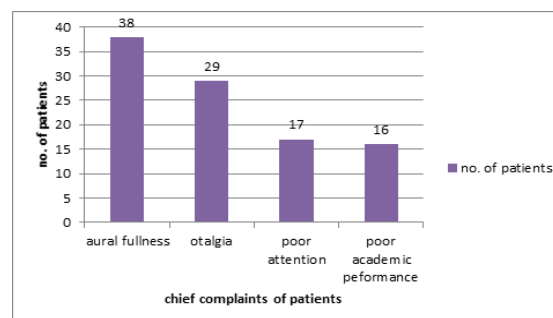


Figure 2: chief complaints of patients.

Otoscopy was performed in all the patients. About 30% patients showed congested drum suggestive of acute suppurative otitis media. Other findings noted were dull drum(20%), air bubbles(6%) and air fluid level (8%) all were suggestive of otitis media with effusion. About 18% showed normal drum on otoscopy.[Figure 3]

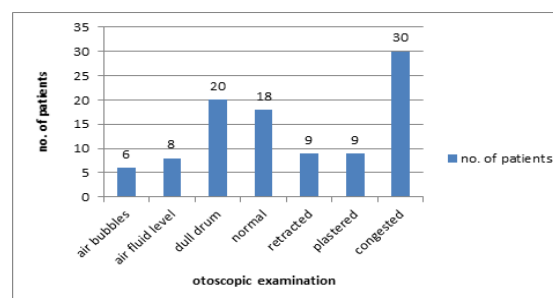


Figure 3: Otoscopic findings of the patients.

Based on above otoscopic findings and symptomatology of the patients the cause of hearing loss was found to be acute otitis media in 30% patients, otitis media with effusion in 34% patients and atelectasis in 18% patients.[Table 1]

Table 1: Cause of hearing loss.

Cause	No. Of Patients	Percentage(%)
Acute otitis media	30	30
atelectasis	18	18
Otitis media with effusion	34	34
Normal	18	18
Total	100	100

Hence out of 100 patients presenting with hearing loss 34 patients had otitis media with effusion whereas 66 patients had other causes of hearing loss as described above.[Table 2]

Table 2: Cause of hearing loss

Causes	No. Of Cases	Percentage (%)
OME	34	34
Non OME	66	66
TOTAL	100	100

Out of 34 patients who were diagnosed with otitis media with effusion maximum patients(59%) were in the age group of 6-9 years. The hearing loss was observed by their parents or by their lack of attention and poor performance at school.[Table 3] Among 34 cases of otitis media with effusion 20 were males and 14 were females with male: female ratio of 1.4:1.

**Table 3: Age distribution of patients of otitis media with effusion(n=34)**

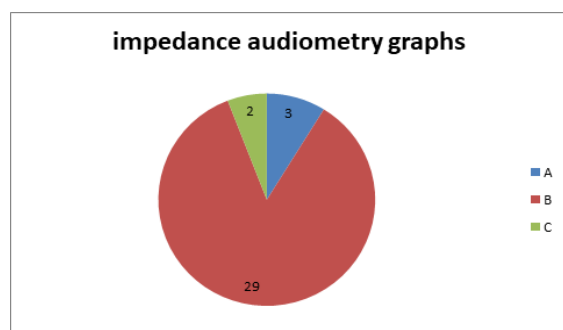
Age group(in years)	Number of cases(n=34)
3-6	4
6-9	20
9-12	6
12-15	4
total	34

Pure tone audiometry revealed moderate hearing loss in 20 out of 34 (59%)patients of otitis media with effusion whereas it was mild in 14 patients.[Table 4]

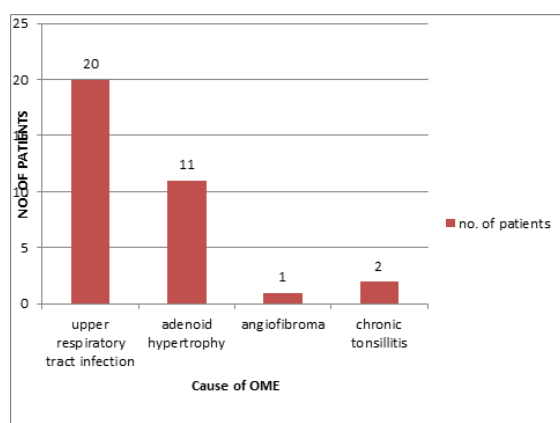
**Table 4: Degree of hearing loss in patients of otitis media with effusion.**

Degree of hearing loss	No. of patients(n=34)
Mild	14
moderate	20
total	34

Impedance audiometry revealed B type graph in 29 out of 34 patients (85%) suggestive of fluid in middle ear.[Figure 3]



**Figure 3: Impedance audiometry graphs in patients of otitis media with effusion.**



**Figure 4: Cause of otitis media with effusion.**

20 out of 34 (59%) patients of otitis media with effusion had upper respiratory tract infection prior to OME. This was followed by adenoid hypertrophy(32%) as seen on x ray nasopharynx lateral view. 1 patient of OME had Juvenile nasopharyngeal angiofibroma. He was a male of 14 years of age. 2 patients of OME had chronic tonsillitis on examination.[Figure 4]

## DISCUSSION

Otitis media with effusion is a very common disease during childhood characterised by presence of fluid in middle ear without signs of acute infection. The early detection of hearing disability in children is associated with better outcomes in communication development.

In our study we had taken 100 children presenting to ENT OPD with hearing loss which was the chief complaint. Other complaints were aural fullness (38%) followed by otalgia (29%) and poor attention (17%) and poor academic performance (16%). Our findings are consistent with the findings by Geoffrey et al (1967),<sup>[9]</sup> Baharudin et al(2007),<sup>[10]</sup> Caylan et al.(2007).<sup>[11]</sup> In all these studies hearing loss was the chief complaint of patients of OME.

In our study we observed higher prevalence in males(59%) of OME as compared to females which is consistent with the findings by Geoffrey et al (1967),<sup>[9]</sup> R Kalpna et al(1997),<sup>[12]</sup> Karan Sharma et al (2015).<sup>[13]</sup>

About 30% patients showed congested drum suggestive of acute suppurative otitis media. Other findings noted were dull drum (20%), air bubbles (6%) and air fluid level (8%) all were suggestive of otitis media with effusion. About 18% showed normal drum on otoscopy. Our findings are consistent with study by Karan Sharma et al (2015).<sup>[13]</sup>

Pure tone audiometry revealed moderate hearing loss in 20 out of 34 (59%) patients of otitis media with effusion whereas it was mild in 14 patients. Similar findings were observed by B Abdullah (2007).<sup>[10]</sup> In his study 48% showed moderate hearing loss,32% mild and 8% severe. Similarly in a study by Al Rowaily et al (2012),<sup>[14]</sup> 57.8% patients showed mild hearing loss, 40% showed moderate hearing loss and 2.2% showed profound hearing loss.

Impedance audiometry revealed B type graph in 29 out of 34 patients (85%) suggestive of fluid in middle ear. 9% showed A type curve and 6% showed B type curve. Similarly in a study by Srinam Nathan et al(2012),<sup>[15]</sup> 100% showed type B tympanogram whereas in a study by Karan Sharma et al (2015),<sup>[13]</sup> 50.175 showed type B curve and 34.5% showed type A curve whereas in a study by Arif Sanli et al(2014),<sup>[16]</sup> only 10.9% showed type B curve and 89% showed type A curve.

## CONCLUSION

One of the common causes of hearing loss in children is otitis media with effusion which if diagnosed late can lead to sequelae and complications like tympanosclerosis, retraction pockets, adhesive otitis media and hearing or speech impairment. Early diagnosis and treatment is necessary to prevent hearing loss in children.

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