

# Frequency and Etiology of Secretory Otitis Media and its Morbidity in Children

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## Abstract

**Background:** To determine the frequency of Otitis Media with effusion(OME) among children in Rawalpindi region and to find out its aetiology and the associated hearing loss.

**Method:** This descriptive study was conducted in Holy Family Hospital Rawalpindi over a period of one year (June, 7, 2007 to June, 7, 2008). Total of 563 children of 3-10 years of age presenting as out patients to ENT department during the research period were evaluated. Children with congenital anomalies of ears and impacted wax were excluded from the study. Thorough history was taken from parents of the child regarding hearing loss, tinnitus, discharge from ear, earache, itching in the ear, fever, rhinorhea, allergy, nasal obstruction, mouth breathing, recurrent sore throat, bottle feeding, language development and performance at school. Complete ENT examination was done. Hearing loss was assessed by pure tone audiometry (PTA) and OME was diagnosed with type B and C curve on tympanometry with hearing loss more than 25dB.

**Results:** Out of 563 children, 306 were male and 257 were female. OME was common in 3-7 year age group with mean 5years. 65 children were still bottle-fed. Cleft lip and palate was found in 2, mouth breathing was seen in 29, simple rhinitis was present in 197, AURTI (acute upper respiratory tract infection) in 43 and hearing loss with delayed language development in 15 patients. On otoscopic examination, tympanic membrane was dull in 27 and retracted with decreased mobility in 20. OME was diagnosed in 39 children. 33 children showed type B curve with hearing loss of 30-40dB and 6 children showed type C curve with hearing loss of 25-30dB. Common symptoms in diagnosed cases were rhinitis in 21, mouth breathing (adenoids diagnosed on x-ray) in 13, cleft lip and palate in 2, hearing loss and delayed language development in 11 and AURTI in one child. All diagnosed cases had poor performance during their school activities.

**Conclusion:** OME is a common disease in childhood and is closely related to various risk factors. It may result in serious morbidity in the form of delayed language development and poor performance at school due to hearing loss.

## Introduction

Secretory otitis media or otitis media with effusion (OME) is characterized by non purulent effusion (serous or mucoid) of middle ear. Morbidity may be in the form of hearing loss picked up by parents or teachers and delayed language development.

OME is a serious health problem concern worldwide.<sup>1</sup> Incidence of OME in 3 year old children in United States is 43% which decreases to 10-30% in 2-7 years old children and prevalence is 20%.<sup>2</sup>

OME can occur during the resolution of acute otitis media once the bacterial infection has resolved.<sup>3</sup> Eustachian tube dysfunction is nearly universal in OME, that is why it is common in children with cleft palate.<sup>4</sup> Infection, allergy, ciliary dysfunction, hyper viscosity of effusion and immunological factors also contribute to OME.<sup>5</sup> Nasopharyngeal pathology, most common adenoids are also responsible.<sup>6</sup>

Hearing loss, itching in the ears, blocked ears and infrequent mild ear pain are common symptoms but the child may be complete asymptomatic.<sup>7</sup> Otosopic findings include dull tympanic membrane, air fluid level, translucent membrane with diminished mobility and negative pressure with prominent lateral process.<sup>8</sup> Tympanometry is an effective screening test for OME with type B (flat curve) and type C curve (negative pressure <+200) with hearing loss >25dB indicate OME.<sup>9</sup> Hearing loss associated with OME may result in delayed language development.<sup>9</sup>

The purpose of the study was to find out the frequency of OME among children, the common etiological factors and to determine its consequences on hearing and language.

## Patients and Methods

In this prospective study, 563 children were evaluated. Sampling was done by simple random technique of probability sampling type.

All the children of age group 3-10 years with any ENT complaint, who presented to ENT department of Holy Family Hospital as out patients during research period were included in the study. Children with obvious deformity of external auditory canal (microtia and atresia of external auditory canal), children with impacted wax and mentally retarded children and those who refused further investigations were also excluded from study. Thorough history was taken from the parents of the child regarding hearing loss, tinnitus, discharge from ear, earache, itching in the ear, fever, rhinorrhea, allergy, nasal obstruction, mouth breathing, recurrent sore throat, bottle feeding and performance at school. Questionnaires also included delay in language development, previous history of antenatal and post natal infections, trauma, family history of deafness, systemic illness and history of any previous operation. X-Ray nasopharynx was done in patients with mouth breathing to diagnose adenoids.

Complete otorhinolaryngological examination was carried out by ENT specialists and the findings recorded. Tympanometry and PTA were carried out only in those with positive otoscopic findings. OME was diagnosed if graph obtained was type B or C with hearing loss more than 25dB. Statistical evaluation of results was done by using window SPSS10. Chi-square test was applied.

## Results

Of the 563 children included in the study, 306 were male and 257 female. OME was seen commonly in children of 3-7 years with mean 5years. 65 children were still bottle-fed. Two children had scar marks for repair of both cleft lip and palate. 29 children were mouth breathers. Simple rhinitis was present in 197 children, 15 suffered from delayed language development problem and hearing loss while 43 children had AURTI. On otoscopic examination, tympanic membrane was dull and immobile in 27 children and was retracted with prominence of lateral process and decreased mobility in 20. Tympanometry of 39 children was abnormal. 33 children showed flat curve with hearing of 30-40dB on PTA. 6 children showed type C curve with hearing loss of 25-30dB. Common symptoms in children with abnormal tympanogram were rhinitis in 21, mouth breathing in 13 (adenoids diagnosed on x-ray), cleft lip and palate in 2 hearing loss and delayed language development in 11 and AURTI in one child. Most of the children showed combination of symptoms which are shown in

table I. All diagnosed cases showed poor performance during their school activities.

**Table I: Symptoms in Children and Type of Tympanogram**

Combination of symptoms	No of children	Type of tympanogram	
		B	C
URTI and mouth breathing	1	1	
Cleft lip and mouth breathing	1	1	
Cleft lip	1	1	
Rhinitis and mouth breathing	7	7	
Rhinitis	14	11	3
Mouth breathing	4	3	1
Hearing loss	11	9	2

## Discussion

In the United States middle ear infections and OME are the most common medical problems in infants and children of pre school age.<sup>2</sup>In our study OME was found in 39 (6.92%) out of 563 children. It was more commonly seen between 3-5 years with mean 4 years. Our study is comparable with previous studies which showed 15-40% point prevalence in OME between infancy and 5 years<sup>10</sup> and prevalence of OME 9.0% in pre school children.<sup>1</sup> Further in that study children in a child care centre were examined at frequent intervals and found to have OME at some time during examination period with peak incidence during winter months.

Our study showed slight male predominance but as in previous literature, no significant statistical difference was found. Slight higher male frequency was also shown in some other studies.<sup>10</sup>

In the old studies AURTI, Eustachian tube dysfunction, mucociliary abnormality, cleft palate, adenoids, acute otitis media and environmental agents had been the common etiological factors in children<sup>6</sup> but in adults nasopharyngeal mass was also important.<sup>11</sup> Adenoid hypertrophy was usually seen in those children with prolonged and recurrent OME.<sup>12</sup> Our study also showed the same aetiology with predominance of adenoids and environmental factors such as allergic rhinitis.

In previous studies main diagnostic otoscopic findings were dull tympanic membrane with decreased mobility, air fluid level, translucent with chalky patches and retracted drum with prominent lateral process of malleus.<sup>13</sup> In our study most common otoscopic finding was dull tympanic membrane and prominent lateral process with decreased mobility of membrane.

Tympanograph with type B and C curve had been the diagnostic criteria for OME in previous studies.<sup>14</sup> In our study same criteria were kept; type B curve was seen in most of the children.

OME is the leading cause of hearing loss in children. Hearing loss is usually mild to moderate. One of the studies conducted to evaluate the morbidity associated with OME, showed average air conduction 27.5 dB<sup>15</sup> and also showed sensory neural hearing loss (SNHL) in some children.<sup>(6,11)</sup> In our study mild to moderate conductive loss was detected with average loss of 30 dB but not a single case presented with SNHL. Morbidity in the form of hearing loss and poor performance at school was seen in all children with OME.

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