

Incidence and Impact of Undiagnosed Otitis Media with Effusion in Children

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Received: 25-03-2024 / Revised: 23-04-2024 / Accepted: 16-05-2024

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Conflict of interest: Nil

Abstract:

Background: Otitis media with effusion leads to hearing loss which may significantly compromise the cognitive, linguistic and emotional development of children. It usually goes undiagnosed because the children do not have any complaints and the next of kin do not notice any symptoms such as hearing loss.

Methods: 411 children of the age group 5-8 years from various camps conducted in sub-urban areas of Darbhanga Bihar, were subjected to complete ear, nose throat examination, Study duration is Sixteen Months. 27 children were excluded on the basis of exclusion criteria and 384 children were then considered for the study. Hearing assessment was done by tuning fork test & those who had a hearing loss were then subjected to pure tone audiogram and tympanometry at our center. An interview was done with the parents of these children to acquire information about the academic and social behavior of these children with the help of a questionnaire.

Results: 89 (21.30%) children were suffering from otitis media with effusion and 26 (6.77%) children had Eustachian tube blockage which is a precursor to otitis media with effusion. Almost all of these children were poor in social and academic performance.

Conclusion: The high incidence of undiagnosed otitis media with effusion warrants an awareness program for parents and teachers and also if possible, a regular screening program for children.

Keywords: otitis media with effusion, serous otitis media, conductive hearing loss.

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Introduction

Hearing is an important factor in the cognitive, linguistic, emotional development and academic performance of children. A decreased hearing can hamper their quality of life. Otitis media with effusion is one of the commonest causes of mild conductive deafness in school going children, which goes untreated in initial stage of disease because the patient rarely complains of decreased hearing.[1]

The parents are usually unaware of the progress of the disease but teachers may notice the symptoms as the child remains inattentive in class. Indication of hearing loss such as, lack of attention in a group setting, poor social interaction, disengagement from class activities that require good "signal in noise" hearing; should be noticed and a consultation should be done with an otology specialist. Some studies have been done on prevalence of otitis media with effusion at different places. The prevalence rate of secretory otitis media in the study done by Yadav et al, in 2006 was 20.75%.[2] In another study done by Lous and Silvia was 20.75%.[3] Tos reported higher

prevalence of 30% however, he studied children in the age group of 2-4 years.[4] Harker reported prevalence of 41.3% in Alaskan children, this high incidence was due to the extremely cold climatic conditions.[5] Ogisi reported a prevalence of 8% only.[6] Muzaffer Kırıs et al in their study found that the prevalence of otitis media with effusion was 10.43%.[7]

These variations in prevalence rates are due to different climatic conditions and socioeconomic status of children. A mild hearing loss may be sufficient to impair speech and language acquisition in young children and may lead to educational retardation and poor academic performance.[8] We have done a prospective screening with an aim to check the prevalence of undiagnosed otitis media with effusion in school going children in the age group of 5-8 years as this is the age when the social and academic development of the children takes place.

Materials and Methods

In present study, 411 children in the age group of 5-8 years were screened. Study site and settings: Various camps were organized in the suburban areas of Darbhanga Bihar Areas. Most of these children were from low socio-economic background and lived in over-crowded societies. A complete and thorough ear nose throat examination was done along with tuning fork test in all the children. Those who had negative results on Rinne’s test were then referred to our center where they were subjected to pure tone audiogram and tympanometry. An interview was conducted with the parents of these children in which they were asked if they ever noticed their child having any difficulty in hearing and also about the social and academic performance of the child with the help of a questionnaire.

Inclusion Criteria

Children of age group 5 -8 years.

Exclusion Criteria

Children having perforation in tympanic membrane, those under treatment for an ear disorder or those suffering from any systemic ailment were excluded from this study.

Results

27 children were excluded from the study on the basis of exclusion criteria, and study was conducted on 384 children. Out of these, on otoscopy 71 (19%) children had retracted tympanic membrane, 23 (6%) children had lusterless (gray color) tympanic membrane and 21 (5%) children had fluid behind the eardrum. Rest of the 269 (70%) children had normal tympanic membrane. (Fig.1)

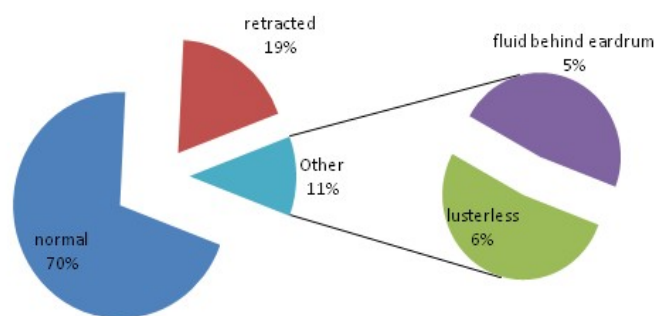


Figure 1:

Tuning fork test was done in all the subjects. Rinne’s test gave negative results with 512Hz tuning fork in 27 children, indicating moderate conductive hearing loss. While 88 children gave negative results with 256Hz tuning fork indicating mild conductive hearing loss. Rest 269 children had positive results.(Fig. 2)

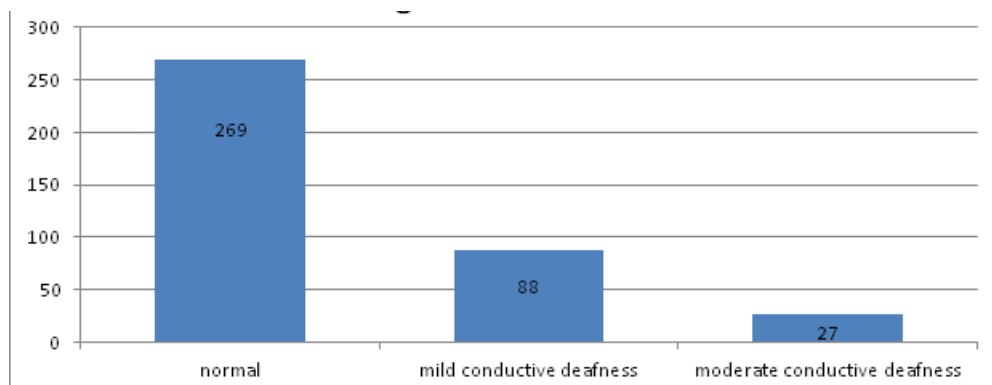


Figure 2:

These findings were then confirmed with a pure tone audiogram & were found correct.

These 115 children who had hearing loss were then subjected to a tympanometry, which showed type B graph in 89 (23.10%) children, and type C graph in 26(6.77%) children.

Type B graph indicates that the child is suffering

from Otitis Media with Effusion.

Type C graph indicated eustachian tube blockage, which is a precursor to otitis media with effusion, hence these children were considered to be at risk and provided with requisite treatment. An interview with parents & teachers of these 89 students was conducted. They were given a questionnaire in regard to the scholastic achievements and behavior of these

children. 84 of these 89 children had poor academic performance in school, 87 children were inattentive in class, 79 had poor social interaction, 63 were usually disengaged from class activities, and 81 spoke loud.

Discussion

The incidence of undiagnosed otitis media with effusion in our study was 23.10% (89 of 384), which is quite high. 26 (6.77%) children had Eustachian tube blockage, these children are also at risk of developing otitis media with effusion. When the epithelium of the Eustachian tube is inflamed, it becomes edematous and causes ciliary dysfunction, this leads to blockage of Eustachian tube. Though a viral upper respiratory tract infection is probably the most common cause of damage to the Eustachian tube epithelium, there are other potential reasons. It may be secondary to an allergic reaction or may be secondary to chronic nasopharyngeal infection in the adenoidal tissue or gastro-esophageal reflux. Eustachian tube blockage is a precursor to otitis media with effusion.

The parental suspicion of hearing loss is inadequate for the identification of mild hearing loss as caused by otitis media with effusion.[9] This was also seen in our study none of the parents were aware about the hearing difficulty of their child. Though a direct evidence or complaint of hearing loss was not reported by any subject but most of them had indirect evidence in form of being inattentive in social environment such as classrooms. It's not unusual to have fluid behind normal tympanic membrane.[10] Otoscopy by itself cannot diagnose every case of otitis media with effusion therefore an audiological assessment should be done even if the tympanic membrane is normal. The prevalence of OME decreases with increasing age. There is a high social impact of OME, and its prevalence is directly correlated to young age, atopy, snoring, previous history of acute otitis media and of recurrent URTIs second-hand smoking, low socioeconomic status, living in a crowded house, lack of breast-feeding and attending day care centers. Moreover, the climatic and environmental factors also play an important role in the occurrence of OME.[7, 11- 17]

These factors were also seen in our study and with this data we can tag these children who are living in overcrowded places and belonging to the low socioeconomic group as high risk cases. Children who are susceptible to otitis media with effusion tend to have more separate episodes of effusion rather than an increased overall duration of episodes. Such children are primarily distinguished by the likelihood with which they acquire the disease than by their ability to recover from it.[18] In a child without symptoms, the tympanic membrane appears opaque, thickened and scarred; it is difficult to distinguish between acute otitis media and otitis media with effusion.[19] A change in the appearance of tympanic membrane

should be considered seriously and further investigations should be done. Takata et al found that pneumatic otoscopy can do as well as or better than tympanometry and acoustic reflectometry.[20] For the typical clinician, pneumatic otoscopy should be easier to use than other diagnostic methods. Erkkola-Anttinen N et al did a study and found that parents can very conveniently use spectral gradient acoustic reflectometry and get an expert otologist opinion if the levels are high.[21] Awareness programs for teachers and guardians can effectively prevent these vulnerable children from developing hearing impairment.[22]

Conclusion

As otitis media with effusion affects the development and academic life of the children in the most crucial age of life and in view of its high incidence rate, we suggest that a screening program is required for the children of age group of 5-8 years in the schools or at least there can be an awareness program for teachers about the presenting symptoms of this disease because they can easily identify such children and recommend them for an expert opinion and further management by an Otorhinolaryngologist.

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