

Causes of Conductive Hearing Loss in School Going Children

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ABSTRACT

Objective: Timely identification of conductive hearing loss in school going children to prevent unnecessary morbidity.

Study Design: Prospective study

Place and Duration of study: This study was conducted at the ENT Department of Abbasi Shaheed Hospital, Karachi from January 2014 to June 2016.

Materials and Methods: In this study those cases were selected that came with conductive hearing loss. Both sexes were included in this study and age ranges were from 4 years to 15 years of age. After informed consent, detailed history and examination was done and relevant investigations were also conducted.

Results: In this study female were affected more i.e. 101 (57.38%). The highest incidence of age was between 10-12 years 75 (42.61%) followed by 7-9 years of age 45 (25.56%). Poor socio-economical status was more affected 128 children (72.72). The most common cause of conductive hearing was wax 85 (46.59%) followed by middle ear effusion 43 (24.43%).

Conclusion: Most of the causes of conductive hearing loss are treatable. Early identification of conductive hearing loss may prevent the un-necessary morbidity.

Key Words: hearing loss, decrease hearing, deafness

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INTRODUCTION

Childhood hearing loss is a serious consequence for families and children. About 11.3% people have hearing impairment and deafness¹. According to the WHO report that 250 million people with hearing disability in this world². In under developed countries about 10 infants born with hearing problem in every 1000 birth. Hearing problem among young children in third world countries have been accepted as a major problem^{3,4}. Hearing is the important sense of organ and plays a important role in the development of speech and language. 3 to 5 years is the important period for speech and language development. Early detection of hearing problem and early intervention help in language development and cost effectiveness⁵.

Hearing loss can be divided into conductive, sensori-neural or mixed types. In conductive type of hearing loss, interference of mechanical transmission of sound from external ear to inner ear and this is the most common type of hearing loss in children⁶.

Senori-neural hearing loss is due to failure to transducer vibration to nerve impulses in cochlea. In mixed type both type of hearing loss shows combination of sensory and conductive loss. Conductive type of hearing loss is due to problem in external ear or middle ear. Common causes of conductive hearing loss due to external ear problems are Ear wax, Otitis externa, exostosis, congenital stenosis or atresia, perforated tympanic membrane⁷ or barotrauma⁸ while in middle ear causes include acute or serous otitis media, cholesteatoma, temporal bone trauma or congenital malformation of ossicles. Otitis media with effusion is the commonest cause of conductive hearing loss in children⁹. It is due to blockage of Eustachian tube which leads to reduce pressure in the middle ear and accumulation of fluid in the middle ear which decreased the movement of ossicles and tympanic membrane. The main reason of Eustachian tube dysfunction is repeated upper respiratory tract infection, improper treatment of acute otitis media, allergic rhinitis, adenoids and infected tonsils. Eustachian tube dysfunction can be treated by medically and treat the cause like adenoidectomy or tonsillectomy. Ear wax is another common cause of conductive hearing loss. It is a yellowish waxy substance which is secreted in external auditory canal. It protects the ear from foreign particles, microorganism and dust. Normally, it washes away but sometime it accumulated in external auditory canal and becomes hard and causes conductive hearing loss. Before removal of hard wax, it should softened and then suction and clearance done. Otomycosis is a fungal ear

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infection. It causes inflammation, masses of debris, suppurative and conductive hearing loss if occluded external auditory canal¹⁰. It is caused by *Aspergillus niger*, *Aspergillus fumigatus* and *Candida albicans*^{11,12}. Treatment is simple topical antifungal¹¹ and suction and clearance.

Most of the conductive type of hearing loss is treatable. Conductive hearing loss child is more disruptive in the class as compare to other student. Most of the conductive type of hearing loss is the treatable. Early diagnosis and intervention may be beneficial for improving hearing in children.

MATERIALS AND METHODS

This study was conducted in Otorhinolaryngology department of Abbasi Shaheed Hospital. This hospital is the tertiary care hospital and cover large low socio-economical population. This study was conducted from January 2014 to June 2016. After taking detail history and complete examination 176 patients were selected for this study. Necessary investigation like Pure tone audiogram and impedance were advice. X-ray and C-T scan were done where needed.

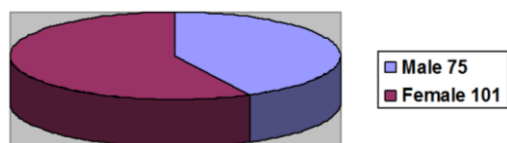
Inclusion criteria: Patients came with conductive hearing loss between 4 to 15 years of age included in this study.

Exclusion criteria:

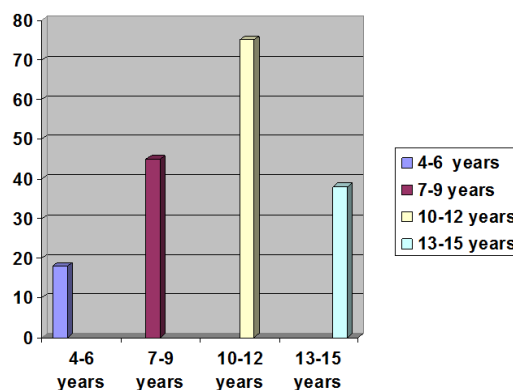
- I) Previous ear surgery
- II) Sensorineural hearing loss
- III) Above 15 years of age
- IV) Below 4 years of age
- V) Not come for follow up.

RESULTS

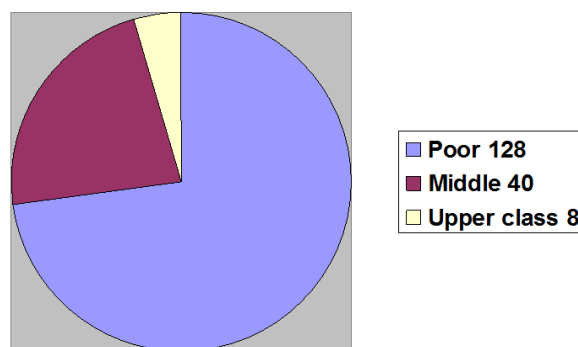
176 Patients were selected in this study in which female were more as compared to male which was 101 (57.38%) children were female while male were 75 (42.61%) shown in pie chart 01. The highest incidence were noted between the age of 10-12 years of age which was 75 patients (42.61%) followed by 7-9 years of age 45 (25.56%). 128 (72.72%) patients were belonged from poor socio-economical status while only 8 patients (4.54 %) were belonged to good socio-economical status shown in pie chart 2. The most common cause was wax 85 (46.59%) shown in table. Second most common cause was middle ear effusion 43 (24.43%) followed by tympanic membrane perforation 32 (18.18%).



Pie Chart No.1:



Bar Chart No.1:



Pie Chart No.2:

Table No.1: Causes

Causes	No. of patients
Wax	84 (47.72%)
Middle ear effusion	42 (23.86%)
Tympanic membrane perforation	31 (17.61%)
Otomycosis	18 (10.22%)
Canal atresia	1 (0.56%)

DISCUSSION

In school going children conducting hearing loss is one of the common presentations brought to clinics. It varies from wax impaction, otomycosis, tympanic membrane perforation or middle ear effusion. Conductive hearing loss limit the ability of child to develop hearing and speech capabilities. Most of the causes are treatable. But this common problem usually ignores by general practitioner which effects in educational performance of the child.

In this study try to find out the common causes of conductive hearing loss in children. The highest incidence was noted between the age of 10-12 years of age 75 children followed by 7-9 years. The prevalence of conductive hearing loss is high in poor socio-

economical status as compare to middle or upper class. Chadha S.K et al. performed comparative study between slum and non-slum areas and he noted that ear infection is much common in slum area¹³. Another study which also showed in rural areas the prevalence of conductive hearing loss is 9.44% as compared to urban area which was 1.3%¹⁴. 72.72% children were belonged to poor socio-economical status area. Wax is the most common cause of conductive hearing loss in children which is 46.59%. Hearing impairment due to cerumen impaction is the significantly cause of hearing loss in all age groups^{15,16}. According to Sugiura S. et al that routine ear examination and removal of wax if present significantly improved hearing and memory disorder¹⁷. The second common cause of conductive hearing loss in children is middle ear effusion i.e. 24.43%. According to Terray Oliver Penn that most of the children have experienced of otitis media with effusion in early childhood¹⁸. The prevalence in younger was high i.e. 31.4% which decreased in older children¹⁹. Arif Sanli et al. study showed that prevalence of otitis media with effusion is 12.2% in primary school children¹. The reason is that eustachian tube changes from horizontal to vertical direction and al immunity is also increased. This diagnosis is made on clinical examination and audiometry and

Tympanometry assessment. By using simple measure like oral or local steroids, antibiotics, decongestant, auto inflation and surgical procedure like adenoidectomy^{20,21}.

Tympanic membrane perforation is also a major factors which causes conductive hearing loss. It may be due to acute otitis media, traumatic perforation, chronic suppurative otitis media. One in four children suffer at least single episode of acute otitis media²². The prevalence of acute otitis media in younger age group is high as compare to older children.

In tropical countries otomycosis in external ear is one of the common presentations. It causes itching, ear blockage and ear ache. 18% Patient presents with fungal infection. One review study shows incidence of otomycosis is 51.3%, this incidence is increased in summer season²³. In current study, incidence of Otomycosis was noted in 10.22%. Symptoms of Otomycosis itching, discharge from ear, pain and decreased hearing. Treatment is usually topical antifungal and suction and clearance. Hearing loss is the common problem in children which is either unnoticeable or not treated probably. Most of the causes of conductive hearing loss are treatable. Early identification the cause of conductive hearing loss and early treatment will be beneficial for the children and family.

CONCLUSION

Author concluded that most of the causes of conductive hearing loss are treatable. Early detection of hearing loss will decrease the morbidity and parents depression.

Author's Contribution:

Concept & Design of Study: Aqeel-ur-Rehman Hameed
 Drafting: Asif Abbasi
 Data Analysis: Asif Abbasi
 Revisiting Critically: Faheem Ahmed Khan
 Final Approval of version: Aqeel-ur-Rehman Hameed

Conflict of Interest: The study has no conflict of interest to declare by any author.

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