Original Article

Hearing Loss in Children

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 deafness[1]. According to the WHO report that 250 million people with hearing disability in this world[2]. 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 effectiveness[5].

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 children[6].

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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 membrane[7] or barotrauma[8] 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 children[9]. 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

infection. It causes inflammation, masses of debris, suppuration and conductive hearing loss if occluded external auditory canal[10]. It is caused by Aspergillus niger, Aspergillus fumigatus and Candida albicans[11,12]. Treatment is simple topical antifungal[11] 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 impedence were advice. X/ray and C-T scan were done where needed.

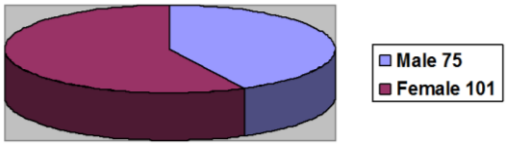
Inclusion criteria: Patients came with conductive hearing loss between 4 to 15 years of age included in this study.

Exclusion criteria:

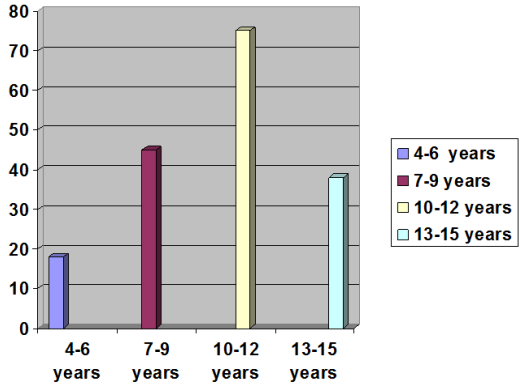
I) Previous ear surgery
II) Sensorineural hearing loss
III) Above 15 years of age
IV) Below 4 years of age
V) Not come for follow up.

RESULTS

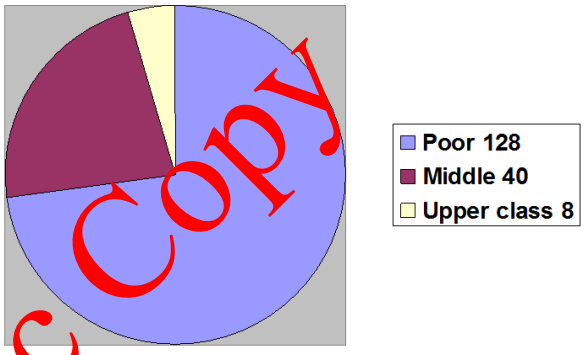
176 Patients were selected in this study in which female were more as compared to male which was 101 (57.38%) children were female while male were 75 (42.61%) shown in pie chart 01. The highest incidence were noted between the age of 10-12 years of age which was 75 patients (42.61%) followed by 7-9 years 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 era 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 etal. performed comparative study between slum and non-slum areas and he noted that ear infection is much common in slum area[13]. 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 disorder[17]. 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 childhood[18]. The prevalence in younger was high i.e. 31.4% which decreased in older children[19]. Arif Sanli etal. study showed that prevalence of otitis media with effusion is 12.2% in primary school children[1]. The reason is that eusctachian 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 iniflation 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 supparative otitis media. One in four children suffer at least single episode of acute otitis media[22]. 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. 10% Patient presents with fungal infection. One review study shows incidence of otomycosis is 51.3%, this incidence is increased in summer season[23]. 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.

REFERENCES

1. Bess FH, Dodd-Murphy J, Parker R. Children with minimal sensori-neural hearing loss- prevalence, educational performance and functional status. Ear and Hearing 1998;19:339-54.
2. Ozturk O, Silan F, Oghan F, et al. Evaluation of deaf children in a large series in Turkey. Int. J. Pediatr Otorhinolaryngol 2005; 69: 367-73.
3. Rao Rs, Subramanyam MA, Nair NS, Rajashekar B. Hearing impairment and ear diseases among children of school entry age in rural south India. Int J of Pediatr Otorhinolaryngol 2002;64105-10.
4. Olusanya BO, Okolo AA, Ijaduola GT. The hearing profile of Nigerian school children. Int J Pediatr Otorhinolaryngol 2002;64:55:73-9.
5. Grasso DL, Hatzopulos S, Cossu, et al. Role of the "roomingin" on efficacy of universal neonatal hearing screening programmes. Acta Otorhino-laryngol Ital 2008;28:243–246.
6. Paludetti G, Conti G, Nardo W, Corso ESE, Rolesi R, Picciotti PM, Fetoni AR. Acta Otorhinolaryngol Ital 2012;32(6): 347–370.
7. Hearing Loss. Health Central. Retrieved 8 June 2013.
8. Rex S. Haberman. Middle Ear and Mastoid Surgery. Thieme Medical 2004;152.
9. Ruben, Robert J. Hearing Loss and Deafness. The Merck Manual 2007. Retrieved 8 June 2013.
10. Kaur R, Mittal N, Kakkar M, Aggarwal AK, Mathur MD. Otomycosis: a clinicomycologic study. Ear Nose throat 2000;79 (8):606-9.
11. Manguia R, Daniel ST. Ototopical auntifungals and Otomycosis: a review. Int J Pediatr Otorhinolaryngol 2008;74(4):453-9.
12. Vennewald I, Klemme. Otomycosis: Diagnosis and treatment. Clin Dermatol 2010;28 (2):202-11.
13. Chadha SK, et al. Comparative prevalence of otitis media in children living in urban slums, non-slum urban and rural areas of Delhi. Int J Pediatr Otorhinolaryngol 2014;78(12): 2271-4.

14. Minja BM, Machemba A. Prevalence of otitis media, hearing impairment and cerumen impactation among school children in rural and urban Dar es salam, Tanzania. Int J Paediatr Otorhinolaryngol 1996; 1(37):29-34.
15. Tarafder KH, et al. Disabling hearing impairment in the Bangladeshi population. J Laryngol Otol 2015;129(2):126-35.
16. Adobment PRI, Ogisi FO. Hearing loss due to wax impaction. Nig Q J Hosp Med 2012;22(2):117-20.
17. Sugira S, et al. Effect of cerumen impaction on hearing and cognitive functions in Japanese older adults with cognitive impairment. Geriatr Genrontol Int 2014;14 Suppl 2:56-61.
18. Penn TO, Grantham DO, Gravel JS. Simulated Conductive Hearing Loss in Children. J Am Acad Audiol 2004;15:300–310 .
19. Biagio L, et. al. Paediatric otitis media at primary healthcare clinic in South Africa. S Afr Med J. 2014;104(6):431-5.
20. Cunningham M, Guardiani E, Kim HJ, et al. Otitis media. Future Microbiol 2012;7:733–753.
21. Williamson I. Otitis media with effusion in children. Clin Evid 2007;1 (Online).
22. Saki N, et al. Quality of life in children with recurrent acute otitis media in southwestern of Iran. Indian J Otolaryngol Head Neck Surg 2014;66 (Suppl 1): 267-70.
23. Gharaghani M, et al. Otomycosis in Iran: A review. Mycopathol 2015.