MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.11.149.152

OPEN ACCESS

Key Words
Otorhinolaryngology, Pediatric deafness, etiology, tympanic membrane, ear canal

Corresponding Author
Shveta Dhadwal,
7 Air Force Hospital, Kanpur, India
(cheeku1984@gmail.com)

Author Designation
[1]Graded Specialist
[2]Assistant Professor

Received: 20 August 2024
Accepted: 13 September 2024
Published: 16 October 2024

Citation: Shveta Dhadwal and Sandhya Kumari, 2024. Understanding the Etiology of Deafness Among Pediatric Patients: A Cross Sectional Study in a Tertiary Care Hospital of North India. Res. J. Med. Sci., 18: 149-152, doi: 10.36478/makrjms.2024.11.149.152

Understanding the Etiology of Deafness Among Pediatric Patients: A Cross Sectional Study in a Tertiary Care Hospital of North India

[1]Shveta Dhadwal and [2]Sandhya Kumari
[1]7 Air Force Hospital, Kanpur, India
[2]Department of Dermatology, IGMC, Shimla, India

ABSTRACT
Normal hearing is essential for development of appropriate academic and psycho social skills in children. Many causes of hearing loss are preventable and curable. Otitis media is the commonest cause of persistent mild to moderate hearing impairment in children and young adults in developing countries. Respiratory tract symptoms such as cough, sore throat and earache are also frequent in children. The present study was aimed at identifying the cause of deafness in the pediatric age group. The present cross-sectional descriptive study was conducted among children attending Outdoor patient Department of ENT Department of Govt. Medical College, Amritsar. The child was subjected to audiological assessment depending upon his/her ability to participate in such an assessment. Incidence of hearing loss were found to be maximum in age group of 5-8 years. Males were found to be affected more than females. The most common cause was perforation in the tympanic membrane, followed by discharge in external ear canal, retraction of tympanic membrane and bulging of tympanic membrane.

INTRODUCTION

Normal hearing is essential for development of appropriate academic and psycho social skills in children. Many causes of hearing loss are preventable and curable[1]. According to World Health Organization 42 million people (age >3 years) have hearing loss. The major cause for hearing loss is otitis media, which is second only to common cold as a cause of infection in childhood. Otitis media is also the commonest cause of persistent mild to moderate hearing impairment in children and young adults in developing countries. Respiratory tract symptoms such as cough, sore throat, and earache are also frequent in children. Upper respiratory tract infections predispose a child to complications such as otitis media, tonsillitis and sinusitis. Tonsillitis most often occurs in children, a condition rarely appreciated in those younger than 2 years. Based on a multi centric Indian Council of Medical Research study, of the 67.4 million persons with deafness in India, 1.4 million are children less than 14 years[2]. Fortunately 90-95% of these suffer from conductive impairment of hearing which is due to impaired treatment. The rest i.e., 5-10% have sensorineural loss for which no medical or surgical treatment is available. These are the cases that require early diagnosis and rehabilitative measures[3]. It is, therefore, imperative that hearing loss be identified early and rehabilitative measures taken at the earliest. This would increase the number of children who can be integrated into the mainstream and put less burden on the society in spite of the handicap. In children with acquired hearing loss, early identification and intervention is important to facilitate speech and language development to continue as normally is possible and prevention further deterioration. Thus, in the present study, we intended to identify the etiology of deafness in children.

MATERIALS AND METHODS

The present cross-sectional descriptive study was conducted among children attending Outdoor patient Department of ENT Department of Govt. Medical College, Amritsar. The study comprised of 200 children of either sex in the age group of 2-12 years presenting with symptoms suggestive of unilateral or bilateral hearing impairment. After obtaining an informed consent from the parents, a detailed history was taken in each case followed by detailed examination and investigation was obtained from the accompanying person with special focus on following on the antenatal history, any sickness of the newborn child in immediate post-partum period and treatment there of, developmental history of child with focus on developmental milestones and special emphasis on milestones of hearing and other relevant history. The child was subjected to general physical and complete ear nose and throat examination. Particular attention was paid to any congenial malformations of ear, nose and throat and other congenital head and neck disorders. The child was subjected to audiological assessment depending upon his/her ability to participate in such an assessment. It included Tuning Fork Tests (Rinne's Weber and Absolute Bone Conduction using a Tuning Fork with 512 Hz frequency), Free Field audiometry and Pure Tone Audiometry and wherever required the children was also subjected to OtoAcoustic Emissions Test, Impedence Audiometry and/or Brain Stem Evoked Audiometry.

Statistical Analysis: The data was entered and cleaned using MS Excel spreadsheet. The data was further analysed using SPSS version 22. The data was tested for normalcy using skewness, kurtosis as well as Kolmogorov Smirnov test was applied. The qualitative variables were expressed as frequencies and proportions whereas the quantitative variables were expressed in mean and standard deviation.

RESULTS AND DISCUSSIONS

The mean age of the children was 8.7 (SD=2.4) years. Incidence of decreased hearing loss due to ear pathology was found to be maximum in the age group of 5-8 years. Out of 200 patients 123 were boys and 77 were girls. Male to female ratio was 1.58:1. 35.5% patients were from urban area and 64.5% patients from rural area. (Table 1).

Table 1: Socio-Demographic Profile of Children (n=200)

Variables	Frequency (n)	Proportion (%)
Age in months		
24-48	62	31
49-96	71	35
97-144	67	33
Gender		
Male	123	61.5
Female	77	38.5
Socioeconomic status		
Urban	71	35.5
Rural	129	64.5

42.5% patients had bilateral involvement and57.5% had unilateral involvement. Out of the children having unilateral involvement, 29.5% patients had right ear involvement and 28.5% patients had left ear involvement. The most common symptoms were pain in ear in 30%,aural fullness 28%,URTI in 58.5%and 31.25% had presented with on and off discharge from ear. The commonest finding during examination was found to be perforation in tympanic membrane with

simultaneous presence of ear discharge in 125 patients (31.2%). (Table 2).

Table 2: Clinical Features of the Children (n=200)

Variables	Frequency (n)	Proportion (%)
Ear involvement		
Right	59	29.5
Left	54	28.5
Bilateral	85	42.5
Total		
Clinical features		
Pain	60	30
Aural fullness	56	28
Urti	117	58.5
Sign		
Wax	64	16
Discharge	125	31.25
Retraction	97	24.25
Bulging	50	12.5
Perforation (dry)	45	11.25
Perforation (Wet)	125	31.25

Prevalence of confirmed permanent childhood hearing impairment increases until the age of 9 years to a level higher than previously estimated. Relative to current yields of universal neonatal hearing screening in the United Kingdom, which are close to 1/1000 live births, 50-90% more children are diagnosed with permanent childhood hearing impairment by the age of 9 years. Pediatric audiology services must have the capacity to achieve early identification and confirmation of these additional cases. The age of the patients included in this study was 2-12 years. Maximum number of the patients were found in the age group 5-8 years. Another study proved that hearing loss is common in 5-8 years old children and common cause of hearing loss in this age group is inflammatory disease of the middle ear, which is easily preventable and curable. Specific attention is essential in this group[1]. With the exception of age and season, the relative risks of environmental factors for OME are always very low[4]. The reason for more number of patients in this age group is that early exposure of young infants to a large bacterial inoculum (or frequent exposures to immunologically distinct pathogens) provides constant stimulation of the inflammatory cascade, which damages mucosal tissue yet fails to eradicate pathogens. This begins a vicious cycle that may persist throughout childhood: early exposure, persistent bacterial colonisation and chronic mucosal disease[5]. In the present study of 200 patients 77(38.5%) patients were female and 123(61.5%) were male. Male to female ratio was 1.5:1.The presentation of male patients slightly outnumbered the females. This could be due to greater immunity of girl child or increase attention of parents to male child. Nevertheless, as patients have been randomly selected this difference could be only pertaining to random case selection. In a study done in Nepal among 1632 children, ENT diseases were found to be more common among male children (60%)[2]. The male to female ratio was 1.5:1 and similar findings were found in our study too. In the present study out of 200 children, bilateral ear involvement was found in 85(42.5%) patients, left ear was involved in 54(2%) patients and right ear was involved in 59 (29.5%) patients. In another study done in Egypt on hearing loss, bilateral hearing loss was present in 75.98% of those with hearing loss and unilateral hearing loss[6]. It shows that in each age group the frequency of bilateral hearing loss was significantly higher than unilateral hearing loss.1 Hearing loss tends to be a bilateral condition: a fact that increases the burden of the problem. In another study, among the unilateral cases attacks, the right ear was affected slightly more than left side[7]. Out of 200 patients 75 (31.25%) had ear discharge, 60 (30%) had pain, 56 (28%) had aural fullness and 117 (58.5%) had upper respiratory tract infection. In another study about decreased hearing in children, patients had earache in 47% patients ,55% patients had fever, cough and symptoms of upper respiratory infection. Michael and Larry in their study reported that patients presented with hearing loss (100%) had ear discharge (90%), pain (10%)[8]. Gulati *et al.* in their study reported that main symptom with hearing loss was ear discharge[9]. Out of 200 patients 106 (53%) had wax in their ear canal, discharge was found in ear canal during examinations in 86 (43%) patients, retraction in tympanic membrane was found in 47 (23.5%) patients, bulge in the tympanic membrane was found in the 100 (50%) patients and perforation was found in 94 (47%) patients. Cerumen impaction was found in 20.45% of the rural school children and in 14.8% of the urban school children in a study done in Tanzania[10]. In the similar study done in Nepal most common otologic disorder was ear wax (40.9%)[2]. In another study children with conductive hearing loss tympanic membrane (TM) perforation with or without otorrhea was found out to be 27.74%[1].

CONCLUSION

Incidence of hearing loss were found to be maximum in age group of 5-8 years. Males were found to be affected more than females. Most of the patients were of low socioeconomic status and belonged to rural area. 42.5% patients had bilateral ear involvement. Amongst patients with unilateral involvement, 27% had involvement of left ear and 29.5% had right sided pathology. The most common associated symptoms were URTI followed by episodic discharge from either or both ears and pain. The most common finding seen during examinations was perforation in the tympanic membrane, followed by discharge in external ear canal, retraction of tympanic membrane and bulging of tympanic membrane. 31.25% of the patients had

discharge in the external auditory canal with simultaneous perforation in the tympanic membrane.

REFERENCES

1. Soheilipour, S., F. Sohelipour, Z. Danesh and H. Danesh., 2012. Evaluation of type and risk factors of hearing loss in 5-15 years old children in Isfahan. RJMS 19: 37-44.
2. Nepali, R., B. Sigdel, 2012. Prevalence of ENT diseases in children: Hospital based study. Int. J. Otorhinolaryngol., Vol. 14 .10.5580/2bd9.
3. Yasawardene, A., 2003. Management of deaf child. Sri Lanka J. Ch. Hea., 32: 71-74.
4. Zielhuis, G.A., E.W. Heuvelmans-Heinen, G.H. Rach and P.V.D. Broek, 1989. Environmental Risk Factors for Otitis Media with Effusion in Preschool Children. Scand. J. Primary Health Care, 7: 33-38.
5. Shah, S.,V. Bhat,D. Gupta and V. Sinha., 2006. A study of correlation of site and size of perforation with deafness. Indian J Otology 12: 47-49.
6. Hamid, O.A., O.M.N. Khatib, A. Aly, M. Morad and S. Kamel, 2007. Prevalence and patterns of hearing impairment in Egypt: A national household survey. East. Mediterr. Health J., 13: 1170-1180.
7. Stankovic, M.D., 2008. Audiologic Results of Surgery for Cholesteatoma. Otology and Neurotology, 29: 933-949.
8. Michael, C.O. and B. Laryy., 2003. Tympanic membrane perforation in otitis media. Asian J Otolaryngology 1: 32-34.
9. Gulati, S.P.,O.P. Sachdeva and P. Kumar., 2002. Audiological profile in CSOM. Ind J of Otology., 8: 24-28.
10. Minja, B.M. and A. Machemba, 1996. Prevalence of otitis media, hearing impairment and cerumen impaction among school children in rural and urban Dar es Salaam, Tanzania. Int. J. Pediatr. Otorhinolaryngol., 37: 29-34.