

Assessment of Hearing Loss by Audiometry - Our Experience at Tertiary Care Hospital

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Abstract

Objective: To analyze the results of pure tone audiometry in the terms of age, sex, and type of hearing loss attending the hospital with the complaint of hearing loss.

Materials and Methods:

In this descriptive study, patients attending Benazir Bhutto hospital with complaints of hearing loss were included. The data analysis was done under the terms of age, sex and unilateral/bilateral, and type of loss after pure tone audiometry of every case. The type of hearing loss was determined as conductive, SNHL, and mixed hearing loss.

Results: There were 47 patients. Males were 34 (72.34%) outnumbering 13 females 13(27.66). Adults were 44 (93.61%) and children were 3(6.34%). Mixed hearing loss was 28 (59.57%) compared to conductive hearing loss 15 (31.91) and SNHL 4 (8.51%).

Conclusion: Hearing loss is more common in adults and more prevalent in males. It is mostly bilateral. Mixed hearing loss is more common as compared to conductive and SNHL respectively. Sociacusis is to be taken seriously.

Keywords: Hearing loss, Conductive, SNHL, Mixed, Unilateral, Bilateral.

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1. Introduction

Hearing loss is one of the most important problems in human life¹. No age is immune to hearing loss. It can affect children as well as adults.¹ Sensorineural hearing loss due to aging, presbycusis, is the most common type of hearing loss in adults.² It has got profound bad impacts on the daily life of an individual in the form of problems in education, learning, job, earning, and daily social life.

In children, it may lead to mal-development of language or even deaf-mutism. The child may have problems with learning, playing with other children, and other social interactions. In adults, it can affect communication, education, game, job, and social life. Difficulty in communication with others can cause job problems and social isolation. These economic and social problems lead to depression and other psychological ailments.³

The hearing loss can be congenital and acquired. The congenital problems usually affect children but adults can also be involved in later parts of their life. Congenital hearing loss is one of the most common chronic conditions in children.⁴ The congenital problems can be conductive, SNHL, or mixed

hearing loss. Conductive problems are less prevalent compared to SNHL and mixed hearing loss. SNHL is the most common pediatric problem and needs to be detected in early childhood by the parents or in consultation with the Otolaryngologist. Earlier it is detected better it is for the betterment of the patient as so many remedies are available these days like cochlear implants if afforded/funded.

In adults like children hearing loss can be due to so many reasons like hereditary / acquired. Hereditary problems appear late in adults compared to children. The acquired problems are more prevalent than the hereditary. A long list of causes of Hearing loss in adults is available from very innocent to sinister ones. The most important ones include infections, trauma, drugs, and noise exposure.

A new phenomenon of hearing loss called "socioacusis" has developed due to the use of social instruments, headphones, and hand-free mobile devices. Young adults especially nowadays constantly expose themselves to loud music. Many of these may be individuals may be aware that exposure to loud music can result in a hearing loss but most do not appreciate⁵. As like causes so many remedies for

hearing loss are also available in modern otology in the form of medicines, surgery, and implants.

2. Materials & Methods

Patients attending the ENT Department of Benazir Bhutto hospital Rawalpindi with complaints of hearing loss were included in this study. Patients were examined in the clinic and those requiring audiometry were given an appointment. Pure tone audiometry was done in the audiometry section of the department. Results were recorded and analyzed regarding age, gender, and type of hearing loss.

3. Results

Table 1:

| | |
|------------------------------------|---------------------------|
| Total patients | 47 |
| Male | 34(72.34%) |
| Female | 13(27.66%) |
| Adults | Total 44(93.61%) |
| | Male 33(75%) |
| | Female 11(25%) |
| Children | Total 3(6.78) |
| | Male 1(33.33%) |
| | Female 2(66.67%) |
| Conductive Hearing Loss | Total 15(31.91) |
| | Male 12(80%) |
| | Female 3(20%) |
| | Adults 15(100%) |
| | Children 0(0%) |
| Sensory Neural Hearing Loss | Total 4(8.51%) |
| | Male 3(75%) |
| | Female 1(25%) |
| | Adults 4(100%) |
| | Children 0(0%) |
| Mixed hearing loss | Total 28(59.57%) |
| | Male 23(82.14) |
| | Female 5(17.86%) |
| | Adults 25(89.28%) |
| | Children 3(10.72%) |
| Bilateral | Total 43(91.48%) |
| | Adults 40(93.02%) |
| | Children 3(6.98%) |
| | Male 31(72.09%) |
| | Female 12(27.91%) |

| | |
|-------------------|-----------------------|
| Unilateral | Total 3(6.38%) |
| | Adults 3(100%) |
| | Children 0(0%) |
| | Male 3(100%) |
| | Female 0(0%) |
| Normal | Total 1(2.12%) |
| | Adults 1(100%) |
| | Children 0(0%) |
| | Male 1(100%) |
| | Female 0(0%) |

There were 47 patients in total. The males were 34 (62%) compared to the females 13 (38%). As far as age group was concerned they were predominantly Adults 44 (93%) and children were 3 (7%) only. One patient with a complaint of hearing loss was found to be normal. Conductive hearing loss cases were 15, SNHL cases were 4 and mixed hearing loss were 28 cases.

The majority of the cases were bilateral 43 (91.48%) with unilateral 3 (6.38%) only. In one case hearing was normal.

As per the type of hearing loss; the mixed hearing loss was most common in (59.9%) of the cases. Among them, (82.14%) were males compared to females (17.86%). Mixed hearing loss was more common in adults (89.28%) compared to children (10.72%).

Conductive hearing loss was 2nd most common hearing loss (31.91%) of all the cases. Among them, 80% were males and 20% were females. All the patients belonged to the adult group as there was no patient in the Pediatric age group.

SNHL was the third most common 8.51% of the total. 75% were males and 25% were females. All were adults. No children were found in this category.

4. Discussion

Hearing loss can affect any age group from newborns to adults age. It can cause deleterious effects on speech and language development in children and social and vocational problems for adults to earn their livelihood. Hearing loss can develop due to problems anywhere in the auditory system from the external auditory meatus to the hearing center. It can be conductive, SNHL, or mixed hearing loss. Irrespective of the cause and site of the lesion rehabilitation process can help the individual. It is very important to determine the cause of hearing loss because many treatable etiologies can be determined through history,

clinical examination, and investigations. It is very easy to label any hearing loss, especially SNHL as idiopathic but every hearing loss has got an etiology and requires proper work out to unveil the etiology

In children, it may lead to mal-development of language or even deaf-mutism. The child may have problems with learning, playing with other children, and other social interactions. All over the world and especially in underdeveloped countries there is a lot of delay in seeking proper healthcare leading to the mismanagement of the cases. The age of diagnosis of hearing problems in different areas is different. Late diagnosis is not due to financing, family situation, or lack of facility but rather the concern of the people given to the hearing problem.⁶ As an otolaryngologist, the present author saw so many cases even in educated people being delayed because of ignorance and negligence. On many occasions, it was very hard for the parents to believe that their child has got hearing loss not compatible with normal life. The hearing loss can be detected earlier even at home by close observation of the child responding to various sounds and activities. This can be easily done by health education to the mothers and masses by the healthcare personnel and social workers.

In adults, it can affect communication, education, game, job, and social life. Difficulty in communication with others can cause job problems and social isolation. These economic and social problems lead to depression and other psychological ailments. These adults can be assisted by their families and healthcare and social organizations by the provision of healthcare, social, and economic assistance. Many organizations provide hearing aids and cochlear implant facilities to the needy.

The cases of hearing loss in children may be congenital and acquired. The congenital causes are more common in children as compared to adults. The congenital cases may surface in the latter part of life but they are rare in adults. The congenital hearing loss in children may be familial or isolated. The acquired cases in children range from conductive, SNHL, and mixed. The conductive hearing loss cases predominate in children and most are due to infections especially CSOM and Secretory otitis media. SNHL and Mixed hearing loss are less common. In Mixed cases, CSOM with prolonged use of ear drops leads to the problem of Mixed hearing loss. It is required to detect hearing loss earlier in children as so many remedies like medicines,

surgery, hearing aids and cochlear implants are available as remedy these days

In adults like children hearing loss can be due to so many reasons like hereditary/acquired. Hereditary problems appear late in adults compared to children. The only congenital problem appearing in adults is Hereditary Familial Progressive SNHL which appears in the families in adult life as bilateral SNHL^{7,8} while the patients behave as normal in childhood. The acquired problems are more prevalent than the hereditary. A long list of causes of Hearing loss in adults is available from very innocent to sinister ones. The most important ones include infections, trauma, drugs, and noise exposure. Many drugs are known to cause ototoxicity with mild to severe inner ear damage. The most common drugs to cause ototoxicities are aminoglycosides and platinum derivatives like cisplatin established in various studies.^{9,10,11} Adults due to active life are more prone to hearing loss due to trauma e.g. accidental, homicidal, indulgence in fights and occupational noise as denters, carpenters, and telephone operators. Industrial noise is a cause of the severity of hearing loss in workers of every country.¹² A national awareness program should be established for the awareness and compensation of industrial workers and other noisy occupations.

In this study mixed hearing loss was found to be more common compared to the conductive and SNHL respectively. Mixed hearing loss entails both conductive and sensorineural hearing loss elements. In studies^{13,14} mixed hearing loss was more common than conductive and SNHL, complementing our findings. But in other studies,¹⁵ conductive hearing loss was found to be the most common but mixed loss was the least common. In another study by Liaquat Ali¹⁶, SNHL was found to be the most common followed by mixed loss and conductive loss. The differences among these studies can be attributed to age, exposure to trauma, noise, use of ototoxic drugs, and geographical attributes.

A new phenomenon of hearing loss called "socioculus" has developed in the recent past due to the use of social instruments, headphones, and hand-free mobile devices, especially by young adults. It is a different phenomenon from SNHL due to exposure to industrial noise and presbycusis where the relatively elder generation is affected. In Sociacusus, the younger generation exclusively uses headphones, hands-free, and listening to noisy music suffers from it. The present

author has seen at least a dozen cases of sociacusis in young adults ranging from 17-30 years with abuse of the above-said instruments. There are so many young adults falling victim to the recreational noise using personal leisure instruments, as professional musicians, or attending nightclubs or other recreational activities in an atmosphere of damaging sound levels.¹⁷⁻²¹ These problems can be controlled by health education to the individuals, musicians, and club managers to take protective measures and avoid using damaging sound levels and making legislation.

5. Conclusion

Hearing loss is more common in adults and more prevalent in males. It is mostly bilateral and as a type of hearing loss, it is more common as mixed hearing loss and less common as conductive and SNHL. The new phenomenon of “sociacusis” needs to be taken seriously by the concerned.

CONFLICTS OF INTEREST- None

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Contributions:

M.K.Y, U.A- Conception of study

J.F.M- Experimentation/Study conduction

S.A - Analysis/Interpretation/Discussion

U.A- Manuscript Writing

M.A- Critical Review

A.H.A- Facilitation and Material analysis

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