Original Research Article

An audiometric study of hearing type and degree of hearing impairment at tertiary health care centre

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Abstract

Background: Hearing loss is the second leading disability and top most cause for the sensory deficit in the world. Hearing loss can impair the communication skills of the affected person. The individual thus suffers both physically and socially. We can reduce the incidence by preventing it to occur or by early detection of problem. **Aim and Objective:** 1) To study the type and degree of hearing loss in patients. 2) To study the age and gender-wise differences with respect to type and degree of hearing loss. **Methodology:** 200 patients attending outpatient department of otorhinolaryngology Department of Otorhinolaryngology, Apollo institute of medical sciences and Research, Chittoor were studied. Data collection included demographic characters (age, sex), clinical history and various tests like pure tone audiometry, impedence audiometry. Data analysed using appropriate statistical tests**. Results and Discussion:** Most of the patients (22.5%) belonged to age group of 51-60 years followed by 21-30 years (20.5%). Mean age of the patient was 49.6± 3.6 years. Sensorineural deafness was the most (65%) common type followed by Mixed deafness (16%). Males (65%) were most commonly affected than females (35%). Type of hearing loss in different age group and sex were significantly different ($p<0.05$).

Key Words: Hearing loss.

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INTRODUCTION

According to Who fact sheets march 2018, Over 5% of the world's population – or 466 million people – has disabling hearing loss (432 million adults and 34 million children). It is estimated that by 2050 over 900 million people – or one in every ten people – will have disabling hearing loss. Hearing loss is difficult to identify. Hence, it is often neglected or late identified and rehabilitated.[1] Hearing loss may result from genetic causes, complications at birth, certain infectious diseases, chronic ear infections, the use of ototoxic drugs, exposure to excessive loud noise, and ageing. 60% of childhood hearing loss is due to preventable causes. Different types of hearing loss are as follows. Sensorineural Hearing Loss occurs when the hearing organ, the Cochlea, and/or the auditory nerve is damaged or malfunctions so it is unable to accurately send the electrical information to the brain. Sensorineural Hearing Loss is almost always permanent. Conductive Hearing Loss occurs when there is a problem with the Outer or Middle Ear which interferes with the passing sound to the Inner Ear. It can be caused by such things as too much Earwax, Ear Infections, a perforated tympanic membrane, a fluid in middle ear, or inherited disorder like abnormal bone growth in the Middle Ear such as Otosclerosis. It is more common in females and indigenous population. A Mixed Hearing Loss occurs

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when both Conductive Hearing Loss and Sensorineural Hearing Loss are present. The sensorineural component is permanent, while the conductive component can either be permanent or temporary. For example, a Mixed Hearing Loss can occur when a person with Presbycusis also has an Ear Infection.This study was carried out to find the different types of hearing loss in patients and the differences in them according to age and sex.

MATERIAL AND METHODS

Study was carried out in 200 randomly selected patients attending outpatient Department of Otorhinolaryngology, Apollo institute of medical sciences and Research, Chittoor The criteria of patient selection was hearing loss for 1 month duration or more, in one or both ears, to exclude the psychogenic and malingerer. The study was approved by ethical committee, Apollo institute of medical sciences and Research, Chittoor Patient's written valid informed consent for the study and operative procedures was taken. The data collection includes demographic characters like age, sex, detailed history and clinical examination of patients. Pure tone audiometry was performed in all cases above five years of age. Impedance Audiometry and Speech Discrimination was performed in selected cases. Brain Stem Auditory Evoked Potential (B.E.R.A) was conducted in profound deaf and in patients below five years who do not understand and execute Pure Tone Audiometery (P.T.A). Patients who complained of hearing impairment and did not have any positive clinical or audiological sign were excluded from the study. The types of hearing impairment were categorized as sensorineural hearing loss (SNHL), conductive, mixed, mixed + SNHL, and others (conductive loss in one ear and mixed or SNHL in the other).The degree of hearing impairment was graded as mild (25-40 dB threshold), moderate (41-55 dB threshold), moderately severe (56-70 dB threshold), severe (71-90 threshold), and profound (>90 dB threshold). Data was analysed using appropriate statistical tests.

RESULTS

Most of the patients (22.5%) belonged to age group of 51-60 years followed by 21-30 years (20.5%). Only 2% of patients were from age group below 10 years. (table1) Mean age of the patient was 49.6± 3.6 years. Sensorineural deafness was the most common type with 130(65%) patients out of 200. Mixed deafness was observed in 32 patients who contributed 16% of total deafness. Conductive deafness was observed in 13.5% of patients. (table2) Table 3 shows distribution of patients according to type of deafness and sex of patient. Hearing loss showed male predominance (65%). When we compared gender-wise distribution of various types of hearing impairment it was observed that SNHL, mixed and conductive types of hearing impairment affected more males, i.e., 68.46%, 68.75% and 51.85%, respectively, compared to females. This difference was statistically significant (P <0.05) Table 4 shows distribution of patients according to age and type of deafness. Sensorineural deafness was observed most commonly (25.38%) in age group of 51-60 years. Mixed deafness was observed most commonly (31.25%) in 21-30 year age group. Conductive deafness was observed (48.15%) in 21-30 year age group. This difference in hearing loss with age group was statistically significant. Bilateral hearing loss accounted for 90%of total cases compared to 10% of unilateral cases. In our study population, sensorineural type and moderate degree (32.14%) of hearing loss were found to have higher prevalence compared to other types and degrees of hearing losses irrespective of age and gender. Mild (21.49%) and moderate (17.43%) were the second and third highly observed severity of hearing loss.

Table 1: Distribution of patients according to age

Sr no	Age group	No of patients	Percentage
1	0-10	4	2
2	11-20	15	7.5
3	21-30	41	20.5
4	31-40	22	11
5	41-50	29	14.5
6	51-60	45	22.5
7	61-70	25	12.5
8	71-80	12	6
9	81-90	7	3.5

Table 2: Distribution of patients according to type of deafness

Sr no	Type of deafness	No of patients	percentage
1	SNHL	130	65
2	Mixed	32	16
3	Conductive	27	13.5
4	Mixed + SNHL	5	2.5
5	Others	6	3

Table 3: Distribution of patients according to type of deafness and sex of patient

Sr no	Type of deafness	Male	Female	Total
1	SNHL	89(68.46%)	41(31.54%)	130(100%)
2	Mixed	22(68.75%)	10(31.25%)	32(100%)
3	Conductive	14(51.85%)	13(48.15%)	27(100%)
4	Mixed + SNHL	2(40%)	3(60%)	5(100%)
5	Others	3(50%)	3(50%)	6(100%)
	Total	**130(65%)**	**70(35%)**	**200(100%)**

Table 4: Distribution of patients according to age and type of deafness

Type of deafness	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Total
SNHL	2	10	17	14	18	33	20	10	6	**130**
Mixed	0	1	10	2	7	6	4	1	1	**32**
Conductive	1	3	13	6	2	2	0	0	0	**27**
Mixed + SNHL	1	0	0	0	1	2	0	1	0	**5**
Others	0	1	1	0	1	2	1	0	0	**6**
Total	**4**	**15**	**41**	**22**	**29**	**45**	**25**	**12**	**7**	**200**

DISCUSSION

In our study, Most of the patients (22.5%) belonged to age group of 51-60 years followed by 21-30 years (20.5%). Different studies have shown that the prevalence of hearing loss increased with age among all demographic groups.[2] The 51-60 age group peak could be due to age-related pathophysiologic changes in the cochlea. Occupational noise may be the reason for high incidence among younger age group (21-30 years) similar results were seen in previous studies[3,4,5] Sensorineural deafness was the most common type with 130 (65%) patients out of 200. Mixed deafness was observed in 16% of total deafness. Conductive deafness was observed in 13.5% of patients. As most of the patients belong to older age group sensorineural deafness is more common. Old age is having risk factors like hypertension, diabetes contributing higher incidence. Similar findings were seen in other studies[5,6,7,8]. Hearing loss showed male predominance (65%) in our study. This difference of type of hearing loss and sex was statistically significant (P <0.05). similar findings were seen in Hong *et al*.[9] Agrawal *et al*.[2] observed that men generally had higher prevalence of bilateral, unilateral, and high-frequency hearing loss across the age range compared with women. These findings are supported by factors like more noise exposure, more prevalence of hypertension and diabetes mellitus in males. Bilateral hearing loss accounted for 90% of total cases compared to 10% of unilateral cases. Similar findings were observed in previous studies [10-14]. This difference is because unilateral hearing loss is mostly go unnoticed. In our study population, sensorineural type and moderate severe degree (32.14%) of hearing loss were found to have higher prevalence compared to other types and degrees of hearing losses. Mild (21.49%) and moderate (17.43%) were the second and third highly observed severity of hearing loss.

CONCLUSION

Hearing loss is more common in older age group and young adults so audiometric screening is necessary in apparently healthy people to detect mild hearing loss.

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