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AL105027Assessment of Hearing Status in Elderly Patients in a Rural Tertiary Care Hospital

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Abstract:
Objectives: To assess the hearing status in elderly patients in a rural tertiary care hospital
Materials and Methods: 55 patients over the age of 59 years with hearing loss as the chief complaint attending out patient department of ENT department of Burdwan Medical College & Hospital, Burdwan over a period of 1 year (January, 2018 to December, 2018) were selected for this study for hearing assessment.
Results: Out of 55 patients. (i.e. 110 ears), 33 (60%) were males and 22 (40%) were females with male-to-female ratio 1.5:1. Mean age of patients were 72.81 ±10.21. Pure tone audiometry showed moderate hearing loss is more common. The most prevalent audiometric configurations were gradual sloping (59.09%). The patients had symptoms associated with hearing loss were tinnitus (16 patients, 29.09%), blockage (7 patients, 12.72%), vertigo (6 patients, 10.08%) and vague sensation (1 patient, 1.81%).
Conclusion: Majority of elderly persons suffer from age related hearing loss which imposes a negative impact on the quality of life of those persons. It is a major public health problem.
Key words: Hearing loss; Elderly patients; Pure Tone Audiometry

I. INTRODUCTION

Hearing loss is the third most prevalent chronic condition among older people behind arthritis and hypertension, and there is a slight tendency for the prevalence to be higher in men than in women [1,2]. Hearing impairment in elderly population is very common age related problem which has got a significant impact on quality of life as it can lead to depression, dependence, isolation and it is also associated with balance problems and frequent falls in elderly people. Numerous epidemiological studies indicate that threshold of hearing and the prevalence of hearing disability increase markedly with age (3, 4).

II. MATERIALS AND METHODS

55 patients over the age of 59 years with hearing loss as the chief complaint attending out patient department of ENT of Burdwan Medical College & Hospital, Burdwan over a period of 1 year (January, 2018 to December, 2018) were selected for this study. Written informed consent was taken from all patients after proper explanation of study. Proper history taking and meticulous clinical and ontological examination was carried out. History of the following diseases was excluded from all the patients participating in this study: genetic deafness, congenital deafness, drug-induced hearing loss, sudden deafness, noise-induced hearing loss, infections and systemic disease-related hearing loss.

The study was done in 55 patients (33 males and 22 females) over the age of 59 years with hearing loss as the chief complaint. The age ranged from 60 to 93 years. The subjects were divided into four groups: Group-A 60 to 69 years (n=25), Group- B 70 to 79 years (n=15), Group-C 80 to 89 years (n=9) and Group-D ≥ 90 years (n=6). All participants underwent pure tone audiometry testing with a Labat Audiolab software based audiometer in sound proof booth with ambient noise level in compliance with National Standard Acoustics.

Audiometric test methods — Basic pure tone audiometry was conducted. Both air and bone conduction thresholds were tested on each patient, using calibrated TDH 39 earphones and B-71 bone vibrator respectively. For each patient, the claimed better ear was tested first and then the other ear. Air conduction threshold was measured first using Hughson-Westlake procedure and then bone conduction. The frequencies testing sequences was 1 kHz, 2 kHz, 4 kHz, 8 kHz, 500 Hz and 250 Hz in air conduction, and 250Hz, 500 Hz, 1 kHz, 2 kHz and 4 kHz in bone conduction. The mid frequencies were tested whenever required. The hearing loss severity of each ear was rated according to the classification criteria by JG Clark as normal hearing, mild hearing loss, moderate hearing loss, moderately severe hearing loss, severe hearing loss and profound hearing loss (Table 1). The

audiometric configuration of all tested ears was characterized as flat, gradually sloping, sharply sloping, precipitously sloping, trough/saucer, rising and notch.

III. OBSERVATION

There were 55 patients. (i.e. 110 ears). Among them, 33 (60%) were males and 22 (40%) were females with male-to-female ratio 1.5:1. Mean age of patients were 72.81 ±10.21. 50 (45.45%) patients belonged to the age group of 60-69 years with a mean age of 64.08 ± 3.02 (SD) years. 15 patients (27.28%) belonged to age group of 70-79 years with a mean age of 71.13± 2.06 (SD), 9 patients (16.37 %) belonged to age group of 80-89 years with a mean age of 84.77± 3.29 (SD), 6 patients (10.90%) belonged to age group of 90 years and above with mean age of 91.5 ± 1.2 (SD) in the study.

Pure tone audiometry showed normal Pure tone average in 16 ears (14.54%), 26 to 40 dB loss of hearing in 13 ears (11.82%), 41 to 55 dB loss in 26 ears (23.64%) and 56 to 70 dB loss in 23 ears (20.91%), 71 to 90 dB loss of hearing in 26 ears (23.64%) and above 90 dB loss in 6 ears (5.45%)

The most prevalent audiometric configurations were gradual sloping (59.09%) followed by flat pattern (18.18%), sharply sloping (5.46%), precipitously sloping (9.09%), corner audiogram (2.72%), raising (1.82%), trough/ saucer(1.82%), and notch (1.82%). [**Table-2]**.

21 patients (38.18%) complained only hearing loss. The patients had symptoms associated with hearing loss were tinnitus (16 patients, 29.09%), blockage (7 patients, 12.72%), vertigo (6 patients, 10.08%) and vague sensation (1 patient, 1.81%). 4 patients (7.27%) complained no problem in their ears.

IV. DISCUSSION

Otological disease and hearing loss associated with aging is common among older people (5). The male to female ratio found in this study is 1.5:1.0. There are a number of patho-physiological processes underlying age related changes to functional components in the inner ear (5). The term presbyacusis which means age related hearing loss was first coined by ZWAARDENMAKER (6).

India census 2011 showed that there are about 103.9 million elderly people in India, 8.6% of the total population. According to the report of United Nations Population Fund and Help Age India, the elderly population will increase to more than 173 million around the year of 2026.

In this paper, elderly subjects of different ages were investigated. It can be seen from Table 2 & 3 that hearing loss in elder adults generally shows a gradual deterioration especially in high frequencies, Hearing loss was mild in the low frequency area, but moderate to severe in high frequency area. High frequencies sloping hearing loss were more prominent compare to other audiometric pattern in elderly population. Moderate to Moderately severe degree of hearing loss were predominant. Thresholds remain stable from 60-63 years of age, except a significant deterioration along with age at 8 kHz frequency. At 80 to 90 years and above age groups, most threshold changes are at only 500 Hz and 1 kHz but not at high frequencies, indicating stable high frequency hearing sensitivity in patients over 80 years of age.

V. CONCLUSION

Majority of elderly persons suffer from age related hearing loss which imposes a negative impact on the quality of life of those persons. It is a major public health problem and care should be taken to improve the problems by pro per rehabilitation with the fitting of hearing aids when necessary.

VI. CHARTS AND TABLES

Chart – 1

Age distribution

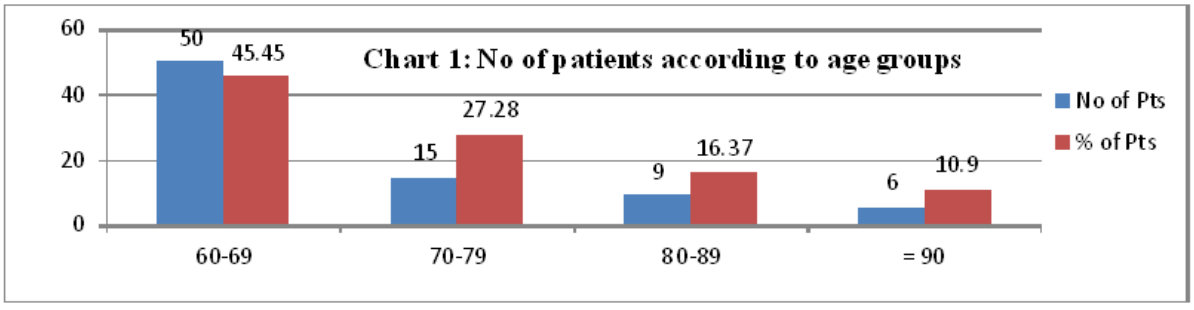

Chart – 2
Types of hearing loss

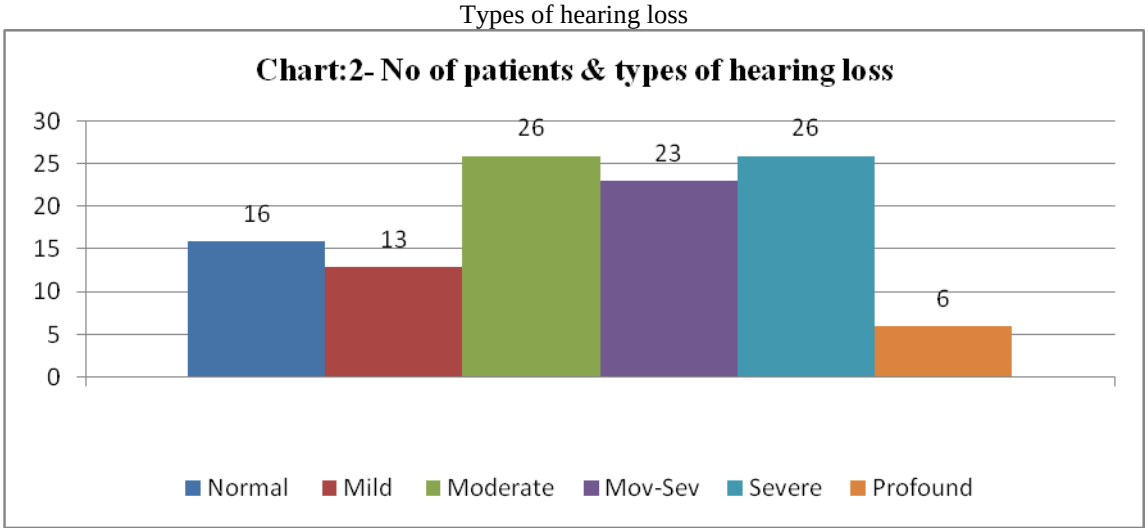

Table – 1
Classification of degree of hearing loss

Degree of hearing loss	**Hearing threshold (dB HL)**
Normal hearing	–10 to 25
Mild	26 to 40
Moderate	41to 55
Moderately severe	56 to 70
Severe	71to 90
Profound	≥ 91

Table –2
Audiogram pattern

SN	**Audiometric pattern**	**No of Patients in %**
1	Flat pattern	18.18
2	Gradual sloping	59.09
3	Sharply sloping	5.46
4	Precipitously sloping	09.09
5	Raising	1.82
6	Trough/saucer	1.82
7	Notch	1.82
8	Corner	2.72

Table – 3
Relation between audiogram patterns with different age groups.

Audiogram pattern	No of ears				
	60 -69 (A)	70-79 (B)	80-89(C)	≥ 90(D)	Subtotal
Flat pattern	15 (75%)	4 (20%)	1 (5%)	0 (0%)	20
Gradual sloping	26 (40%)	19 (29.23%)	12 (18.46%)	8 (12.31%)	65
Sharply sloping	1 (16.66)	3 (50%)	0 (0%)	2 (33.34%)	6
Precipitously sloping	3 (30%)	2 (20%)	5 (50%)	0 (0%)	10
Raising	0 (0%)	2 (100%)	0 (0%)	0 (0%)	2
Trough/saucer	2(100%)	0 (0%)	0 (0%)	0 (0%)	2

Notch	2(100%)	0 (0%)	0 (0%)	0 (0%)	2
Corner	1 (33.33%)	0 (0%)	0 (0%)	2 (66.67%)	3
Total	50	30	18	12	110

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