A Clinico Epidemiological Study of Elderly Patients (≥60 Years) Suffering from Presbycusis Visiting Tertiary Centre at Gorakhpur District

Authors
Mamta Kusum¹, Arun Srivastava², Arushi Sumpriya³, D K Srivastava⁴
¹Junior Resident, Deptt. of Community Medicine, BRD Medical College, Gorakhpur, UP, India
²Associate Professor, Deptt of Community Medicine, BRD Medical College, Gorakhpur, UP, India
³Professor, Deptt of Community Medicine, BRD Medical College, Gorakhpur, UP, India
⁴Assistant Professor, Deptt. of Community Medicine BRD Medical College, Gorakhpur, UP, India

Abstract
Objective: To study clinico-social correlates of presbycusis in elderly patients of age ≥60 years.
Study Design: A cross-sectional study
Study Setting: ENT Department of B.R.D. Medical College, Gorakhpur
Study Period: October 2017 - February 2018
Result: Out of 138 patients examined for age related hearing loss 60.14% were male and 39.86% were female which shows male predominance. Most of the elderly patients belonged to 60 – 69 years of age group (49.28%), of urban area (62.32%), Hindu (65.94%), unemployed (89.13%). Majority were married (72.46%) and belonged to lower socioeconomic class (42.03%). Majority of males (83.13%) and females (67.27%) having hearing loss suffered from hypertension (83.13%). 19.27% males and 36.36% females suffering from hearing loss also suffered from diabetes mellitus. 27.27% elderly females having hearing loss had tinnitus and 45.45% had vertigo as associated symptom while only 12.05% elderly males having hearing loss were suffered from tinnitus and 27.71% males suffered from vertigo.

Keywords: Presbycusis, Elderly, vertigo, tinnitus.

Introduction
Presbycusis or age related hearing loss is the most common type of sensorineural hearing loss caused by the natural aging of the auditory system. It occurs gradually and initially affects the ability to hear higher pitched (higher frequency) sounds. Over time, it can result in individuals being unable to clearly hear sounds at progressively lower frequencies. People with presbycusis often notice that speech is loud enough, but not clear – as if the talker is mumbling.

As per WHO estimates in India there are approx 63 million people who are suffering from significant auditory impairment, this places the estimated prevalence at 6.3% in Indian population. The National Sample Survey 58th round (2002) surveyed disability in Indian household and found that hearing disability was the second most common cause of disability. In urban area loss was 9% of all disabilities and in rural area it was 10%. Hearing disability is an important issue in geriatric medicine because it is associated with numerous
health issues, including accelerated cognitive decline, depression, increased risk of dementia, poorer balance, falls, hospitalizations, and early mortality. There are also social implications, such as reduced communication function, social isolation, loss of autonomy, impaired driving ability, and financial decline. This study was an attempt to know the socio-demographic and related clinical factors among elderly patients suffering from age related hearing loss.

Material and Methods
An interview based cross sectional study was done on 138 elderly patients (≥60 years) who came to ENT department of B.R.D. Medical College from October 2017 to February 2018. Prevalence is taken as 9% (based on earlier study done by Varshney Saurabh et al.1). A total of 153 elderly patients came for consultation for hearing loss out of which 15 refused to give consent. Therefore a total of 138 patients were enrolled for study of socio-demographic profile and clinical history.

Material and Methods
An interview based cross sectional study was done on 138 elderly patients (≥60 years) who came to ENT department of B.R.D. Medical College from October 2017 to February 2018. Prevalence is taken as 9% (based on earlier study done by Varshney Saurabh et al.1). A total of 153 elderly patients came for consultation for hearing loss out of which 15 refused to give consent. Therefore a total of 138 patients were enrolled for study of socio-demographic profile and clinical history.

Results
Table 1 Description of studied elderly patients according to socodemographic profile (N=138)

| Groups                  | Subgroups | Total (N=138) | Male (n=83) | Female (n=55) | Test of significance |
|-------------------------|-----------|---------------|-------------|---------------|----------------------|
| Age in years            | 60 - 69   | 68(49.3%)     | 33(39.76%)  | 35(63.64%)    | x²=13.75, p<0.05, df=2 |
|                         | 70-79     | 42(30.4%)     | 25(30.12%)  | 17(30.9%)     | x²=.209, p>0.05, df=1 |
|                         | >80       | 28(20.3%)     | 25(30.12%)  | 3(5.45%)      | x²=1.005, p>0.05, df=1 |
| Area of residence       | Rural     | 52(37.7%)     | 30(36.14%)  | 22(40%)       |                     |
|                         | Urban     | 86(62.3%)     | 53(63.86%)  | 33(60%)       |                     |
| Religion                | Hindu     | 91(65.9%)     | 52(62.6%)   | 39(70.9%)     |                     |
|                         | Muslim    | 47(34.1%)     | 31(37.3%)   | 16(29.09%)    |                     |
| Marital status          | Married   | 100(72.5%)    | 69(83.1%)   | 31(56.36%)    | x²=12.61, p<0.05, df=2 |
|                         | Unmarried | 8(5.8%)       | 4(4.82%)    | 4(7.27%)      |                     |
|                         | Widow     | 30(21.7%)     | 10(12.05%)  | 20(36.36%)    |                     |
| Educational qualification| Illiterate| 31(22.5%)    | 20(24.1%)   | 11(20%)       | x²=3.91, p>0.05, df=3 |
|                         | Primary   | 39(28.3%)     | 26(31.33%)  | 13(23.6%)     |                     |
|                         | Middle    | 31(22.5%)     | 14(1.87%)   | 17(30.9%)     |                     |
|                         | Higher    | 37(26.8%)     | 23(27.71%)  | 14(25.45%)    |                     |
| Occupation              | Employed  | 15(10.9%)     | 13(15.66%)  | 2(3.64%)      | x²=4.94, p<0.05, df=1 |
|                         | Unemployed| 123(89%)      | 70(84.34%)  | 53(96.36%)    |                     |
| Socio-economic status   | Class 1   | 34(24.6%)     | 19(22.89%)  | 15(27.27%)    |                     |
|                         | Class 2   | 27(19.6%)     | 10(12.05%)  | 17(30.9%)     |                     |
|                         | Class 3   | 22(15.9%)     | 11(13.25%)  | 11(20%)       |                     |
|                         | Class 4   | 26(18.8%)     | 20(24.1%)   | 6(10.91%)     |                     |
|                         | Class 5   | 32(23.2%)     | 23(27.7%)   | 9(16.36%)     |                     |

Table 1 shows out of 138 elderly patients of presbycusis 83(60.14%) were males and 55(39.86%) were females. 68 patients 49.28% were of age group 60-69 years, 42(30.43%) were of 70-79 years and 28 (20.3%) were more than 80 years. Majority of patients (62.32%) came from urban region and (37.68%) came from rural area. Overall presbycusis was found more in subjects of 60-69 years of age group (49.3%), Hindus (65.95%), in married males (83.13%), in unemployed (89.13%) subjects. The distribution of hearing loss in elderly patients of different marital and employment status was compared and significant association was found.
Table 2 Distribution of hearing loss of elderly patients as per their history of chronic illness

| Chronic illness | Status of patients | Male | Female | Total | Test of significance |
|-----------------|--------------------|------|--------|-------|----------------------|
| Hypertension    | YES                | 69(83.13%) | 37(67.3%) | 106(76.8%) | $\chi^2=4.67, \ P=0.03$ |
|                 | NO                 | 14(16.87%) | 18(32.3%) | 32(23.2%)  |                      |
| Diabetes mellitus| YES               | 16(19.27%) | 20(36.4%) | 36(26.1%)  | $\chi^2=5.01, \ P=0.025$ |
|                 | NO                 | 67(80.72%) | 35(63.6%) | 102(73.9%) |                      |

Table 2 shows that among studied subjects majority of males 69(83.13%) and majority of females 37(67.27%) were suffering from hypertension. Among males 16(19.27%) were suffering with diabetes mellitus and among females 20(36.36%) were suffering with diabetes mellitus. Association of hypertension and diabetes mellitus among both male and female patients suffering from hearing loss was found to be statistically significant ($p<0.05$).

Table 3 Distribution of hearing loss in elderly patients as per their symptoms

| Associated symptoms | Male | Female | Total | Test of significance |
|---------------------|------|--------|-------|----------------------|
| Tinnitus            | Yes  | 10(12.05%) | 15(27.27%) | 25(18.11%) | $\chi^2=5.17, \ P=0.023$ ($p<0.05$) |
|                     | No   | 73(87.95%) | 40(72.72%) | 113(81.9%)  |                      |
| Vertigo             | Yes  | 23(27.71%) | 25(45.45%) | 48(34.8%)   | $\chi^2=4.59, \ P=0.03$ ($p<0.05$) |
|                     | No   | 60(72.29%) | 30(54.55%) | 90(65.2%)   |                      |
| Total               | 83(100%) | 55(100%) | 138(100%) |                      |

Table 3 shows that 10 (12.05%) males and 15(27.27%) females were having tinnitus along with hearing loss. Proportion of female patients having tinnitus was found more than male patients. 23(27.71%) males and 25(45.45%) females were having vertigo along with hearing loss. Thus proportion of female patients having vertigo was also found more than male patients. Association of tinnitus and vertigo among both male and female patients with hearing loss was found to be statistically significant ($p<0.05$).

**Discussion**

In our study most of the patients were clustered in the age group 60-69 years. Only 28(20.29%) patients were above 80 years. In a similar study done by Ravindra sigh Bisht et al.\(^2\) in Uttarakhand in 2016; reported the similar finding that most of the elderly patients of hearing loss were of 60 years which coincided with the demographic data and surveys were done in India, which have shown that 56% and 62% have onset of hearing loss at $\geq$60 years of age in rural and urban backgrounds, respectively. In our study no of males having hearing loss is more than females having hearing loss. Out of 138 patients 83 (60.14%) males and only 55(39.86%) females had hearing loss. In a study done by Manish Sharma et al.\(^3\) male: female sex ratio was found 1.35:1 . Another study done in India by Trilok C Guleria et al.\(^4\) in Shimla Himanchal Pradesh hearing loss was more common in elderly males than females. Similar findings were reported by Hannula S. et al. in Northen Finland in which 36.8% elderly men and 18.4% elderly women were suffering from hearing loss.

In our study majority of patients were Hindu i.e. out of 138 patients 91(65.94%) were Hindu and 47(34.06%) were Muslims. This might be due to high population of Hindus in this region. Rest other religions are not seen in the study. Similar was also found by Ravindra singh Bisht\(^2\) in his study in Uttarakhand where Hindus contributed 95.6% and Muslims only 4.4%.

In this study 123(89.13%) patients were unemployed and 15(10.87%) were employed .In a study done by Susan et al\(^5\) it was found that hearing loss was the only factor that was
independently associated with all three measures of socioeconomic status: low educational attainment, low income, and unemployment/underemployment. In our study; it was observed that more no. of male patients 69(88.13%) (with hypertension) had hearing loss than female patients 37 (67.27%) (having hypertension). More no. of females (36.4%) suffering from Diabetes mellitus showed hearing loss than males (19.27%) suffering from diabetes mellitus.

Similar results were found in a study done by In Hwan Oh in which The prevalence rates of hearing loss were significantly greater in subjects with than without hypertension (10.9% vs. 6.6%, p<0.05) and in subjects with than without DM (17.3% vs. 6.5%, p<0.05). DM and hypertension, which are common degenerative diseases frequently accompanying aging, have been reported to be closely related to aging-related hearing loss. In our study it was observed that vertigo was more common in elderly females (27.27%) than males (12.05%). Tinnitus was observed more in elderly females (45.45%) than males (27.11%).

In a study done by L C Carmo in 2008 the incidence of tinnitus (64.4% and 72.5%, for men and women, respectively. They stated that such difference may be associated with the fact that they included in their study only elderly with one or more hearing complaints. About dizziness, there was a relationship with gender (p<0.05) being more common in the elderly women (20.0%). In their investigation done by Kamierczak & Doroszewska it was concluded that despite not finding any difference in the distribution of dizziness between elderly men and women, vertigo was more frequent in women.

**Conclusion and Recommendations**

In our study incident of hearing loss was more in elderly males than elderly females. A majority of patients lie in the age group 60-69 years (68;49.28%). There was a higher percentage of presbycusis reported among urban, married, unemployed Hindu male. Public should be educated about the problems elderly persons face due to their hearing loss and the persons having hearing loss him/herself should have knowledge how to cope with the problem. They should talk about their difficulty with their family and friends. Elderly persons should be counseled so that they can tell their friends and family about their hearing loss. An elderly person having hearing loss must 1) speak face to face so that you can see the faces. Watch face movement and see the expressions, it may help to understand better.2) Ask people to speak louder, but not shout. Tell them they do not have to talk slowly, just more clearly. 3) Turn off the TV or the radio if you aren't actively listening to it. 4) When you go to a restaurant, do not sit near the kitchen or near a band playing music. Background noise makes it hard to hear people talk. 5) Aware of your need for proper posture while doing your routine work if you are suffering from vertigo and tinnitus.

**References**

1. Varshney saurabh ,Deafness in India Published in “INDIAN JOURNAL OF OTOTOLOGY” Vol 22,issue 2 ,p.73-76
2. Bisht RS, Sikarwar V. Mina R, Arya A, An epidemiological study on hearing loss and its demographic charaterstics within Garhwal region of Utterakhand, Indian journal of otology,2016,Vol.22,Issue 2, pg105-109,
3. Jamwal P, Kishore K, Sharma Manish, Goel Mohit, Pattern of Sensorineural Hearing Loss In Patients Attending ENT OPD J K SCIENCE, Vol. 19 No. 1, Jan.-March 2017
4. Trilok C. Guleria1*, Shobha Mohindroo2, Narender K. Mohindroo1 , Ramesh K. Azad; Prevalence and etiology of hearing impairment in urban area of Shimla, Himachal Pradesh, India: a cross sectional observational study; International Journal of Research in Medical Sciences Guleria
5. TC et al. Int J Res Med Sci. 2017 Apr;5(4):1252-125

6. Susan D. Emmett, MD1,2 and Howard W. Francis, MD, MBA1 The Socioeconomic Impact of Hearing Loss in US Adults Published in final edited form as: Otol Neurotol. 2015 March ; 36(3): 545–550.

6. In-Hwan Oh,# 1 Jong Hoon Lee,# 2 Dong Choon Park, 3 MyungGu Kim, 4 Ji Hyun Chung, 5Sang Hoon Kim, 5 and Seung Geun Yeo 5Hearing Loss as a Function of Aging and Diabetes Mellitus: A Cross Sectional StudyPLoS One. 2014; 9(12): e116161. Published online 2014 Dec 30. doi: 10.1371/journal.pone.0116161

7. World Health Organization A global brief on hypertension. Silent killer, global public health crisis: World Health Day, vol. 1 (2013), pp. 1-40

8. NCD Risk Factor Collaboration (NCD-RisC) Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4.4 million participants Lancet, 387 (2016), pp. 1513-1530

9. LC Carmo, Audiological study of an elderly brazilian population – SciELO, 2008 www.scielo.br/pdf/rboto/v74n3/en_06.pdf.

10. Kazmierczak H, Doroszewska G. Metabolic disorders in vertigo, tinnitus, and hearing loss. Int Tinnitus J 2001;7(1): 54-8.