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AUDIOMETRIC EVALUATION OF ELDERLY PATIENTS WITH CARDIOVASCULAR COMORBIDITIES: OUR EXPERIENCE

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ABSTRACT

Background and Methods: The aim of the study is to study the Audiometric evaluation of elderly patients with cardiovascular comorbidities. All participants underwent medical and physical testing as well as psychosocial and cognitive testing. A thorough ENT examination and audiometric analysis were part of the medical testing in this study. The aim of the study is to study the Audiometric evaluation of elderly patients with cardiovascular comorbidities.

Results: The chi-square statistic is 2.0043. The p-value is .016856. The result is significant at $p < .05$. In our study we, 47% in Bilateral-hearing loss. The chi-square statistic is 90.8355. The p-value is < 0.00001. The result is significant at $p < .05$. The chi-square statistic is 6.4904. The p-value is .010846. The result is significant at $p < .05$.

Conclusion: We conclude that hearing impairment is frequent and progressive but that it leads to referral to an otolaryngolist and the prescription of a hearing aid in only a minority of the cases. Repeated audiometric screens are of limited value when the aim is to increase the use of hearing aids. Standardised follow up procedures of those with hearing loss are crucial, while attention to the self-perceived handicap may further increase the rate of hearing aid provisions. If these conditions are not met, efforts to screen on hearing loss will be fruitless and can best be avoided in general practice.

Key words: Audiometric, evaluation, cardiovascular & comorbidities.

INTRODUCTION

In view of this seemingly inevitable burden of disease, efforts to postpone disease and preserve good health in the elderly are becoming more important. Although major diseases of later life are associated with the presence of risk factors in earlier life, preventive efforts can still be fruitful at an older age[1]. Prevention at older age aims at increasing the ability of older adults to live independently by offering interventions to reduce or postpone mortality and the occurrence of disease or to improve functional status. For example, the treatment of hypertension is directed at the latter two endpoints whereas the prescription of a hearing aid is expected to reduce disability and handicap. Generally, the older a person becomes, the more the aim of prevention shifts toward improvement of functional status [2].

Hearing loss in elderly persons is a public health concern that is of increasing importance as the global population ages. Left untreated, hearing loss leads to diminished quality of life and has been associated with overall morbidity and mortality, as well as greater cognitive decline [3]. It is estimated to affect more than half of the adults older than 75 years in the United States, a population that is expected to double over the next 40 years.

This condition is clearly met by cardiovascular disease, as it is the most common cause of mortality and is one of the leading causes of limitations of activities in later life. Although in developed countries age-adjusted cardiovascular disease mortality rates tends to decrease since the seventies, it remains the most important cause of death [4].

Age-related hearing loss, which is hearing loss due to normal aging processes and likely genetically influenced, must be distinguished from sensor neural hearing loss that may accumulate with age but is not a result of normal aging [5]. Other factors that may affect auditory function include medical comorbidities, nutritional status, and noise-induced hearing loss. While the individual effects of each cause of hearing loss are often difficult to distinguish, it is important to study non-ARHL aetiologies because there may be modifiable risk factors to hearing loss that can relieve disease burden if addressed [6].

MATERIAL & METHODS

Present study was conducted from Jan 2021 till June 2023.

All participants underwent medical and physical testing as well as psychosocial and cognitive testing. A thorough ENT examination and audiometric analysis were part of the medical testing in this study. The hearing loss data collected from

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each audiogram included hearing thresholds measured in decibels hearing level (dB HL) at 0.25, 0.5, 1, 2, 3, 4, 6, and 8 kHz, as well as the word recognition score (WRS). The audiologist's assessment of the type of hearing loss was also recorded. For each patient, the mean of the hearing thresholds at 0.5, 1, and 2 kHz was calculated and termed the low-frequency pure-tone average (LFPTA) to distinguish it from a high-frequency pure-tone average (HFPTA), similarly calculated from the thresholds at 3, 4, 6, and 8 kHz. Patients were represented by the better threshold or pure-tone average of 2 ears.

The sex of each participant was noted, and the remainder of the medical record was examined for comorbidities related to hearing loss. The comorbidities investigated were all forms of cardiovascular disease or risk factors.

Inclusion Criteria:

1.Age ≥60 years of age

Exclusion Criteria:

1. Informed consent was obtained from each participant before the ENT visit and the collection of clinical data.
2. Each patient gave approval for the processing of personal data anonymously for a possible study.

RESULTS

Table No. 1: Age Distribution

Age (years)	With comorbidities			Without Comorbidities		
	Male	Female	Total	Male	Female	Total
60-70	11	7	18	13	8	21
71-80	18	15	33	15	16	31
81-90	30	19	49	27	21	48
	59	41	100	55	45	100

The chi-square statistic is 0.4041. The *p*-value is .817055. The result is *not* significant at $p < .05$.

In our study we maximum cases in age group of 81-90 (49%)

Table No. 2: Overall distribution of hearing

	With comorbidities		Without Comorbidities	
	n	%	n	%
Normal hearing	45	45	59	59
Bilateral hearing loss	40	40	33	33
Unilateral hearing loss	15	15	8	8
Total	100	100	100	100

The chi-square statistic is 2.0043. The *p*-value is .016856. The result is significant at $p < .05$.

In our study we, 37% in Bilateral -hearing loss.

Table No. 3: Overall severity of hearing loss in our study

Severity of Hearing Loss	With comorbidities		Without Comorbidities	
	n	%	n	%
Mild	26	47.27	19	46.34
Moderate	17	30.91	13	31.71
Severe	12	21.82	9	21.95
Total	55	100.00	41	100

The chi-square statistic is 0.0046. The result is significant at $p < .05$.

Table No. 4: Cardiovascular Comorbidities

Comorbidity	n	%
Hypertension	63	63.00
CVA	22	22.00
CAD	15	15.00

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Total	100	100.00

The chi-square statistic is 90.8355. The result is significant at $p < .05$.

Table No. 5: LFPTA/ HFPTA

	Hypertension	Cerebrovascular Disease	Coronary artery Disease	Total
LFPTA	17	7	5	29
HFPTA	20	4	2	26
Total	37	11	7	55

The chi-square statistic is 6.4904. The p-value is .010846. The result is significant at $p < .05$.

DISCUSSION

Hearing aid provision in this sample of the elderly people living independently was disappointingly low after a single hearing screen. We hypothesised that a second screen would increase awareness and promote rehabilitation. The added value of the repeated screen was limited to a hearing-aid provision in only an additional 7.4% of the participants with hearing loss [7&8].

The number of patients with hearing loss that had a hearing aid prescribed after a single audiometric screening (12.5%) is lower than that reported in the literature [9]. Other studies of hearing screens in general practice show a hearing aid prescription rate of 19%, 28% and 49% respectively among elderly with hearing loss [10].

Since these surveys specifically aimed at detecting hearing problems, they might have attracted more motivated elderly than those who attended our health check, in which the audiogram comprised only a small part of the measurements [11]. Furthermore, these higher rates may be attributable to a more intensified follow-up of the hearing impaired participants. This suggests that general practitioners should be prepared to invest more time and effort in an adequate follow up of identified people with a hearing loss in case audiometric screens are performed [12].

Individuals with underlying medical conditions experienced greater hearing impairment in both low-frequency and high-frequency ranges compared to the control group. This is likely attributed to reduced blood flow affecting the inner ear. The type of hearing loss observed is primarily sensorineural and tends to worsen gradually as age advances.

Audiometric examinations have certain limitations. They are performed in a quiet room, while hearing problems can be most apparent in conversations in noisy environments. Furthermore, they measure only loss and not the way the patient deals with this loss in daily life[13]. Therefore, one could screen on hearing handicap instead of hearing loss by using a questionnaire. It has been shown that help seeking behaviour is higher when the perceived handicap is higher [14]. Thus, screening by means of a combination of a questionnaire and audiometry and subsequently offering a hearing aid is likely to be more efficient than audiometric screening alone. In our study, the presence of complaints was associated with a higher hearing aid use after the screening[15].

CONCLUSION

We conclude that hearing impairment is frequent and progressive but that it leads to referral to an otolaryngolist and the prescription of a hearing aid in only a minority of the cases. Repeated audiometric screens are of limited value when the aim is to increase the use of hearing aids. Standardised follow up procedures of those with hearing loss are crucial, while attention to the self-perceived handicap may further increase the rate of hearing aid provisions. If these conditions are not met, efforts to screen on hearing loss will be fruitless and can best be avoided in general practice.

Conflicts of interest: none
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