



The relationship of hearing loss with dizziness and tinnitus in the elderly population

A relação da perda auditiva com tontura e zumbido na população idosa

La relación entre la pérdida auditiva, mareos y tinnitus en adultos mayores

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Abstract

Introduction: Hearing loss related to symptoms of dizziness and tinnitus may be a limiting factor reported by elderly population with psychosocial consequences. Objectives: To verify the relationship between hearing loss and complaints related to dizziness, tinnitus and communication disorders in the elderly population. **Method:** This is a retrospective study that included the analysis of 468 records of elderly people enrolled in the period from 2011 to 2015 in Rehabilitation Service. Data regarding age, gender, self-reported complaints of tinnitus, difficulty in understanding speech and dizziness, as well as the results of audiometric evaluation (presence or absence of hearing loss), symmetry and degree of hearing loss and laterality were collected. **Results:** The sample consisted of 295 (63%) records of female subjects and 173 (37%) males with a mean age of 72.7 years. The complaint “listen and not understand” was found in 64.7% of the elderly followed by complaint of tinnitus (45.1%) and dizziness (20,3%). It has been observed that dizziness has a significant relationship with complaining about not understanding

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speech ($p<0,001$; $R=0,17$) and between tinnitus and dizziness. ($p<0,001$; $R=0,32$). It can be observed that 77.7% of the subjects presented losses classified as moderate to moderately severe, symmetrical (80.6%) and bilateral (96.8%). Conclusion: Based on these findings, local managers will be able to prepare adequate management to improve the quality of service and life of this elderly population.

Keywords: Hearing Loss; Dizziness; Tinnitus.

Resumo

Introdução: A perda auditiva relacionada a sintomas de tontura e zumbido pode ser um fator de limitação do idoso com consequências psicossociais. Com o decorrer da idade as alterações vestibulares e outros sintomas auditivos associados aumentam. **Objetivos:** Verificar a relação da perda auditiva e queixas relacionadas à tontura, zumbido e distúrbios da comunicação em uma população de idosos. **Método:** Trata-se de um estudo retrospectivo que contou com análise de 468 registros de idosos cadastrados no período de 2011 a 2015 em Serviço de Reabilitação Auditiva. Foram coletados dados referentes à idade, sexo, queixas auto relatadas de zumbido, dificuldade de compreensão de fala e tontura, bem como os resultados da avaliação audiométrica, simetria entre as orelhas no caso de perda auditiva, grau de deficiência auditiva e lateralidade. **Resultado:** A amostra foi composta por 295 (63%) prontuários de sujeitos do sexo feminino e 173 (37%) do sexo masculino com idade média de 72,7 anos. A queixa “ouvir e não compreender” foi encontrado em 64,7% dos idosos seguido por queixa de zumbido (45,1%) e tontura (20,3%). Observou-se que a tontura tem relação significativa com queixar-se de não entender a fala ($p<0,001$; $R=0,17$) e presença de zumbido ($p<0,001$; $R=0,32$). Em 77,7% dos prontuários houve o registro de perdas classificadas como moderada a moderadamente severa, do tipo simétrica (80,6%) e bilateral (96,8%). **Conclusão:** A partir destes achados, gestores locais poderão elaborar um planejamento adequado, visando à melhoria na qualidade do serviço e de vida desta população idosa.

Palavras-chave: Perda Auditiva; Tontura; Zumbido.

Resumen

Introducción: La pérdida auditiva relacionada con síntomas de vértigo y tinnitus puede ser un factor limitante en adultos mayores con consecuencias psicosociales. Con el aumento de la edad las alteraciones vestibulares y otros síntomas auditivos asociados aumentan. **Objetivos:** Verificar la relación entre pérdida auditiva y quejas relacionadas a vértigo, tinnitus y disturbios de la comunicación en una población de adultos mayores. **Método:** Se realizó un estudio retrospectivo que incluyó el análisis de 468 registros de adultos mayores, matriculados en el período de 2011 a 2015 en los Servicios de Rehabilitación Auditiva. Se recogieron datos en cuanto a edad, sexo, quejas auto relatadas de tinnitus, dificultades de comprensión del habla y vértigo, así como los resultados de la evaluación audiométrica, simetría entre los oídos en los casos de pérdida auditiva, grado de la pérdida auditiva y lateralidad. **Resultados:** La muestra estuvo constituida por 295 (63%) registros de sujetos del sexo femenino y 173 (37%) del sexo masculino, con un promedio de edad de 72,7 años. La queja “oir y no entender” se encontró en el 64,7% de los adultos mayores, seguido por la queja de tinnitus (45,1%) y vértigo (20,3%). Se observó que el vértigo tiene una relación significativa con la queja de no entender el habla ($p<0,001$, $R=0,17$) y el tinnitus ($p<0,001$, $R=0,32$). En el 77,7% de los registros se encontró anotaciones a respecto de pérdidas clasificadas de moderadas a moderadamente severa, de tipo simétrico (80,6%) y bilateral (96,8%). **Conclusión:** Con base en esto allazgos, los administradores locales podrán diseñar una planificación adecuada con el fin de mejorar la calidad del servicio y la vida de esta población de adultos mayores.

Palabras claves: Pérdida Auditiva; Vértigo; Tinnitus

Introduction

The Política Nacional de Saúde da Pessoa Idosa (National Policy for the Health of the Elderly), established by the Ministry of Health, has assumed, with the municipal and state health spheres, the commitment to invest in the quality of care provided by the Sistema Único de Saúde - Unified Health System - (SUS) to people over 60 years old. Since projections point to the fact that, in 2025, Brazil will be the sixth largest elderly population in the world¹.

According to the National Institute on Deafness and Other Communication Disorders (NI-DCD), 30-35% of adults aged between 65 and 70 years old present some degree of hearing loss. That percentage rises to 40-50% in individuals over 75 years of age. Unfortunately, a large number of elderly people do not receive the appropriate treatment for this deficiency, which can adversely affect the activities of daily living. The association between the severity of age-related hearing impairment and the impairment of daily activities was investigated and found in 1952 participants over 60 years of age².

Particularly in Brazil, the elderly can count on the Política Nacional de Atenção à Saúde Auditiva - National Policy on Auditory Health Care - (PNASA), which allows the evaluation and subsequent grant of hearing aids.

The use of hearing aids can contribute positively to the "recovery" of this ability, because improving the quality and intensity of the peripheral signal favors the processing of this information until it reaches the cognitive system³.

Researchers studied whether hearing aid use is associated with better cognitive performance and social isolation and / or depression, in a sample composed of 164,770 adults in the United Kingdom, aged between 40 and 69 years old, who underwent complete audiological evaluation. This research found that the use of hearing aid was associated with an improvement in cognition, regardless of social isolation and depression. This finding was consistent with the hypothesis that hearing aids may improve cognitive performance⁴.

One complaint presented by the elderly population is the difficulty in hearing and understanding a conversation. In a research carried out with this population, it was recorded that older listeners need a signal-to-noise ratio bigger than younger

adults by 3 dB (S / R + 3), due to auditory aging and possibly slower temporal auditory processing⁵.

A study carried out in São Paulo, involving 191 elderly users of hearing aid, older than 60 years old, between October 2012 and January 2013, had the objective to identify the population profile of the elderly referred to hearing aid fitting process selection. The study showed that regarding auditory perception, 96% reported some difficulty in hearing, with 94 (51%) reporting the difficulty as regular and 81 (44%) as bad. Of this sample, 55% had moderate hearing loss⁶.

Another study, with 2,751 elderly residing west of Sydney, Australia, with the objective to assess the prevalence of dizziness / vertigo showed that the prevalence of dizziness / vertigo was 36.2%. Tinnitus was associated with dizziness and the results pointed out that dizziness / vertigo had a greater impact on the quality of life of the elderly population studied⁷.

With the passage of age, vestibular changes and other associated symptoms increase. A study regarding the clinical, epidemiological and treatment characteristics of elderly subjects with labyrinth diseases, performed through the survey of 200 medical records in the period from 2008 to 2011, observed that the average age of the subjects was 70.5 years old. The most frequent complaints were: non-rotational dizziness in 74.5%; tinnitus in 56.5%; hearing loss in 49%; vertigo in 9.5% (n = 19); imbalance in 5% (n = 10); association between dizziness and tinnitus in 2.5% (n = 5); association between labyrinth and bilateral hearing loss in 30% (n = 60); hearing loss in the right ear in 6% (n = 12) and hearing loss in the left ear in 13.5% (n = 27); and association between labyrinth and tinnitus in 56.5% (n = 113). In this study, the increase related to hearing loss and tinnitus in the elderly was observed. The authors concluded that epidemiological data, symptoms and comorbidities are important for the clinical and therapeutic planning of the elderly population to minimize the impacts resulting from these alterations⁸.

Vertigo and dizziness are very common in the elderly population. A study carried out with 120 elderly individuals over 65 years of age, with vestibular dysfunction, observed that rotational and non-rotatory dizziness were present in 68.3%, with 45.8% presenting daily dizziness. Concerning the associated auditory symptoms, 70.8% presented tinnitus, 60% had an auditory deficit and 54.2%

pressure sensation / aural fullness. Regarding falls, at least one fall in the last year was reported in 53.3% of the sample with chronic vestibular dysfunction⁹.

Regarding this scenario, it is fundamental to collect the data of medical records, for an adequate clinical and therapeutic planning of this elderly population with vestibular and auditory alterations, in order to minimize the resulting impacts and improve the quality of life.

The objective of this study is to verify the relationship between hearing loss and complaints related to dizziness, tinnitus and communication difficulties in the elderly population.

Method

This research is part of the project entitled “Relações entre equilíbrio, audição e cognição do idoso” (Relationship between balance, hearing and cognition of the elderly), approved by the number 445052 / 2014-7 and by the Ethics Committee of the University under the CAEE number: 43831015.1.0000.5482. This was a descriptive and analytical retrospective study, with the data collection performed through the medical files consultation in the Serviço de Reabilitação Auditiva (Auditory Rehabilitation Service) of the city of Jacareí - SP. According to the SEADE Foundation (2011), the city presented, approximately, 213,155 inhabitants, including 23,486 people equal or older than 60 years of age (11.01% of the total population).

Four hundred sixty eight (468) medical records of patients over 60 years of age, submitted to auditory evaluation, were identified, selected and registered in the aforementioned sector, in the period from 2011 to 2015.

Medical records of elderly individuals with altered results in acoustic immittance evaluation, it means that subjects with curve types B, C., Ad, As were excluded. All the elderly with otorhinolaryngology's indication, diagnosed with age-related hearing loss, with thresholds in the frequencies from 250 to 8000 kHz, higher than 25 dBNA, awaiting the process of selection and fitting of hearing aids were included in the study.

From the medical records, the following demographic data were considered: gender, age over 60 years of age and results of audiological tests,

namely: degree of hearing loss and symmetry between the ears, whether it was unilateral or bilateral. The presence of self-reported complaints related to tinnitus, dizziness, hearing, but not understanding were also considered. The data were analyzed separately and were not associated.

The data were tabulated and processed by the SPSS 21.00 software. The bivariate correlation test with the Spearman's coefficient was used to analyze the relationship between hearing loss, dizziness, tinnitus and communication difficulties variables. Alpha values were considered significant when they were smaller than or equal to 0.05. The beta value allowed was 0.1.

Results

The sample consisted of 295 (63%) medical records of female subjects and 173 (37%) of male subjects, with an average age of 72.7 years old (the minimum age was 60 years old and the maximum was 94, SD 8,64).

The study shows that, in the analyzed group, 53.8% of the losses are classified as moderate. The “hearing but not understanding” complaint was found in 35.3% of the elderly, followed by tinnitus (45.1%) and dizziness (20.3%). It was observed that dizziness has a significant relationship with complaining about not understanding speech ($p < 0.001$, $R = 0.17$) and between tinnitus and dizziness ($p < 0.001$; $R = 0.32$). It can be observed that 77.7% (364) of the subjects presented losses classified as moderate to moderately severe, symmetrical (377-80.6%) and bilateral (453-96.8%). Regarding the complaints, 45.1% (211) of the sample reported having tinnitus, 20.3% (95) dizziness and 35.3% (165) hearing, but not understanding, as shown in table 1.

As it can be seen in table 2, when applying the bivariate correlation test, there was a significant positive relation between dizziness and the self-reported complaint of difficulty in understanding speech, tinnitus presence and asymmetric and bilateral hearing loss variables, and, also, between difficulty in understanding speech and the asymmetric and bilateral hearing losses and tinnitus variables. There was another correlation between moderate to moderately severe hearing loss and difficulty in understanding speech ($P < 0.001$; $R = 0.30$).

Table 1. Characterization of the elderly sample, according to the degree of hearing loss and complaints related to tinnitus, dizziness and "hearing, but not understanding" (n = 468).

VARIABLE		n	%
Characterization of hearing loss			
Degree of loss	Mild	38	8,1
	Moderate	252	53,8
	Moderately severe	112	23,9
	Severe	52	11,1
	Deep	14	3,0
	Symmetric	377	80,6
	Asymmetric	91	19,4
	Bilateral	453	96,8
	Unilateral	15	3,2
Complaints			
Tinnitus	Presence	211	45,1
	Absence	257	54,9
Dizziness	Presence	95	20,3
	Absence	373	79,7
Hearing, but not understanding	Presence	165	35,3
	Absence	303	64,7

Table 2. P Values and Correlation Coefficient (R) of the analysis between the variables - Characteristics of symmetrical hearing loss, bilateral hearing loss, difficulty in understanding speech and tinnitus.

Variables		Dizziness	B.H.L.	D.U.S.	Tinnitus
B.H.L.	P	0,047*	-	-	-
	R	0,092	-	-	-
D.U.S.	P	<0,001*	0,042*	-	-
	R	0,172	0,094	-	-
Tinnitus	P	<0,001*	0,515	<0,001*	-
	R	0,322	-0,03	0,228	-
S.H.L.	P	0,013*	<0,001*	0,026*	0,244
	R	0,114	0,217	0,103	-0,054

Legend: p = Significance value; R = Correlation Coefficient; B.H.L. = Bilateral Hearing Loss; S.H.L. = Symmetrical Hearing Loss; D.U.S. = Difficulty in Understanding Speech * Bivariate correlation test (Spearman's Coefficient)

Discussion

The fact that this study is a medical record survey with audiological and otoneurological complaints limited our research. Although there is a Speech, Language and Hearing Sciences care service to the elderly, in the Serviço de Reabilitação Auditiva (Auditory Rehabilitation Service), there is no health care policy for the elderly in the municipality, nor integral or integrated actions or programs for elderly health care.

It was observed, in this study, that 53.8% of the sample presented moderate hearing loss and the average age found was 72.73 years old. This finding corroborates with the study carried out in

São Paulo, with 191 elderly people that found the prevalence of 55% of the population with moderate disability and 60% of the sample with an average age of 75.2 years old⁶.

Our findings demonstrate that 77.7% of the losses are classified as moderate to moderately severe, which may lead to communication difficulties. It is interesting to observe that, although there are an expressive percentage of subjects with hearing loss, the same proportion was not found when the "hearing, but not understanding" complaint (35.3%) was analyzed. There was also a correlation between moderate to moderately severe hearing loss and speech difficulty (P <0.001; R = 0.30),

which was expected, due to the degree of hearing loss in this population^{7,14}.

Studies have shown that, the greater the magnitude of hearing loss, the greater the likelihood of social isolation. The hearing loss of this population has an impact on communication and quality of life, as well as in the use of individual sound amplification device and assistive technology. These can improve the quality of life of this population, since abilities to communicate and to reintroduce into social life can be recovered^{7,10,11}.

If this situation of hearing loss is not reviewed, we will face what Debet calls the “privatization of old age”, that is, the gradual removal of the State from its protection function, delegating to families the responsibility for attending to situations of physical vulnerability of the elderly¹².

In this study, it was also verified that almost half of the sample (45.1%) presented tinnitus complaints. These findings can be compared to the study conducted in Brazil, with 498 subjects over 60 years old, regarding the prevalence of tinnitus in 47% of the subjects of the research, and with another study with 200 elderly people, in which the prevalence of tinnitus was 56.5%^{8,20}.

The “hearing, but not understanding” complaint was found in 35.3% of the elderly with hearing loss. Depending on the circumstance, speech comprehension may require more or less auditory effort, and speech recognition is worsened if background noise is present^{6,14}.

This fact alerts to the need for Speech, Language and Hearing Sciences services to focus their actions, not only on diagnostic and auditory rehabilitation actions. They should be responsible for the reception of the elderly, accompanying the difficulties not only for communication, but seeking a better psychosocial adjustment of them^{4,7,10}.

It should be remembered that this broader view meets with what is recommended by the International Classification of Functioning, Disability and Health (ICF), in which it is evident how sensorial changes influence and limit the daily life of the subjects.

Conclusion

With the passage of age, otoneurological problems increase, as we can observe in our study. For example, the “hearing, but not understanding” complaint observed in 35.3% of the elderly, the

prevalence of tinnitus in 45.1% and dizziness in 20.3%. Based on these findings, local managers will be able to prepare adequate planning, aiming at improving the quality of service and life of this elderly population.

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