Original Article

Association Between Hearing Loss and Depressive Symptoms in Elderly

Associação entre Perda Auditiva e Sintomatologia Depressiva em Idosos

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SUMMARY

Introduction: Hearing loss causes difficulties in speech understanding, which leads away from the family and social environment. This isolation may be associated with depressive disorders. Type of study: clinical prospective.

Objective: To determine the association between hearing loss and depression in a group of non-institutionalized elderly.

Method: The sample consisted of individuals aged over 60 years, undergoing complete audiological evaluation and screening for depressive symptoms with the Geriatric Depression Scale (GDS).

Results: We evaluated 54 elderly, 26 (48.1%) were female and 28 (51.9%) males. It was found that 39 (72.2%) had hearing thresholds change, and 17 (31.5%) with mild hearing loss and 22 (40.7%) with moderate hearing loss. Were evident signs of depression in 25 elderly (46.3%), and 22 (40.7%) had hearing loss. Data analysis showed an association between hearing loss and depression (p = 0.016). Although not significant (p = 0.18), the association between the degree of hearing loss was positive in relation to the severity of the signs of depression.

Conclusion: In elderly people surveyed, there was a strong association between hearing loss and signs of depression and tendency to be an association between the degree of hearing loss and the severity of the signs of depression.

Keywords: depression, hearing loss, aging.

RESUMO

Introdução: A perda auditiva provoca dificuldades na compreensão da fala, o que origina afastamento do meio familiar e social. Este isolamento pode estar associado a quadros depressivos. Tipo de estudo: clínico prospectivo.

Objetivo: Verificar a associação entre perda auditiva e depressão em um grupo de idosos não institucionalizados.

Método: A amostra foi composta por indivíduos com idade igual ou superior a 60 anos, submetidos à avaliação audiológica completa e rastreio de sintomatologia depressiva com a escala de depressão geriátrica (GDS).

Resultados: Foram avaliados 54 idosos, sendo 26 (48,1%) do sexo feminino e 28 (51,9%) do sexo masculino. Constatou-se que 39 (72,2%) apresentaram limiares auditivos alterados, sendo 17 (31,5%) com perda auditiva leve e 22 (40,7%) com perda auditiva moderada. Foram evidenciados sinais de depressão em 25 idosos (46,3%), sendo que 22 (40,7%) apresentavam perda auditiva. A análise dos dados evidenciou associação entre a presença de perda auditiva e depressão (p=0,016). Apesar de não significativa (p=0,18), a associação entre o grau de perda auditiva foi positiva em relação à gravidade dos sinais de depressão.

Conclusão: Nos idosos pesquisados, ocorreu forte associação entre a perda auditiva e os sinais de depressão e tendência a existir associação entre o grau de perda auditiva e a gravidade dos sinais de depressão.

Palavras-chave: depressão, perda auditiva, envelhecimento.

Introduction

Aging is a global reality, even in the poorest countries. In Brazil, especially, the process is occurring in a radical and rapid, indicating that in 2020, the country occupies the sixth place in number of elderly (1). This process causes a series of changes in functional systems, and gradually irreversible, with intensification of sensory and motor limitations, as well as the onset or worsening of chronic degenerative diseases (2).

The declining ability to hear in the elderly is called presbycusis. Studies show that in Brazil the prevalence of hearing loss in this population varies between 36% and 81% (3.4). Aging, however, cannot be considered the only factor that causes hearing loss, since a series of negative factors intrinsic and extrinsic factors can cause or exacerbate hearing disorders, such as the occupation of the individual, the use of ototoxic drugs, exposure to noise made by individuals and diseases (diabetes, hypertension, atherosclerosis - e.g.) (3, 5, 6).

Studies have shown that presbycusis begin in the third decade of life, and the effects observed after the fifth decade (7). Hearing loss is usually sensorineural, symmetric, descending with audiometric configuration predominantly in men and women in the horizontal (8, 9). The degree varies from mild to moderately severe, and the hearing of men is more affected than women. The worsening of hearing loss is directly related to increasing age (6, 8, 10).

Presbycusis causes social unrest, emotional and psychological stress, with reduced social life, increase in relationship problems with family, friends and work. These disorders affect negatively the mobility and activities of daily living (11, 12, 13).

Among the psychological problems seen in elderly patients with hearing loss are depressions (12, 14, 15, 16, 17). This association may be largely due to social isolation, as well hear is an important prerequisite for social interaction (13, 18)

Depression is one of the most common mental disorders in the elderly. Between 15% and 30% of individuals in this group have depressive symptoms, and no treatment may be associated with physical decline, illness, decreased quality of life and mental decline (19, 20). Studies show that depression primarily affects the elderly (compared with groups of adults and youth) (21), with higher prevalence in females (22, 23, 24).

Considering the theoretical assumptions described in the literature, which refer to a relationship between hearing loss and depression, this study aims to determine the association between the presence and degree of hearing loss and depressive symptoms in a group of non-institutionalized elderly.

Method

This study was cross sectional, observational and prospective. The sample consisted of individuals aged 60 years or more (25). Among the inclusion criteria were: age within the age criteria, signing an informed consent, absence of obstructive wax in the ear canal and completion of assessments selected for the survey.

To conduct the study, subjects underwent audiological evaluation and screening of depressive symptoms. The audiological evaluation consisted of pure tone audiometry, performed on acoustic hood, a survey of hearing thresholds by air (from 250 Hz to 8000 Hz) and bone (500 Hz to 4000 Hz), using brand *Interacoustics* audiometer Model AD-28. There were also the speech audiometry (Percentage Index of Speech Recognition and Speech Reception Threshold) and acoustic immittance measures. Search for tympanometry and acoustic reflex, we used the middle ear analyzer brand *Interacoustics,* model AT235.

The presence and degree of hearing loss were determined using the classification of the World Health Organization, with the average hearing thresholds by air in the frequencies of 500 Hz to 4000 Hz Mean values between -10 and dBHL 25dBNA indicate that the person has normal hearing, and between 26dBNA 40dBNA, mild hearing loss, and between 41dBNA 60dBNA, moderate hearing loss, and between 61dBNA 80dBNA severe hearing loss and average thresholds above 81dBNA, profound hearing loss. For this work we considered the mean of the better ear (26).

Screening for depressive symptoms was done by the Geriatric Depression Scale (GDS) (27). This instrument has been translated and validated in Brazil (28), consists of fifteen items, the individual being asked to mark yes or no after each question. The application was done individually, in a waiting room, after hearing evaluation.

According to the rules of interpretation of the GDS, with each answer that showed a downward trend was attributed to (1) point. The assessment was made as follows (29):

- less than 5 points: no depressive symptoms;
- between 5 and 10 points: mild to moderate depressive symptoms;
- 11 points or more: severe depressive symptoms.

After completion of the assessment was created a database for later quantitative statistical analysis. Were considered statistically significant p values less than or equal to 0.05.

Descriptive analysis of quantitative variables was performed by calculating the absolute frequencies, mean and standard deviation. To calculate the associations between the presence / absence of hearing loss and depressive symptoms and degree of hearing loss and level of depressive symptoms was performed using chi-square.

This research is part of the project 'Characterization of elderly patients in project extension officer', adopted by the Ethics Committee of University Research (CER) protocol as 125H.

Results

This research was carried out to verify the existence of an association between the presence and degree of hearing loss and depressive symptoms in a group of non-institutionalized elderly.

We evaluated 54 individuals from 60 to 84 years with a mean age of 70.4 ± 7.16 years, 26 (48.1%) were female and 28 (51.9%) males.

Regarding the hearing, according to data presented in Table 1, was found hearing loss in most individuals in the sample. The degree of hearing loss ranged from mild to moderate.

The data analysis of geriatric depression scale showed that of the 54 elderly patients, 25 subjects had depressive symptoms (46.3%), as shown in Table 2.

The data presented in Table 3 show that there was an association between hearing loss and depression (p = 0.016), since, of 25 (46.3%) elderly with depression, 22 (40.7%) had hearing loss .When we analyzed the association between the degree of hearing loss and depressive symptoms, there was, however, a significant association (p=0.18). It was noted, however, positive trend in the severity of the signs of depression. That is, the greater the hearing loss the greater the severity of the signs (Table 4).

Discussion

Considering the increasing life expectancy and high prevalence of hearing loss in the elderly population, it is important to check the interference of this change in the psychosocial aspects.

Table 1. Presence and degree of hearing loss in the sample components.

	n	%
Normal hearing thresholds	15	27.8
Mild hearing loss	17	31,5
Moderate hearing loss	22	40,7
Total	54	100

Legend: n = absolute values, % = percentages.

Table 2. Presence of depressive symptoms among the sample components.

Depressive symptoms	n	%
Absent	29	53,7
Mild to moderate	23	42,6
Severe	2	3,7
Total	54	100

Legend: n = absolute values, % = percentages.

Table 3. The presence of hearing loss and depression in elderly individuals in the sample.

Hearing	Depressive symptoms			
	Present		Absent	
	n	%	n	%
Normal hearing thresholds	3	5,6	12	22,2
Hearing loss	22	40,7	17	31,5
Total	25	46,3	29	53,7

p = 0,016*

Legend: n = absolute values, % = percentage values, p = significance level.

With regard to depression, it was found that 25 elderly (46.3%) had depressive symptoms of mild to profound. This value is higher than that described in the literature. Previous work in the country, using the same instrument in this study (GDS) showed that approximately 30% of non-institutionalized elderly showed symptoms of depression (23, 30, 31). It is noteworthy, however, that in these studies did not observe the auditory condition of the sample components.

The data analysis showed that, in the study group, most of the elderly had hearing loss (72.2%). This is higher than some studies reviewed (3, 6) and less than others (4). As described previously, the prevalence of presbycusis cited in the literature varies widely (from 36% to 81%) believed that this variation may occur due to the characteristics of the samples. It is noteworthy, however, that the study of Beria, Raymann, Giant, Figueiredo, Jotz, Roithmann et al (4) evaluated a group of elderly in the South, as in this work, but with larger sample size.Thus, it is believed that if there was an increase in the number of the sample, the percentage of seniors with hearing loss

Table 4. Depressive symptomatology and degree of hearing loss.

Hearing	Depressive symptoms					
	Absent		Mild to moderate		Severe	
	n	%	n	%	n	%
Normal hearing thresholds	12	22,2	3	5,6	0	0
Mild hearing loss	8	14,8	8	14,8	1	1,9
Moderate hearing loss	9	16,7	12	22,2	1	1,9
Total	29	53,7	23	42,6	2	3,8

p=0,18

Legend: n = absolute values, % = percentage values, p = significance level.

would be equivalent, especially because it is a similar population (elderly and the capital's metropolitan area of RS).

As to the degree it was found that hearing loss presented by the patients included ranged from mild to moderate. This echoes the most data reported in the national literature (3, 6, 10) and international (9). The mild hearing loss are not considered disabling by the World Health Organization (26). One must consider, however, that studies on the acoustics of phonemes of Brazilian Portuguese (32) show that sounds very important for speech discrimination, such as fricatives, exhibit very low intensity (about 15dBNA). Thus, mild hearing loss should be considered important and worthy of intervention, since they cause disturbances in speech understanding and can contribute to the social isolation of the individual, causing or exacerbating emotional and psychosocial disorders.

Analyzing the relationship between the presence / absence of depressive symptoms and presence / absence of hearing loss, it was found that there was a significant association (p = 0.016).The results showed that in the studied group, the presence of hearing loss is contributing to the presence of psychological disorders. It is believed that this fact can be partially explained by the removal of social and family relationships, since the auditory disorders impede, partially or totally, the effective communication between individuals and negatively affect social relations (11, 12, 13, 14 , 15, 16, 17, 18, 33, 34), both by the lack of understanding of the elderly, and the lack of silent environment (most appropriate for auditory discrimination task) and even unprepared to make the caller understand (speech more articulated and paused).

When comparing the results obtained in the degree of hearing loss / depression symptoms, it was found, however, that there was no significant association (p = 0.18). Although not significant (p=0.18), the association between the degree of hearing loss was positive in relation to the severity of the signs of depression. That is, the greater the hearing loss, the greater the severity of the signs of depression. The data revealed, then trend to this association, since the 29 elderly (53.7%) with absence of depression, most had normal hearing (22.2%).Considering the 23 (42.6%) patients with mild to moderate depression, only three (5.6%) had normal hearing. The others had mild hearing loss (14.8%) or moderate (22.2% .) Individuals with severe depression (3.8%) had mild hearing loss (1.9%) or moderate (1.9%).

Less consistent or weaker relationships between hearing loss and depression in the elderly have been reported by other authors (35, 36). This fact can be attributed to psychological adaptation to hearing loss, which varies from individual to individual, which occurs through a set of social and psychological processes (37, 38).

Another factor that should be taken into consideration is that depressive symptoms may be related to difficulties in speech understanding experienced by the elderly, but that such difficulties are not directly related to the changing level of hearing. In a study by Magalhães and Goffi-Gomez (39), it was found that older adults with the same degrees of hearing loss had a different index values of speech recognition probably due to the physiological substrate of presbycusis (cochlear or retrocochlear alterations).

Conclusion

It is concluded that there was, in the elderly surveyed, a strong association between hearing loss and signs of depression and tendency to be an association between the degree of loss and severity of the signs of depression.

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