

Characterization of Complaints, Type of Hearing Loss and Therapy for Elderly People Seen at a Private Clinic in Belém - PA - Brazil

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SUMMARY

Introduction: This paper aimed to make a retrospective study, hearing complaints, type of hearing loss and treatment for elderly people seen at a private office in Belem - PA from 2000 to 2005, checking if gender and age are sources of variability.

Method: 163 medical files were considered. Patient's age ranged from 60 to 89. The following data were collected: otological history, hearing evaluation and the treatment.

Results: The results showed that hearing loss was the most common complaint. In relation to the type of hearing loss, the most frequent was the bilateral sensorineural (62.4%) followed by bilateral mixed (6.8%) and bilateral conductive (5.6%). For the groups aged 60-69 only clinical treatment was observed (59.9%). For the group aged 80-89 it was observed a raise in the clinical treatment (11.1%) compared to hearing aids 5(3.1%), however for this age group the hearing aid treatment was higher than to the other groups.

Conclusion: The population in this study have more females, the hearing loss was the most common complaint: the sensory hearing loss is not the only type of loss found among the elderly. It was observed, with this variation, that there is a raise in the use of hearing aids as the age grows.

Key words: hearing loss, elderly, hearing.

INTRODUCTION

The growth of the amount of people aged over 60 is a worldwide issue. According to IBGE (*Instituto Brasileiro de Geografia e Pesquisa*—Brazilian Institute of Research and Geography), such growth is reaching levels with no precedent facts. In 1950, there used to be 204 million elderly people. In 1998 that number reached 579 million (8 million per year). In Brazil there are 15 million elderly people and in Belém they count for 864 thousand out of 1795 million of population in the state.

Researches have been pointing that, in 2050, the elderly population will sum 1900 million of people, which is the same number as the young population aging between 0 and 14 (1).

Data from researches show that Brazilian population is getting old as well as the world one. That can be due to a gradual increase of the average life expectancy from a possible technological advance, moreover the raise of level of life of population, even far from the ideal condition of good medical assistance, sanitation, hygiene, etc., especially in developing countries, such as Brazil, so to speak.

Aging is a dynamic and progressive process, in which there are morphological, functional, biochemical and psychological alterations. They determine the ability loss of people's adaptation to the environment, by causing vulnerability and pathological process occurrences, which can be deathly (2).

In general terms, nowadays, the elderly is taken as incapable, with no social role, by affecting productivity processes, in which it is based, as the young is seen as "better" in the social activities. So, the elderly people become frustrated for being left apart, and this cause social and communication isolation, what is responsible for keeping active social acquaintance.

The elderly naturally raises some limitations which lead to a vital and basic function decay, such as hearing and sight acuity, tactile system, pain increase, etc., though this does not mean the elderly is ill. They can keep physical and mental activities according to their abilities, which provide a good quality of life.

Other aspects on process of psychological aging, which limit the elderly to perform their role in society, are: perception, motivation changes, self-esteem loss, immediate memory fails and so forth. Those aspects can trouble those individuals' life as well as life of those who surround them.

"Understanding aging is to notice that the elderly is constantly adjusting mechanisms and strategies, aiming to surpass their decaying abilities in order to keep personal and social emotional balance." (3).

Complaint Characterization

Some authors report: the better people's adaptation to life at youth the better it will be their adaptation when aging. The elderly who had better condition of adaptation (in personality terms) did not present with emotional problems. The ability to suit to aging is the most important psychological aspects when aging. Tough, become older is a challenge to the contemporary human (3).

With all these challenges, the elderly has even to face the difficulty to communicate themselves, due to their hearing loss process as it is an aging effect, and this also affects family and friends relationship.

Such hearing sensitiveness or physiological hearing impairment by aging is known as presbycusis, which is caused mainly by: industry noise, food habits, medication use, everyday tension and genetic predisposition. The other members of the family often describe the elderly with hearing loss as a confused, disoriented, non-communicative, mean, and simply or unfairly old person. (4).

Presbycusis was defined as: "*a disorder in the hearing preliminary sensitiveness, on temporal, sound frequency, hearing judging, speech recognition systems, associated to a decrease on high frequency limits and to a decrease on intelligibility of deformed speech and to the ability of long sentence remembrance*" (3).

The current retrospective study aims to describe complaint occurrences, type of hearing loss and therapy on individuals assisted at a private medical clinic in Belém—PA – Brazil, from 2000 to 2005, having gender and age as variable sources.

METHOD

This study was analyzed and approved by the Ethics Committee of *CEDIAU* according to the suggested rules for experiments in humans, in order to achieve the ethic principle on researches.

From that point, a letter of authorization was sent to one of the owners of the clinic, requesting data from the medical files of the patients.

The material consisted of 163 out of 256 medical

files. From those 137 were female and 26 male, aging from 60 to 89 years. The 163 ones were selected based on complaints, type of hearing loss and therapy.

Patients were classified according to gender and age in three different groups: group 1: the ones aging from 60 to 69 years; group 2 from 70 to 79 years, and group 3 from 80 to 89 year. The average age was 68 years.

The following topics were analyzed:

- otological history to analyze complaints;
- audiological evaluation to analyze audiometric outcomes, which were classified regarding type of hearing loss according to SANTOS RUSSO (1993).
- Therapy, analyzes through medication or hearing aid sound amplifier use.

All exams were performed by the same Professional in an acoustically designed booth, according to the standard ANSI S3. 1-1991, including the following procedures:

- Preliminary Tonal Audiometry: performed with Diagnostic AudioMeter, Model AD 28, according to the standard ISO 8253-1, 1989, following the criteria by Santos, Russo 1993).

Criteria for result analysis

- Gender: male and female
- Age: G1, G2 and G3
- Type of hearing loss:
 - Conductive
 - Sensorineural
 - Mixed
- Therapy:
 - Clinical (medicine use)
 - Hearing aid recommendation

Statistical Methods

Data from this study were sent to statistical therapy, and variables such as gender, age and therapy were analyzed.

The level of significance was classified as 0.05 (5%), which counted for 95% of statistical trust. The equality test of the two rates was used when comparing levels of responses to the study variables: gender and age, by starting from complaints followed by type of hearing loss and therapy. Statistical VaR Estimation is variation index regarding average, i.e. the amplitude to build trust gap or margin of error of the proportion found in the sample.

RESULTS

In order to make analysis easy, all the results of this research will displayed in Tables and Charts according to the variables: gender, age and type of hearing loss as mentioned.

Hearing complaints

Tables 1 and 2 display the analysis regarding hearing complaints.

Type of Hearing loss

Charts 1 and 2 display the analysis regarding hearing losses.

Therapy

Charts 3 and 4 display the analysis regarding therapy.

DISCUSSION

The current retrospective study aims to describe complaint occurrences, type of hearing loss and therapy on individuals assisted at a private medical clinic in Belém – PA – Brazil, from 2000 to 2005, having gender and age as variable sources. It was necessary to research a theoretical base in order to focus aging and the problems involved on it. The current discussion of the results will follow the same sequence of their presentation: hearing complaints, type of hearing loss and therapy.

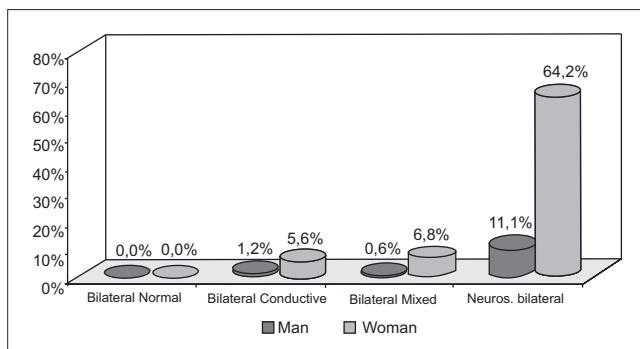
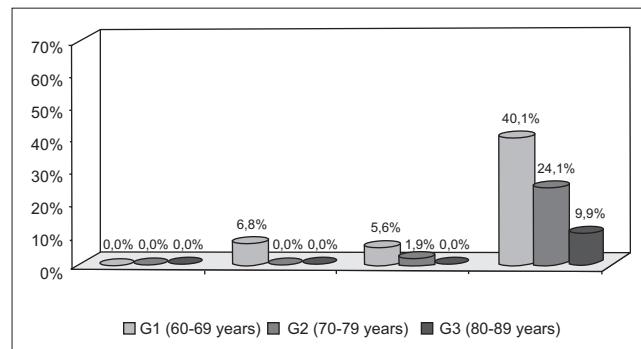
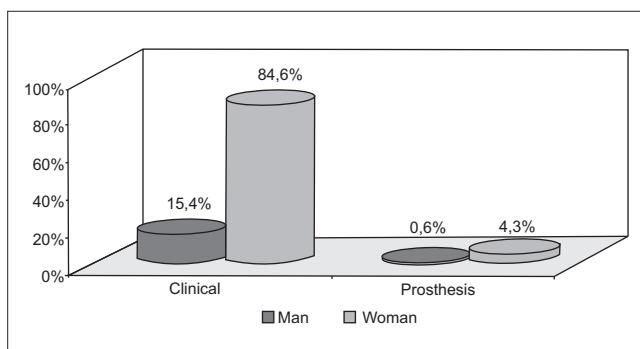
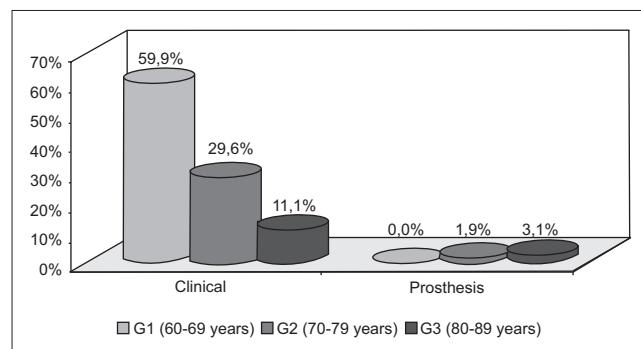
Hearing complaints

In the current study, it was reported a predominance in women in a significant statistical difference, especially in patients at their 70s. These data agree with the ones in the literature (7-8,13-14,19).

According to IBGE (2000) (20), there are more women than men in Brazilian population, so more elderly women (55.4%). This fact is due to the difference of life expectancy between genders and also to the social changed along the years. These findings are similar to the ones by GUSHIKEM (5), in a woman elderly population majority (67.6%) and also in vestibulopathy patients under ambulatory follow-up by EBEL (6) (68.3%). Regarding age, it was found a relatively young population, where 59.4% of patients were under their 70 and, and the average age was 68 years.

Table 1. Average and variation rate in relation to the average of different types of complaints by individuals, regarding gender.

Complaints	Female			Male			p-value
	Quantity	%	Variance	Quantity	%	Variance	
Unbalance	10	6,2%	3,7%	0	0,0%	0,0%	0,001*
Dizziness	43	26,5%	6,8%	5	3,1%	2,7%	<0,001*
Headache	29	17,9%	5,9%	0	0,0%	0,0%	<0,001*
Tinnitus	46	28,4%	6,9%	5	3,1%	2,7%	<0,001*
Hearing Loss	82	50,6%	7,7%	18	11,1%	4,8%	<0,001*
Autophonia	17	10,5%	4,7%	5	3,1%	2,7%	0,008*
Ear pain	37	22,8%	6,5%	4	2,5%	2,4%	<0,001*
Nauseas	14	8,6%	4,3%	3	1,9%	2,1%	<0,006*
Itching	19	11,7%	5,0%	3	1,9%	2,1%	<0,001*
Ototorrea	7	4,3%	3,1%	1	0,6%	1,2%	0,032*
Ear fullness	9	5,6%	3,5%	4	2,5%	2,4%	0,157
Hear but do not understand	26	16,0%	5,7%	7	4,3%	3,1%	<0,001*

**Graphic 1.** Average of different types of hearing loss divided according to gender.**Graphic 2.** Average of different types of hearing loss divided according to age.**Graphic 3.** Average of different therapies - divided according to gender.**Graphic 4.** Average of different therapies - divided according to age.

In Tables 1 and 2, regarding hearing complaints, hearing loss was the most common one, which was reported by 100 elderly patients (61.7%), followed by tinnitus (31.5%), dizziness (29.6%), ear pain (25.3%), the ones who hear but do not understand (20.3%), headache (17.9%), itching and autophonia (13.6%), nausea (10.5%),

ear fullness (8.1%) and imbalance (6.2%). Significant statistical difference was found regarding females for such complaints. Regarding hearing loss complaints (38.3%), tinnitus and ear pain (20.4%), itching and autophonia (4.6%), the 60-to-69-year-old group did not report proportional difference with higher figures than the ones found in the 70-to-79-year-old

Table 2. Average and variation rate in relation to the average of different types of complaints by individuals, divided according to age group.

Complaints	G1 (60-69 anos)			G2 (70-79 anos)			G3 (80-89 anos)		
	Quantity	%	Variance	Quantity	%	Variance	Quantity	%	Variance
Unbalance	5	3,1%	2,7%	3	1,9%	2,1%	2	1,2%	1,7%
Dizziness	25	15,4%	5,6%	16	9,9%	4,6%	7	4,3%	3,1%
Headache	16	9,8%	4,6%	10	6,2%	3,7%	3	1,99%	2,1%
Tinnitus	33	20,4%	6,2%	9	5,6%	3,5%	9	5,6%	3,5%
Hearing Loss	62	38,3%	7,5%	22	13,6%	5,3%	16	9,9%	4,6%
Autophonia	16	9,9%	4,6%	5	3,1%	2,7%	1	0,6%	1,2%
Ear pain	33	20,4%	6,2%	6	3,7%	2,9%	2	1,2%	1,7%
Nauseas	8	4,9%	3,3%	8	4,9%	3,3%	1	0,6%	1,2%
Itching	16	9,9%	4,6%	5	3,1%	2,7%	1	0,6%	1,2%
Otorrhea	7	4,3%	3,1%	1	0,8%	1,2%	0	0,0%	0,0%
Ear fullness	7	4,3%	3,1%	5	3,1%	2,7%	1	0,6%	1,2%
Hear but do not understand	13	8,0%	4,2%	17	10,5%	4,7%	3	1,9%	2,1%
Complaints	G1	G2							
Unbalance	G2	0,474							
	G3	0,252	0,652						
Dizziness	G2	0,133							
	G3	<0,001*	0,052#						
Headache	G2	0,220							
	G3	0,002*	0,048*						
Tinnitus	G2	<0,001*							
	G3	<0,001*	1,000						
Hearing Loss	G2	<0,001*							
	G3	<0,001*	0,300						
Autophonia	G2	0,013*							
	G3	<0,001*	0,099#						
Ear pain	G2	<0,001*							
	G3	<0,001*	0,152						
Nauseas	G2	1,000							
	G3	0,018*	0,018*						
Itching	G2	0,013*	0,018*						
	G3	<0,001*	0,099#						
Otorrhea	G2	0,032*							
	G3	0,007*	0,317						
Earfullness	G2	0,556							
	G3	0,032*	0,099#						
Hear but do not	G2	0,443							
Understand	G3	0,010*	0,001*						

p-value

group, which were superior to the 80-to-89-year-old group. Regarding dizziness (15.4%), headache (9.9%), *hear but no understanding* (8.0%) and ear fullness (4.3%), the 60-to-69-year-old group reported significant statistical difference when compared to the 80-to-89-year-old group.

Such data point that hearing loss was the most common complaint. Age-related hearing loss is known as presbyacusis, which is defined as a progressive bilateral symmetrical sensorineural hearing loss. Some studies report prevalence of 63% of hearing impairment in elderly people according to gender and age. Russo (4) reported

that the elderly with presbyacusis went through a reduction of hearing sensitiveness and of speech understanding, which affect any person's communication process. Hearing loss in high frequencies damages vowel perception, mainly when in noisy environment. Mis-answers from the elderly population often sound aging problems, which might not be true. The real complaint is no hearing and not misunderstanding.

Results presented tinnitus in large frequencies. Tinnitus was defined (in 1982) as perception of a sound in the ears or head. It is believed to be an abnormal neural

activity in the hearing pathways, and it is associated to otological, methabolical, neural, cardiovascular, pharmacological, dental and psychological causes and even among themselves. Many hypotheses have been suggesting a sensorineural origin, but none has been proved. However, there are several explanations for its origin such as external and internal ciliated cell damages regarding proportion process; alterations of homeostasis of calcium on cochlear dysfunction; cross-talk between the 8th pair of fibers and the ciliated cell; hyperactivity of the central hearing loss and spontaneous otoacoustic emission. Tinnitus is mild and discontinuous in 80% of the cases, and does not affect the individual's life. On the other hand, if developed in higher levels it can affect sleeping process, concentration, emotional balance and even social life, preventing everyday activities. GUSHIKEM (5), CAOVILLA (7), GANANÇA (8) examined 34 patients aging between 60 and 92 year. 23 were female and 11 were male, who presented with or without rotatory dizziness condition. And came to a conclusion that tinnitus was their main complaint. EBEL (6) and HULL (9) and col. researched the prevalence of symptoms in 1927 women and 1140 men aging over 65 years. Tinnitus and dizziness were reported as the main symptoms. Regarding tinnitus, 23.1% and 22.3% were reported by women and men respectively, and regarding dizziness 13.9% and 10.5% were reported in the same way. Dizziness complaint raised by aging in men, and women reported such complaint by making more use of medication.

Still, dizziness is the main complaint in the current study and also by women. These data agree with other studies. CAOVILLA and col. (7) and Ganança and col. (10) report dizziness as affecting more women in a 2:1 ratio. CAOVILLA (7) when analyzing 1000 patients reported 625 female cases and 375 male ones. GANANÇA (10) reported vertigo and other types of dizziness in 4812 (61.3%) women and in 3038 (38.7%) men, who were examined from January 1986 to June 2000. It is known that dizziness affects more the elderly population who tends to present with affected body balance. Natural aging alterations regarding body balance, chronic-degenerative diseases, use of medication, etc. can favor dizziness symptoms or even make it worse, by causing physical, functional and emotional limitations for this population.

Body balance is the integration of vestibular, visual and proprioceptive systems, under the cerebellum management. When information from these systems is in disagreement, which it not supposed to be, there it happens a body balance process. Dizziness and vertigo are the main complaints of such disorder. The former is the alteration feeling on the non-rotatory body balance system, the latter refers to rotatory dizziness, when patient either their body or the surrounding objects are spinning around.

According to GANANÇA and CAOVILLA (11), vertigo is mentioned in the literature for several reasons. It affects from 5 to 10% of the world population; it is the seventh and fourth complaint in the rank by women and men respectively, being the second reported symptom on people aging up to 65 and the most common after that age; it affect 47% of men and 61% of women aging over 70; it is the most common complaint of people over 75; 65% of the individuals at their 60s or more, 50 to 60% of the active elderly or 81 to 91% of the elderly assisted in ambulatories present with it.

Data show figure decrease of hearing loss in relation to aging process. This might be due to prevalence of people aging over 80 be reduced because of the small number of these patients. Other authors also reported those data. GANANÇA (10) reported patient aging between 0 and 95 years, in the 7850-case study. Occurrences presented higher rate between the ages of 31 and 75 (72.25%) and lower one between the ages of 70 and 75 (9.48%). CAOVILLA and col. (7), when analyzing patients from 5 months and the ones over 81 years old, reported that dizziness occurred less frequently in 5-to-20-year-old patients (6.2%), affecting mainly the ones from 21 to 80 years old, 32.3% between 21 and 40 years; 34.7% between 41 and 60 years; 24.6% between 61 to 80 years.

The current authors believe that this finding is also expected by the self-isolation of the elderly by either the own disorder or income reduction, which makes the medication purchase and access to medical assistance difficult. Aging cost is high, though health problems are chronic most of times, and when they arise they can last for long and then leading to disabilities. Although the elderly situation is not the same in the country, by reflecting different social, economical, cultural and education conditions, demographic data show that, in general, Brazilian elderly is poor and lacks public health assistance. In the industrial and urbanized society there is no investment on health life care for the elderly, which leads them to communication problems among others (1,4,13,15,15,16). MORRISON (17) reported that presbyacusis is an universal problem for all who reaches old age, although some do not complain of it. Sometimes, hearing tests presents high level of hearing loss in the elderly who is able to keep good conversation even on the phone. The slow advance of hearing loss presbyacusis process allows a type of compensatory adaptation similar to hearing training.

Type of Hearing Loss

Regarding influence of the variable gender on the type of hearing loss, it was found bilateral sensorineuronal

loss in 64.2% of the women, mixed type in 6.8% and bilateral conductive one in 5.6%. It was already mentioned that presbyacusis is a progressive bilateral age-related hearing loss. Its origins can be: age, metabolic and vascular disorders, kidney disease, medication use, medical therapy and noise exposure, and for women it is added Menière's disease and hearing loss family history (18). The outcomes of the current research show a percentage of 64.2% of women and 11.1% of men who presented hearing loss. This information is not related to hearing loss origins, but by the search of assistance by women. According to VERAS (16), life expectancy is higher in women, what can be due to biological aspects and different exposures to risky and mortality factors. He also assured that the economical aspect which has been placing women in the business marketing has also taking them from home, what means there is nobody to look after the elderly in case of any physical problems. However, due to life expectancy being longer for women, they are longer exposed to chronic degenerative diseases and widowhood. Yet, the current findings do not agree with some other studies (4,13,15,16,18,19) when regarding gender-related hearing threshold as they report that men are more affected than women maybe due to more constant exposure to risky factors such as noise exposure, arteriosclerosis, smoking habits and others. Such disagreement shows that nowadays both men and women are exposed to the same risky factors. On the other hand, BILTON (20), EBEL *et al.* (6) did not report any difference on hearing threshold between the two genders.

Only 5.6% of the current study population present with bilateral conductive hearing loss and 6.8% with bilateral mixed loss. Such difference is not surprising as a great amount of problems in the middle ear was expected. Our findings agree with GRECO's (21), regarding types of hearing loss in the elderly. Sensorineural hearing loss prevails and a small percentage of people present conductive and mixed types. WILLOT (18) when reporting possible alteration in the elderly's middle ear such as mechanical integrity loss of ossicular chain, arteriosclerosis and middle otitis, affirmed that hearing problems of the middle ear are not so relevant when studying hearing loss in the elderly.

Statistic Researches show that presbyacusis affect around 25% of the Americans aging between 65 and 74 years and 38% of the ones over that age. VIÚDE (22) presented a study where 14 male and 71 female patients aging from 61 to 89 were evaluated. It aimed to study the prevalence of presbyacusis as well as identify its associated factors in elderly people. It followed that presbyacusis affected 71.8% of the elderly, and 89% of the ones aging over 89 years. That study reported a 40.1% prevalence of bilateral sensorineural hearing loss

on 60-to-69-year-old patients, followed by 24.1% on patients aging from 70 to 79 years and only 9.9% on those aging from 80 to 89. It was no found any explanation for those data in the literature. This disagreement could be related to the percentage of the 59.4% of individuals evaluated who aged less than 70 year with an average of 69 years old).

Therapy

There was a significant statistical prevalence for females on both therapies: clinical one (84.6%) and hearing aid recommendation (4.3%). For patients aging 60-69 years (59.9%), only clinical therapy was recommended. For the 70-to-79-year-old group, clinical therapy (29.6%) prevailed in relation to hearing aid 3 (1.9%). The 80-to-89-year-old group presented an increase on clinical therapy (11.1%) when compared with hearing aid 5 (3.1%), though for this group hearing aid recommendation was higher. It was noticed that there is a progressive increase on hearing aid use according to aging. Although this increase is not so expressive, it can be a result of predicting aging in order to reduce communication difficulties. Hearing loss is one of the most destructive sensorineural disorders which affects communication and causing damages on emotional, social and professional aspects of life. Hearing loss degeneration is a sign of aging (3).

The results show that only 5% of the individuals consented to wear hearing aid. Russo (4) studied a group of elderly people with presbyacusis and applicants for hearing aid use, by analyzing their behavior and arguments towards such use. The responses were lack of need, financial problems, difficulty how to operating it, vanity and noise. In that way, it is important to perform a program of hearing rehabilitation in order to help reducing psychosocial reactions from hearing impairment, as it helps communication as well as how to make a good use of such aid. Russo (4), when studying possible reasons for not accepting the use of hearing aids by the elderly, reported that psychosocial aspects can result in negative behavior more than the acoustic problems themselves. The author also mentioned that the status decay of the elderly within family and society leads them to isolation by preventing them from communicate and information sources as well as causing a great impact in life.

CONCLUSION

With all these audiological findings, such as complaints, type of hearing loss and therapy from the 163 medical files, it follows that:

1. Regarding hearing complaints:

- hearing loss was the most common one, reported by 100 elderly (61.7%), followed by tinnitus (31.5%), dizziness (29.6%), ear pain (25.3%), headache (17.9%), hearing but not understanding (20.3%), itching and autophonia (13.6%), nausea (10.5%), ear fullness (8.1%) and imbalance (6.2%). There was a significant statistical difference regarding women complaints. The 60-to-69-year-old group did not present higher numbers than the other groups.

2. Regarding type of hearing loss

- Although sensorineural hearing loss was not the only type found in the elderly population, it was the most common (64.2%). The percentages of mixed and conductive types were 6.8% and 5.6% respectively.

3. Regarding therapy

- There was a significant statistical prevalence for females on both therapies: clinical therapy (84.6%) and hearing aid recommendation (4.3%). For patients aging 60-69 years (59.9%), only clinical therapy was recommended. For the 70-to-79-year-old group, clinical therapy (29.6%) prevailed in relation to hearing aid 3 (1.9%). The 80-to-89-year-old group presented clinical therapy (11.1%) and recommendation for hearing aid 5 (3.1%). It was noticed that there is a progressive increase on hearing aid use according to aging.

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