BENEFIT PROVIDED BY THE USE OF INDIVIDUAL AMPLIFICATION DEVICE IN THE ELDERLY FROM A HEARING HEALTH PROGRAM IN PORTO VELHO-RO

Benefício fornecido pelo uso de aparelhos de amplificação

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ABSTRACT

Purpose: to verify the benefit of an individual sound amplification device in the elderly people from Porto Velho, Rondônia and surrounding area, also comparing the results to the degree of hearing loss installed in this population. **Method:** 18 elderly people aged from 60 to 82 years old were part of this study. They suffer from mild to moderately severe sensorineural hearing loss. The benefit was evaluated by the Abbreviated Profile of Hearing Aid Benefit – APHAB questionnaire under conditions of with and without hearing aids which was applied at the moment of adaptation and three months later. For analysis of the responses were considered the following subscales: Ease of communication, environmental noise, reverberant noise and sound aversion. The provided benefit was evaluated according to the degree of hearing loss by each subject. **Results:** it was verified benefit in the subscales: ease of communication, environmental noise and reverberant noise, and these results demonstrated a statistically significant difference. With regard to the relation between the benefit to the degree of loss, it was found, among subjects with symmetrical hearing loss, greater benefit in those ones with sensorineural moderate hearing loss. However, it was not possible to verify the relation between the degree of loss and the provided benefit among individuals with different degrees of hearing loss. **Conclusion:** there was a reduction of hearing difficulties through the use of sound amplification in favorable environments, as well as in reverberant and high noise level ones.

KEYWORDS: Presbycusis; Hearing Aids; Questionnaires; Elderly People; Adaptation

INTRODUCTION

Hearing is an essential sense to life, playing an important role in society; it is the basis of the development of human communication. An individual with a hearing disability may suffer serious damage in his social, psychological and professional life, coming to feelings of insecurity, fear, depression, isolation and tension in the family environment, due to the lack of attention to the hearing impaired person[1].

Aging is a stage of life in which the individual presents physical, sensory, intellectual and emotional modifications. This sum of factors makes the elderly require customized services according to the configuration of their complaints[2].

Hearing loss due to aging is called presbycusis and is defined as a progressive loss of hearing sensitivity due to aging[3].

One way to lessen the impact of hearing loss on an individual's life is the use of hearing devices (individual hearing aids – HA). Thus all

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environmental sounds and speech will be amplified, besides danger signs and warning, which will allow the individual to have a better quality of life and better psychosocial and intellectual conditions[4].

Even with technological advances occurring in amplification systems, user satisfaction remains a challenge for audiologists and the high incidence of abandonment of hearing aids is a serious problem for health services[5]. The process of selection and fitting of hearing aids will only be effective and have good results if the individual makes an effective use of this device. For this it is necessary that the user is satisfied with the gotten results.

A method to evaluate the satisfaction and benefit of the user in relation to the use of hearing aids are the self-assessment questionnaires. In Brazil, some self-assessment questionnaires were translated and adapted to the reality of the country, investigating the degree of user satisfaction and the benefits gained from the reduction in hearing loss resulting from the use of these devices[6,7].

These instruments intend to investigate the performance of the individual and the perception of the changes that may occur over time, either in hearing itself, favorable or not, during social and emotional which is extremely important, as by using self-assessment questionnaires on disability or hearing handicap we can obtain subjective measures of benefit based on the judgment or in the user's own perception[8].

In Porto Velho/RO, the diagnosis and intervention through the provision of hearing aids are made by the Clinical Threshold, which is contracted to the Unified Health System (Sistema Único de Saúde – SUS) by decree 589 from 8 October 2004. This clinic serves both the population of Porto Velho and patients who come from other towns in Rondônia and neighboring states and carries about 35 adaptations per month, half of these being performed in the elderly.

Hence, there is the importance of evaluating the benefit of using hearing aids in the elderly population of Porto Velho/RO and region through the application of self-assessment questionnaires.

Therefore, this study aimed to verify the benefit in the elderly population of Porto Velho and region, who was aided in the period from December 2010 to February 2011, and to compare the findings with the degree of hearing loss installed in the studied population.

METHOD

This is a longitudinal, exploratory, non-experimental study on the clinical assessment and rehabilitation of hearing threshold in Porto Velho, RO.

Initially it was delivered to the head of the clinic an official letter requesting authorization to collect data at its dependencies, which is considered a referral clinic in the state of Rondônia in caring for patients with hearing loss. The Threshold clinic is a private clinic contracted to SUS that meets the high demand of patients with hearing loss who seek care related to auditory rehabilitation through the process of selecting and adaptation of hearing aids.

Inclusion criteria for the composition of the sample were: subjects aged from 60 to 90 years old with bilateral sensorineural hearing loss from mild to moderately severe, who were in the process of hearing aid adaptation and consented to participate in the study and signed the Term of Free and Informed Consent having been informed about the purpose and methodology of the proposed study. Thus, were excluded from the study subjects aged under 60 years old and above 90 years old, individuals with unilateral hearing loss, subjects with bilateral sensorineural hearing loss, severe and profound individuals who were not under the hearing aid adaptation and subjects who did not sign the consent form.

The research began with 20 elderly, but two were excluded from the sample for failing to follow the steps of the research because they did not live in the city where the study was developed.

Thus, 18 subjects participated in the study, aged from 60 to 82 years old, who fitted the inclusion criteria.

From the 18 subjects who participated in this study, 12 (66.7%) were male and six (33.3%) were female. Subject ages ranged from 60 to 82 years old, eight (44.4%) were aged from 60 and 69 years old, seven (38.88%) from 70 to 79 years old and three (16.66%) from 80 to 82 years old.

Regarding location, nine (50%) were from Porto Velho and nine (50%) from other cities in the state of Rondônia.

Using the Lloyd & Kaplan classification (1978), three out of the 18 subjects had mild bilateral hearing loss; five had moderate bilateral hearing loss and three moderately severe bilateral hearing loss. The remaining subjects had different degrees of hearing loss in both ears.

All subjects in the sample were bilaterally adapted with digital hearing aid technology, being 13 from A line, two from B line and three from C line.

The benefit to the elderly with the use of hearing aids was evaluated by applying the self-assessment questionnaire Abbreviated Profile of Hearing Aid Benefit – APHAB – Cox and Alexander (1995) and adapted to the Portuguese in 1998 (Figure 1).

PROTOCOL

Name: _____
Age: _____
Address: _____
Telephone: _____ – _____
Date: ____/____/____
Type and degree of hearing loss: _____

INSTRUCTIONS: Please circle the answer which most closely matches your everyday. Note that each choice includes a percentage.
You can use it to decide your answers. For example, if an item is true about 75% of the time circle letter C. If you have not experienced the situation, try to think of a situation similar to this. If you have no idea, leave it blank. A always (99%) B almost always (87%) C usually (75%) D half the time (50%) and sometimes (25%) F rarely (12%) G Never (1%).

	Without the prosthesis	With the prosthesis
1. When I'm at the supermarket, talking to the cashier, I can follow the conversation.	**A B C D E F G**	**A B C D E F G**
2. I lose information when I'm in a class, course or lecture.	**A B C D E F G**	**A B C D E F G**
3. Unexpected sounds like a car alarm are uncomfortable.	**A B C D E F G**	**A B C D E F G**
4. I have difficulty listening to a conversation with one of my family members at home.	**A B C D E F G**	**A B C D E F G**
5. I have trouble understanding dialogue in film or theater.	**A B C D E F G**	**A B C D E F G**
6. When I am listening to the news in the car radio and the family members are speaking, I have trouble understanding the news.	**A B C D E F G**	**A B C D E F G**
7. When I'm at a dinner table with several people and I'm trying to talk to one of them, it is difficult to understand the speech.	**A B C D E F G**	**A B C D E F G**
8. The sounds of traffic are very intense.	**A B C D E F G**	**A B C D E F G**
9. When I'm talking to someone in a large empty room, I understand the words.	**A B C D E F G**	**A B C D E F G**
10. When I'm in a small room, asking or answering questions, I have trouble following the conversation.	**A B C D E F G**	**A B C D E F G**
11. When I'm in a theater or movies watching a movie or play people around me are whispering.	**A B C D E F G**	**A B C D E F G**
12. When I'm talking quietly with a friend I have trouble understanding.	**A B C D E F G**	**A B C D E F G**
13. The sounds of running water, such as in the kitchen sink, in the bathroom or shower are uncomfortably intense.	**A B C D E F G**	**A B C D E F G**
14. When a speaker is addressing a small group and everyone is listening silently, I have to strive to understand.	**A B C D E F G**	**A B C D E F G**
15. When I'm talking to my doctor in the exam room, it is difficult to follow the conversation.	**A B C D E F G**	**A B C D E F G**
16. I can understand the conversation even when several people are talking at the same time	**A B C D E F G**	**A B C D E F G**
17. The sounds of construction are uncomfortably loud.	**A B C D E F G**	**A B C D E F G**
18. It's hard for me to understand what is said in lectures or in churches.	**A B C D E F G**	**A B C D E F G**
19. I can communicate with others when I'm in the crowd.	**A B C D E F G**	**A B C D E F G**
20. The sound of a close by siren is so intense that I need to cover my ears.	**A B C D E F G**	**A B C D E F G**
21. I can follow the words of a sermon at a Mass or worship service.	**A B D E F G**	**A B C D E F G**

22. The sound of a car break is uncomfortably intense.	A B C D E F G	A B C D E F G
23. When talking to another person in a quiet environment, I need to ask her to repeat what was said.	A B C D E F G	A B C D E F G
24. I have trouble understanding what others say when the air conditioner or fan is on.	A B C D E F G	A B C D E F G

(Adapted by ALMEIDA, GORDO, IÓRIO and SCHARLACH, 1997).

Figure 1 – ABBREVIATED PROFILE OF HEARING AID BENEFIT – APHAB – Protocolo de Avaliação do Benefício das Próteses Auditivas

The completion of the questionnaire was done with the help of the researchers who, in an impartial manner, read the questions and made sure that the participants were watching and understanding what was being asked, and how it was to be held marking the answers, thus ensuring the quality of the obtained data.

The questionnaire was administered on two occasions, in hearing aid adaptation and three months thereafter. This waiting period is justified by the possibility of the use of hearing aids, from the reintroduction of auditory stimulation, favoring a "new" plasticity of the auditory system, improving the ability of speech recognition (acclimatization)[9], and such improvement may occur within three months after the hearing aid fitting[10,11], six to twelve weeks after the amplification[12] and according to some authors from the first month of adaptation[13].

The questionnaire consists of 24 questions, divided into four subscales, which are: ease of communication at environments (EC); communication in the presence of environmental noise (EN); communication in reverberant noise environments (RN); discomfort/aversion to environmental sounds (AS).

The subjects were instructed to indicate how often the proposed situation occurs, and then mark in a list of the seven alternatives: A. always (99%), B. almost always (87%), C usually (75%), D. half the time (50%), E. sometimes (25%), F. rarely (12%) and G. Never (1%). Each alternative was presented in a descriptive way associated to the percentage to assist in the interpretation of the alternatives for the individual. To collect these data, printed questionnaires were used.

For the analysis of the results obtained, we considered each subscale individually, being necessary to place a minimum difference of 22% between the rates with and without hearing aids in at least one of the subscales – EC, EN or RN – to represent a real difference between two conditions. For the global evaluation of amplification, so that one could conclude that the HA improved hearing performance of the elderly, it was required a rate 10% better with hearing aids than without this device at the EC, EN and RN subscales[14].

For the statistical analysis of the findings by subscales, the responses obtained from the questionnaire were entered into the software developed by Argosy and made available by the clinic which quantified the threshold values for the four subscales according to each individual, and the findings were subjected to statistical tests.

In addition, the data collected from the questionnaire on the day of the hearing and three months after it were tabulated in Excel spreadsheet and also sent to statistical analysis in order to verify the significance of results obtained according to each question questionnaire.

This study was reviewed and approved by the Ethics Committee in Research from São Lucas College under No. 546/10.

The collected data were subjected to the following statistical tests: Mann-Whitney test and Wilcoxon test, both with the level of significance of 5%. To compare the findings in conditions with and without hearing aids in the four subscales the Mann-Whitney test was applied and for the analysis of the questions of EC, EN and RN subscales, alone, under the conditions with and without hearing aids the Wilcoxon test was applied.

To analyze the benefit according to the degree of hearing loss was not possible due to the use statistical tests since there is no possibility of comparing two variables of the same subject using these tests. Therefore, we performed a descriptive analysis only from the comparison in subjective benefit of each subject, generated by Argosy software, with the degree of hearing loss, as shown in Table 4.

RESULTS

By performing an individual analysis of the findings by subscale, at the time of adaptation (without HA) and three months after it (with hearing aid), it was found that 88% of the elderly (n = 16) showed a minimal difference of 22%, between the two situations, at least one of the three subscales

(EC, EN and RN) being the EC subscale found in equal or higher value than 66.6% in this sample, and 55.5% in the RN subscale and 22.2% in the EN subscale. These results find that many elderly people obtained benefit with the adaptation of hearing aids (Table 1).

But in the overall amplification, which requires an equal or greater value than 10% under the conditions with and without hearing aids in the three subscales above it was found that eight subjects reached the recommended, but seven people reached the required value in two subscales and one individual had benefit in only one subscale, being that two individuals did not achieve the required value in any of the subscales (Table 1).

However, the overall assessment of amplification, which requires a benefit equal to or greater than 10% in subscales EC, EN and RN, found that eight subjects achieved the recommendations. However, seven out of the ten elderly who did not reach the required value obtained the recommended in two subscales (Table 1).

From the statistical analysis of these data there was no difference between the situations with and without hearing aids, EC, EN and RN subscales, suggesting the presence of benefit with the use of hearing aids. No significant difference was found for the AS subscale (Table 2).

Furthermore, by separately examining the questions, it was found that the subscale which showed benefit ($p \leq 0.05$) in more questions (five out of six questions) was EC, followed by EN subscale (four out of six questions) and RN subscale (six out of three questions), and none of the questions regarding AS subscale showed benefit (Table 3).

By analyzing the benefit according to the degree of hearing loss, it was found that among the elderly with symmetrical hearing loss, two with mild sensorineural hearing loss, four with moderate sensorineural hearing loss and two with moderately severe sensorineural hearing loss showed benefit (Table 4).

Two individuals did not show any benefit, one with mild sensorineural hearing loss and another with moderate sensorineural hearing loss, both bilateral (Table 4).

Among the seven subjects with asymmetrical hearing loss, all showed benefit.

Table 1 – Percentage values and benefits obtained with the use of hearing aids in different subscales

Individual	WITHOUT HA				WITH HA				BENEFÍT			
	EC	EN	RN	AS	EC	EN	RN	AS	EC	EN	RN	AS
1	25%	60%	64%	19%	11%	40%	31%	1%	14%	20%	33%	18%
2	23%	70%	60%	1%	12%	56%	31%	1%	11%	14%	29%	0%
3	74%	66%	62%	1%	27%	58%	33%	1%	47%	8%	29%	0%
4	56%	78%	37%	1%	56%	78%	37%	1%	0%	0%	0%	0%
5	64%	80%	64%	17%	2%	13%	19%	1%	62%	67%	45%	16%
6	21%	52%	21%	1%	1%	39%	17%	17%	48%	33%	66%	1%
7	48%	33%	66%	1%	10%	41%	45%	1%	38%	-8%	21%	0%
8	68%	41%	62%	1%	35%	34%	37%	1%	33%	7%	25%	0%
9	76%	62%	37%	48%	43%	44%	33%	15%	33%	18%	4%	33%
10	41%	19%	29%	1%	48%	-1%	29%	0%	7%	-1%	0%	0%
11	25%	29%	37%	1%	1%	1%	48%	1%	24%	28%	-1%	0%
12	35%	62%	50%	33%	8%	52%	21%	1%	27%	10%	29%	32%
13	25%	44%	50%	1%	4%	15%	17%	1%	21%	29%	33%	0%
14	66%	50%	50%	17%	12%	50%	41%	1%	54%	0%	9%	16%
15	31%	82%	66%	17%	4%	55%	27%	17%	22%	14%	33%	35%
16	35%	41%	50%	1%	4%	29%	25%	1%	31%	12%	25%	0%
17	33%	74%	33%	1%	9%	54%	33%	1%	24%	20%	0%	0%
18	25%	41%	33%	1%	4%	25%	33%	1%	21%	16%	0%	0%

Legend: HA = hearing aid apparatus, EC = ease of communication; RN = reverberant noise, EN = environmental noise AS = aversion to sounds

Table 2 – Comparison of findings with and without HA subscales EC, RN, EN and AS

	EC		RN		EN		AS	
	Without HA	With HA	Without HA	With HA	Without HA	With HA	Without HA	With HA
Average	42,8%	16,2%	54,7%	37,9%	48,4%	30,9%	9,1%	3,5%
Median	35,0%	9,5%	56,0%	40,5%	50,0%	32,0%	1,0%	1,0%
Standard Deviation	19,4%	17,6%	18,6%	21,1%	14,6%	9,0%	13,6%	5,9%
N	18	18	18	18	18	18	18	18
IC	9,0%	8,1%	8,6%	9,7%	6,7%	4,1%	6,3%	2,7%
P-value	<0,001*		0,023*		<0,001*		0,117	

* Statistically significant values ($p \leq 0.05$) – Mann-Whitney test
Legend: HA = hearing aid apparatus, EC = ease of communication; RN = reverberant noise, EN = environmental noise AS = aversion to sounds

Table 3 – Comparison of conditions with and without HA issues concerning subscales EC, EN and RN

Subscales	Research questions	Without HA	With HA	P-Value
EC	4. I have difficulty listening to a conversation with one of my family members at home.	2,3	4,8	0,001*
	12. When I'm talking quietly with a friend I have trouble understanding.	2,7	5,4	0,007*
	14. When a speaker is addressing a small group and everyone is listening silently, I have to strive to understand.	5,7	6,4	0,066*
	15. When I'm talking to my doctor in the exam room, it is difficult to follow the conversation.	4,2	6,1	0,007*
	23. When talking to another person in a quiet environment, I need to ask her to repeat what was said.	4,2	6,1	0,002*
EN	1. When I'm at the supermarket, talking to the cashier, I can follow the conversation.	2,6	1,9	0,016*
	7. When I'm at a dinner table with several people and I'm trying to talk to one of them, it is difficult to understand the speech.	2,6	4,8	0,001*
	16. I can understand the conversation even when several people are talking at the same time	6,2	5,0	0,012*
	19. I can communicate with others when I'm in the crowd.	6,5	5,4	0,007*
RN	9. When I'm talking to someone in a large empty room, I understand the words.	5,6	4,2	0,011*
	18. It's hard for me to understand what is said in lectures or in churches.	3,5	6,2	0,006*
	21. I can follow the words of a sermon at a Mass or worship service.	4,5	1,5	0,002*

* Statistically significant values ($p \leq 0.05$) – Wilcoxon test
Legend: HA = hearing aid apparatus, EC = ease of communication; EN = environmental noise; RN = reverberant noise

Table 4 – Degree of hearing loss and benefit obtained presented according to each subject

Subject	Degree of hearing loss		Benefit		
	R.E.	L.E.	EC	EN	RN
1	PANM	PANMS	14%	20%	33%
2	PANL	PANMS	11%	14%	29%
3	PANM	PANM	47%	8%	29%
4	PANM	PANM	0%	0%	0%
5	PANM	PANMS	62%	67%	45%
6	PANM	PANM	48%	33%	66%
7	PANMS	PANMS	38%	-8%	21%
8	PANL	PANM	33%	7%	25%
9	PANL	PANM	33%	18%	4%
10	PANL	PANL	7%	-1%	0%
11	PANL	PANL	24%	28%	-1%
12	PANM	PANM	27%	10%	29%
13	PANMS	PANMS	21%	29%	33%
14	PANL	PANL	54%	0%	9%
15	PANL	PANMS	22%	14%	33%
16	PANM	PANM	31%	12%	25%
17	PANL	PANM	24%	20%	0%
18	PANMS	PANMS	21%	16%	0%

Values by subscale obtained by Argosy software.
Legend: RE = right ear, LE = left ear; PANL = perda auditiva neurossensorial leve (mild sensorineural hearing loss); PANM = perda auditiva neurossensorial moderada (moderate sensorineural hearing loss); PANMS = perda auditiva neurossensorial moderadamente severa (moderately severe sensorineural hearing loss), EC = ease of communication; EN = environmental noise; RN = reverberant noise

DISCUSSION

The small number of subjects in the present sample is justified because the inclusion criteria limit the type and degree of hearing loss, and this study included only elderly patients with sensorineural hearing loss from mild to moderately severe. Moreover, the number of adaptations / month in clinical threshold decreases between the months of December and February due to the reduced demand from patients, probably because of the removal of otolaryngologists of their activities due to vacation, and these professionals who are responsible for the indication of the hearing aid being incumbent upon the Speech Language Pathologist the selection and indication of the most appropriate device for each case.

The process of hearing aid adaptation should not be based only on objective measures that assess hearing. Currently, the patient's judgment is taken into account regarding the performance of the device, its acceptance, benefit and satisfaction.

Based on this, it was used in the present study APHAB, as it has some advantages, namely: directs the patient's attention to performance in certain situations, helps the user to develop an analysis of the pros and cons of using amplification, predicts success in adjusting to amplification from the indexes without hearing aid, evaluates the adaptation of this device in general, and to document and quantify the benefit[14].

From the analysis which requires a minimum difference of 22% in at least one of the three subscales (EC, EN and RN) to be considered a benefit[14], it was found that a large majority of elderly patients (n = 16) showed a decrease of the hearing difficulties, a finding that corroborates with findings in a study conducted in a public institution with 25 subjects aged from 13 to 77 years old who were divided into two groups (G1 – with no complaints and G2 – with complaints related to the amplification characteristics) which showed an occurrence of benefit with the use of hearing aids, and found better results in EC subscale in both groups, as observed in the present study[15].

Another finding that agrees with the above was obtained from the statistical analysis of data collected through the application of APHAB at the time of hearing aid adaptation and after three months of using it, which showed a statistically significant difference in the subscales EC, EN and

RN, a finding that is consistent with those obtained in other studies[16,17] in which a statistically significant difference was also found in the subscales mentioned, suggesting a benefit in situations like easy communication in noisy and reverberant environments, one of these studies performed with 42 elderly[18] and the other with 38 subjects from 20 to 80[19].

The results obtained from the analysis of the questions separately reinforces the findings mentioned above indicating greater benefit with the use of hearing aids in situations of conversation in quiet environments, in noisy and reverberant environments three months after the adaptation of the individual hearing aid, the benefit ensures the elderly a better quality of life, due to the amplification of speech sounds as well as environmental sounds.

All mentioned findings indicate that individuals got acclimatized with amplification, i.e., plasticity mechanisms were reintroduced which improved the functioning of the auditory system [9].

However, it was found that in the AS subscale, which quantifies the negative reactions to loud sounds, there was no benefit. It is understood that when the given subscale does not change significantly the value provided with HA when compared to the situation without a hearing aid, the sound amplified by the device is not uncomfortable. This result brings positive information regarding the process of adaptation, as it indicates that the maximum output of the hearing aid is appropriate. This fact justifies the finding in this research that found no significant difference in the AS subscale, a finding that corroborates a study by other authors[17].

Absence of benefit in AS subscale was also found in a survey conducted in São Paulo[18] with subjects adapted for two months, adaptation time similar to the one used in this study. However, we observed a significant reduction of difficulties in the said subscale six months after the adaptation, which may infer that the subjects of this research through a longer lag time could also get the benefit subscale in question.

In assessing the overall benefit, which requires a 10% difference in the conditions with and without HA in the EC, EN and RN subscales, ten patients did not benefit, and seven of these did not reach the percentage required in only one of the three subscales. It is believed that this result could be better with a longer period of adaptation.

It was found that the majority of the sample had sensorineural hearing loss of moderate degree in at least one ear, and hearing loss from mild (n = 8) and moderate-severe (n = 7) showed in a smaller proportion agreeing partly with that obtained in another study[19] in which a moderate hearing loss accounted for most of the sample (56.7%), but the mild hearing losses appeared in large proportion (43.3%), differing in this study.

It was found among subjects with symmetrical hearing loss, a greater benefit in those with sensorineural hearing loss of moderate degree. Researchers[20] claim that individuals with this degree of hearing loss are good candidates for the use of hearing aids, but argue that individuals with moderately severe hearing loss are those who benefit most from the use of these devices, which disagrees with the observed in this study.

As for lack of benefit in the subject with mild hearing loss, it can be justified by the fact that the possibility of a disproportionate commitment between speech understanding and degree of hearing loss are often seen in elderly individuals. Thus, losses initially considered mild can be translated into deep commitments of the central auditory processing, i.e. inherent intrinsic complementary redundancies of the central nervous system tend to decrease with increasing age[21]. This fact may explain benefits not very satisfactory with the use of hearing aids in people with mild hearing loss as well as observed in the present study.

However, among subjects with bilateral hearing loss of varying degrees, it was not possible to verify the relationship between the degree of loss and the benefit obtained by them due to this asymmetry.

Finally, it is worth noting that there is need for further studies to evaluate the benefit of hearing aid users in a larger sample, without limiting the type and degree of hearing loss, enabling the findings to be extrapolated to the population of Porto Velho and region. Furthermore, it is suggested that referrals be made of individuals who did not benefit of (central) auditory processing and phonoaudiological conduct.

CONCLUSION

Through the results obtained in this study it can be concluded that most of the elderly obtained benefit with the use of hearing aids.

There was significant reduction of hearing difficulties with the use of the prosthesis in relatively favorable environments, in environments with high noise and reverberant environments.

In individuals with symmetrical hearing loss, there was greater benefit in those who presented with moderate loss.

RESUMO

Objetivo: verificar o benefício do aparelho de amplificação sonora individual na população idosa de Porto Velho, Rondônia e região, além de comparar os achados encontrados com o grau da perda auditiva instalada na população estudada. **Método:** fizeram parte deste estudo 18 idosos com idade entre 60 e 82 anos, portadores de deficiência auditiva neurossensorial de grau leve a moderadamente severo. O benefício foi avaliado por meio do questionário Abbreviated Profile of Hearing Aid Benefit – APHAB, nas condições sem e com prótese auditiva, sendo tal questionário aplicado no momento da adaptação e três meses após a mesma. Para análise das respostas foram consideradas as seguintes subescalas: Facilidade de comunicação, ruído ambiental, ruído reverberante e aversão a sons. O benefício obtido por subescala foi comparado com o grau da perda auditiva de cada sujeito. **Resultados:** foi verificado benefício nas subescalas facilidade de comunicação, ruído ambiental e ruído reverberante, tendo tal achado apresentado diferença estatisticamente significante. Quanto à relação do benefício com o grau da perda, verificou-se, dentre os sujeitos com perda auditiva simétrica, maior benefício nos que apresentavam perda auditiva neurossensorial de grau moderado, porém dentre os indivíduos com perdas auditivas de graus diferentes, não foi possível verificar relação entre o grau da perda e o benefício obtido pelos mesmos. **Conclusão:** houve redução das dificuldades auditivas com o uso da amplificação sonora em ambientes favoráveis, reverberantes e com elevado nível de ruído.

DESCRITORES: Presbiacusia; Auxiliares de Audição; Questionários; Idoso; Adaptação

REFERENCES

1. Magni C, Freiberger F, Tonn K. Avaliação do Grau de Satisfação entre os usuarios de amplificação de Tecnologia Analógica e digital . Rev Bras Otorrinolaringol. 2005,71(5):650-7.

2. Mota LB. O que determina nosso envelhecimento? Que é envelhecimento? Rio De Janeiro: EdUERJ; 1998. A saúde do idoso: a arte de cuidar. p 57-9.

3. Musiek FE, Rintelmann WF. Perspectivas atuais em avaliação auditiva. São Paulo: Manole; 2001. p.5.

4. Almeida K, Iório MCM. Próteses auditivas: fundamentos e aplicações clínicas. São Paulo: Lovise; 1996.

5. Veiga LR, Merlo ARC, Mengue SS. Satisfação com a prótese auditiva na vida diária em usuários do sistema de saúde do exercito. Rev Bras Otorrinolaringol. 2005;71(1):67-73.

6. Ávila VD. Impacto da protetização auditiva na qualidade de vida do Idoso [Graduação]. Belo Horizonte: Universidade Federal de Minas Gerais –Faculdade de Medicina; 2008.

7. Cox RM, Stephens D, Kramer SE. Translation of the international outcome inventory for hearing aids (IOI-HA). Int J Audiol. 2002;41(1):3-26.

8. Ventry IM, Weinstein BE. The hearing handicap inventory for the elderly: a new tool. Ear Hear. 1982;3:128-34.

9. Willot JF. Physiological plasticity in the auditory system and its possible relevance to hearing aid use, deprivation effects and acclimatization. Ear Hear. 1996;17(3):665-775.

10. Gatehouse S. The time course and magnitude of perceptual acclimatization to frequency responses: Evidence from monoaural fitting of hearing aids. J Acoust Soc Am. 2002;92(3):1258-68.

11. Munro KJ. Reorganization of the adult auditory system: Perceptual and physiological evidence from monoaural fitting of hearing aids. Trends Amplif. 2008;12(3):245-70.

12. Prates LPCS, Iório MCM. Aclimatização: Estudo do reconhecimento de fala em usuários de próteses auditivas. Pró-Fono R. Atual. Cient. 2006;18(3):345-51.

13. Humes LE, Wilson DL, Barlow NN, Garner C. Changes in hearing-aid benefit following 1 or 2 years of hearing-aid use by older adults. J Speech Lang Hear Res. 2002;24(4):772-82.

14. Cox RM. Administration and application of the APHAB. Phonak Focus. 1996;21 Suppl:1-12.

15. Freitas CD, Costa MJ. Processo de adaptação de próteses auditivas em usuários atentidos em uma instituição pública federal – Parte II: Resultados dos questionários de auto-avaliação. Rev. Bras. Otorrinolaringol. 2007;73(5):660-70.

16. Megale RL, Iório MCM, Schochat E. Treinamento auditivo: avaliação do benefício em idosos usuários de próteses auditivas. Pró-Fono R. Atual. Cient. 2010;22(2):101-6.

17. Silman S, Iório MCM, Mizhahi MM, Parra VM. Próteses auditivas: um estudo sobre seu benefício na qualidade de vida de indivíduos portadores de perda auditiva neurossensorial. Distúrbios da Comunicação. 2004;16(2):153-65.

18. Bucuvic EC, Iório MCM. Benefício e dificuldades auditivas: Um estudo em novos usuários de prótese auditiva após dois e seis meses de uso. Fono Atual. 2004;29(7):19-29.

19. Costa MHP, Sampaio ALL, Oliveira CACP. Avaliação do Benefício da Prótese Auditiva Digital e da Percepção da Desvantagem Auditiva ou "Handicap" em Idosos não Institucionalizados. Arq. Int. Otorrinolaringol. 2007;11(2):159-68.

20. Almeida K, Santos TMM. Seleção e adaptação de próteses auditivas em crianças. In: Almeida K, Iório MCM. Próteses auditivas: fundamentos e aplicações clínicas. São Paulo: Lovise; 2003. P. 357-84.

21. Russo ICP. Intervenção fonoaudiológica na terceira idade. Rio de Janeiro: Revinter; 1999. Distúrbios da audição: a presbiacusia; p. 51-82.

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