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RESEARCH

THE EFFECTS OF BEHAVIOR TYPE AND ANGER PARAMETERS ON HEARING AID SATISFACTION IN HEARING AID USERS

ABSTRACT

Introduction: Hearing loss is a very common disorder in the elderly population. The purposes of this study were to compare scores on the International Outcome Inventory for Hearing Aids in subjects with hearing aids under and over the age of 65, and also to examine the effect of Type A behavior and anger profile on International Outcome Inventory for Hearing Aids scores in older adults.

Materials and Method: In this study there were two groups, consisting of 64 subjects between the ages of 40 to 85, fitted with hearing aids. The first group (Group I) included subjects aged >65 and the second group (Group II) included subjects aged ≤ 65. To determine behavior types and anger parameters, all subjects in both groups were evaluated on the Escala Retiro de Patron de Conducta Tipo A scale and State-Trait Anger Expression Inventory. Satisfaction with hearing aid was evaluated using the International Outcome Inventory for Hearing Aids questionnaire. Behavior types, anger parameters and satisfaction with hearing aid were compared statistically.

Results: Averages of International Outcome Inventory for Hearing Aids scores for Group I and Group II were 28.8±5.6 and 29.0±6.6, respectively. 56% of subjects in Group I and 53% of subjects in Group II had type B behavior. International Outcome Inventory for Hearing Aids, behavior types and anger parameters were analyzed between the two groups, and no statistically significant relation was found ($p>0.05$).

Conclusion: According to this study, the types of behavior and/or aging have no significant effect on hearing aid satisfaction.

Key Words: Aging, Hearing Loss; Hearing Aid, Anger, Behavior.



ARAŞTIRMA

DAVRANIŞ TİPİ VE ÖFKE PARAMETRELERİNİN İŞİTME CİHAZI KULLANANLARDA İŞİTME CİHAZI MEMNUNİYETİ ÜZERİNE ETKİLERİ

Öz

Giriş: İşitme kaybı, yaşlı popülasyonda oldukça yaygın bir rahatsızlıktır. Bu çalışmanın amaçları, 65 yaş altı ve üzeri işitme cihazı kullanan kişilerde 'Uluslararası İşitme Cihazı Değerlendirme Envanteri' puanlarının karşılaştırılması ve aynı zamanda Tip A davranışın ve öfke profilinin işitme cihazı memnuniyeti üzerine etkisinin değerlendirilmesi idi.

Gereç Yöntem: Çalışmada, 40 ile 85 yaş arası işitme cihazı kullanıcısı 64 bireyden oluşan iki grup yer aldı. İlk grup (Grup I) 65 yaş üzerindeki bireylerden, ikinci grup (Grup II) 65 yaş ve altındaki bireylerden oluşmaktaydı. Davranış tipleri ve öfke parametrelerinin belirlenmesi için her iki grupta yer alan tüm bireyler 'Escala Retiro de Patron de Conducto Tipo A' skalası ve 'Sürekli Öfke İfadesi Envanteri' ile değerlendirildi. İşitme cihazı memnuniyeti ise 'Uluslararası İşitme Cihazı Değerlendirme Envanteri' ile değerlendirildi. Davranış tipleri, öfke parametreleri ve işitme cihazı memnuniyeti istatistiksel olarak karşılaştırıldı.

Bulgular: Grup I ve Grup II'de 'Uluslararası İşitme Cihazı Değerlendirme Envanteri' skor ortalamaları 28.8±5.6 ve 29.0±6.6 idi. Grup I'deki bireylerin %56'sı, Grup II'deki bireylerin %53'ü tip B davranışa sahipti. 'Uluslararası İşitme Cihazı Değerlendirme Envanteri', davranış tipleri ve öfke parametreleri her iki grupta analiz edildi ve istatistiksel olarak anlamlı bir ilişkinin olmadığı saptandı ($p>0.05$).

Sonuç: Bu çalışmaya göre, davranış tipi ve/veya yaşlanmanın işitme cihazı memnuniyeti üzerine anlamlı bir etkisi yoktur.

Anahtar Sözcükler: Yaşlanma; İşitme Kaybı, İşitme Cihazı; Öfke, Davranış.

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INTRODUCTION

Hearing loss related to presbycusis is a common problem in the elderly population. Age-related hearing features are characterized by slowed central processing of acoustic information, reduced hearing sensitivity and speech comprehension in noisy environments, and disordered localization of sound sources (1). Most alterations in auditory system initially begin in young adulthood, but geriatric hearing impairment becomes evident at age 60 or older and continues during the seventh decade (2-4).

Left untreated, hearing loss can lead to reduced quality of verbal communication and some psychological problems such as anxiety, depression, social isolation, behavior disorders and sleeping problems (5-7). Hearing aid rehabilitation is the mainstay of treatment for people with age-related sensorineural hearing loss. Also, rehabilitation with hearing aids is one of the important factors reducing stress and anxiety levels (6). Difficulties in conversation because of hearing loss are perceived as a barrier by people. Types of behavior in subjects with hearing loss may directly affect this process. The most accepted classification of behavior types is Type A and Type B personality theory. Many authors have reported that people with Type A behavior have a higher risk for health problems. Type A behavior includes aggressiveness, competitiveness, irritability, work orientation, worrying about deadlines, urgency, etc. (8-10). Anger is one of the essential parameters of Type A personality (6,11,12). In hearing aid rehabilitation programs, some questionnaires such as the IOI-HA are useful tools to evaluate hearing aid satisfaction (13).

There are many published studies about type of behavior and anger profiles in various pathologies, such as 'hearing loss and depressive symptoms in elderly' (6,10,14). According to our knowledge there is no study comparing type of behavior, anger profile and satisfaction of hearing aid in elderly subjects. Furthermore, there are scarcely any studies comparing the hearing aid satisfaction using the IOI-HA -TR in subjects under and over the age of 65 in Turkey. Kirkim et al stated for those of patients with hearing loss, only 30 out of 98 patients accepted to wear a hearing aid (4). When hearing impaired elderly patients were not fitted with hearing aids they could not overcome verbal communication problems so to face inevitable unpleasant feeling of having misunderstood the content of a conversation. This condition may lead social isolation for some of the elderly patients. Adaptation and counseling after each fitting hearing aid is far more crucial especially for the elderly population (4). Thus, quality of life

as well as emotional problems of hearing impaired elderly patients may be improved when their problems with verbal communication skills solved. The purpose of this study was twofold:

To examine the score of IOI-HA-TR in subjects under and over the age of 65 fitted with hearing aids.

To compare the impact of Type A behavior with the ERCTA scale and Anger Inventory on the International Outcome Inventory for Hearing Aids (IOI-HA) scores in older adults under and over the age of 65 fitted with hearing aids.

MATERIALS AND METHOD

In this study, a total of 64 patients with hearing aids, aged 40 to 85, were enrolled. Participants were divided into two groups, Group I and Group II. Group I included subjects aged >65, and Group II included subjects aged ≤65. For each subject, ear, nose and throat examinations were normal. One inclusion criterion was use of a hearing aid for at least 6 months (mean time of use: 3.7 years). Acoustic immittance, transient-evoked otoacoustic emission testing, pure tone audiometry, and speech audiometry results were analyzed. All subjects of both groups completed the ERCTA-TR (Escala Retiro de Patron de Conducto Tipo A- Turkish Version), STAXI-TR Anger Inventory (State-Trait Anger Expression Inventory Turkish Version) and IOI-HA-TR (International Outcome Inventory for Hearing Aids- Turkish Version). The protocol of this study was approved by the Local Ethical Committee with protocol number 937-GOA (04/11/2013) and all participants provided written, informed consent.

Turkish Version of International Outcome Inventory for Hearing Aids (IOI-HA-TR)

IOI-HA-TR (15) scores of the two groups were evaluated. IOI-HA was developed for use in research settings to facilitate cooperation among researchers in different hearing healthcare settings. A rating of 1-5 is assigned to each of the seven questions, total scores from 1 to 35, with higher ratings indicating greater satisfaction-benefit (13). The inventory, which was originally produced in English, has been translated into more than 20 languages (16) and is widely used in hearing aid rehabilitation programs (17).

ERCTA-TR Scale

Turkish Version of the ERCTA Scale was used to assign subjects to one of three groups, based on behavior type (14). This



Table 1— Audiological Data of The Aided Ear in Group I (>65 years) and II (≤65 years)

	Group I (>65 years mean and standard deviation)	Group II (≤65 years mean and wstandard deviation)
Average pure tone thresholds at 0.5, 1 and 2kHz (dB HL)	49.18±11.3	49.1±12.5
Average pure tone thresholds at 1, 2 and 4 kHz (dB HL)	55.9± 10.7	56.4±12.5
Speech perception threshold (dB HL)	57.7±12.3	56.3±13.9
Speech discrimination score (%)	67.8±18.6	68.5±18.0

Table 2— Percentage Scores of Behavior Types, Total Anger Index (STAXI-TR) and IOI-HA-TR

	Behavior type according to the ERCTA scale (Type HighA : 27-40 , Type A: 22-26 , Type B 8-21 point)						STAXI score	IOI-HA-TR score
	Type High A		Type A		Type B			
	Percent of patient (%) (Number)	Mean±SD	Percent of patient (%) (Number)	Mean±SD	Percent of patient (%) (Number)	Mean±SD		
Group I (>65 years)	6% (2)	28.0±1.4	38% (13)	23.5±1.4	56% (19)	19.0±2.4	31.29±12.47	28.8±5.6
Group II (≤65 years)	3% (1)	27.0	44% (13)	24.0±1.7	53% (16)	19.2±1.6	3 6.40±10.11	29.0±6.6

questionnaire is composed of eight items with a 5-point response scale (10). Participants were divided into three subgroups as Type A, Type higher A and Type B personalities according to ERCTA scores. A score of higher than 26 on the ERCTA scale is considered to be indicative of a higher type A personality. A score of 22 to 26 is considered to be indicative of a type A, and lower than 22 is considered as a type B.

STAXI-TR Scale

The Turkish Version of the STAXI Scale was used for the assessment of anger in Groups I and II. (14,18). This scale evaluated the intensity of anger as an emotional state at a particular time. This psychometric tool evaluates anger isolated from hostility and aggression, covering the anger's experience and expression. "Five of the subscales from the STAXI were used to measure the experience and expression/control of anger. The 10-item trait anger scale (T-Ang) assesses one's propensity to experience anger. Likert-type items (1= "not at all" to 4= "always") yield total scores from 10 to 40, with higher scores representing higher levels of trait anger. The four 8-item anger expression and control scales were also used to evaluate anger expression-in (AX-I), anger expression-out

(AX-O), anger control in (AC-I), and anger control out (AC-O). AX-I measures unhealthy anger suppression, while AX-O shows aggressive anger expression. AC-I evaluates the control of angry feelings by relaxing and cooling off, and AC-O describes the control of anger by not expressing it towards other people or objects. The 10-item state anger scale (S-Ang) measures intensity of angry feeling.

Statistical Analyses

All statistical analyses were performed using SPSS version 15.0. Data from Groups I and II were analyzed using descriptive statistics. The significance of the difference between these groups was analyzed using the Mann-Whitney U test and Kruskal-Wallis variance analyses. The level of significance in all tests was set at a p value of less than 0.05.

RESULTS

The total sample was composed of 64 subjects in two groups. Group I consisted of 34 subjects (23 males, 11 females) with a mean age of 73.8±5.5 (min 66 years- max 85 years). The second group (Group II) consisted of 30 subjects



(17 males, 13 females) with a mean age of 51.5 ± 10.8 (min 40 years- max 65 years).

Of those subjects, 35 had high frequency hearing loss, and 29 had other various types of hearing impairments. Audiogram configurations of Group I and II were similar to each other. No statistical difference in audiological data of aided ears for Group I and II was found ($p > 0.05$) (Table 1). The average IOI-HA-TR scores for Group I and Group II were 28.8 ± 5.6 , 29.0 ± 6.6 , respectively (Table 2). These results are correlated with high satisfaction, probably related to use of a hearing aid.

Anger parameters and type of behavior obtained from subjects in Group I were compared to those of Group II. 56 % of subjects in Group I and 53 % of subjects in Group II had type B behavior (Table 2). Averages of S-ANG, T-ANG and AX-Index scores in Group II were higher than scores in Group I (Figure 1). Types of behavior, Anger parameters and IOI-HA-TR scores were compared with one another, and no statistically significant differences were found ($p > 0.05$).

DISCUSSION

Age related hearing loss or presbycusis, the most common type of hearing loss in older adults, is a multifactorial sensorineural loss that frequently includes a component of impaired speech discrimination. Presbycusis leads to adverse effects on the cognitive, emotional, behavioral and social function of older adults (7). Residual hearing should be optimized by using hearing aids in the elderly. Thus, their quali-

ty of life will be better than before. Some sources have indicated that untreated elderly with hearing loss often suffer from feelings of sadness, anxiety, depression, insecurity and social isolation (6). It has been shown that audiological rehabilitation improved environmental interaction as well as patients' emotional and social profiles (1,6). There are some studies examining the relationship between various diseases such as coronary heart disease and the feature of behavior-anger parameters (9,10,14). Other investigations concern the use hearing aids and satisfaction inventories (15,17,19). However, there is no published study about the effects of the feature of behavior and anger parameters on hearing aid satisfaction.

In this study, we investigated whether there is an effect of behavior type and anger parameters on the satisfaction of subjects fitted with hearing aids. Thus, Type A behavior and Anger Profile scores were compared with IOI-HA scores obtained from subjects over and under 65 years of age. Since the World Health Organization (WHO) describes people aged over 65 as old, the subjects in this study were separated into two groups: ages 40 to 65, and those over 65 (20).

People with decreased speech comprehension ability related to hearing loss perceive this situation as a handicap (10). It could be expected that these people may exhibit Type A behavior features and anger reactions. In our study, Type A and Type B behavior rates in Group I were 38% and 56%, respectively. In Group II, the rates of Type A and Type B were 44% and 53%, respectively (Table 2). It was remarkable

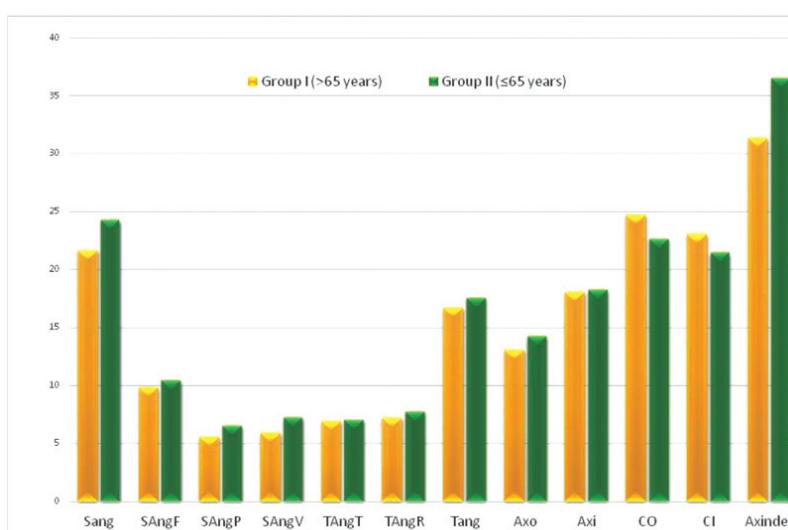


Figure 1— After the extraction of lower right 2. molar tooth. Alveolar socket with granulation tissue bordered with infected alveolar bone.



that more than half of the patients had type B behavior in both groups. In the literature, it has been pointed out that the possibility of separating individuals into two groups as "Type A" or "Type B" is not possible, and individuals may not show all of the properties of the behavior types. Furthermore, single behavior features that individuals show have no meaning and value (21). Hariri et al. stated that physical illness is a kind of chronic stress that can cause an emotional response by disrupting the balance of the person's life. Interactions between the disease and the psychosocial environment of the person have identified the type and severity of emotional response. Consequently, behavior and responses to disease symptoms may vary depending on "how the person perceives the disease", and "to what extent the person accepts the disease" (22). The present study reflect these findings from the literature, in that the patients with type A behavior characteristics have adapted to the use of a hearing aid and have higher satisfaction with their hearing aid. It should be pointed out that the study groups accepting the rehabilitation program with hearing aids were mostly made up of individuals exhibiting behavior characteristics of type B.

To our knowledge, this is the first study investigating possible associations among behavior pattern, anger inventory and International Outcome Inventory for Hearing Aids with elderly subjects. Study groups were similar in terms of parameters of audiological data, sex, type of behavior and anger. The only difference between the groups was "age". In the light of the results, it was concluded that being over age of 65 has no negative effect on hearing aid satisfaction. Kahveci et al. concluded that aging may have a negative effect on regular use of hearing aids and patient satisfaction (23). In this study only patients who had regularly used hearing aids for at least 6 months were included. The Kahveci et al. study results cannot be compared with our results regarding the use of hearing aids. In our study, hearing aid satisfaction was found to be similar between the people aged over 65, who are referred to as old according to the World Health Organization, and those aged under 65.

CONCLUSION

It was concluded that two factors leading to similarity between the two age groups are: the type B behavior rate, which is over than 50% in both groups, and rehabilitation of the patients with proper hearing aids. It is expected that proper rehabilitation with hearing aids, regular ear, nose, throat as well as audiological examinations, and further con-

sultations, will positively affect hearing aid satisfaction. It is well known that properly fitted hearing aids can successfully reduce the social, emotional, and functional handicap resulting from hearing impairment in elderly patients. Thus, especially in the elderly, audiological evaluation and hearing aid fitting should be performed by a skilled audiologist. Furthermore, counseling after each fitting is crucial. In rehabilitation with hearing aid, elderly people need to be well informed about how to improve their verbal communication skills such that the speaker should talk face-to-face with the listener, speak clearly, turn off noise sources (TV, radio). Thus, elderly people can be encouraged to wear hearing aid to overcome verbal communication problems. By providing that type of care, otolaryngologists and audiologists can improve the quality of life of elderly patients with well fitted hearing aids.

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