CLINICAL STUDY

THE ROLE OF DEPRESSION, STRESS AND ANXIETY IN PATIENTS WITH SUDDEN SENSORINEURAL HEARING LOSS: CORRELATION WITH THE DASS-42 SCALE

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SUMMARY

Objective: Our aim is to understand the mood states of the patients suffering from sudden hearing loss in terms of anxiety, stress and depression. Its role in etiology and its effect on prognosis was also investigated.

Methods: The study included 100 patients (67 males, 33 females; mean age 46.5 years) who were diagnosed with sudden sensorineural hearing loss (SSHL). The DASS-42 questionnaire, which measures depression, anxiety, and stress, was filled out before the treatment of SSHL. Audiometric tests were performed to determine the pure tone average on days 1,3 and 7.

Results: There was no difference between males and females according to DASS-42 mean depression, anxiety and stress scores (p = 0.785, p = 0.832, p = 0.712, respectively). While there was no statistically significant difference between the presence and absence of tinnitus in terms of depression and stress scores, a statistically significant difference was observed in terms of mean anxiety scores (p = 0.817, p = 0.134, p = 0.032, respectively). There was no statistically significant difference in mean depression scores between the groups with and without recovery, while the mean scores of anxiety and stress were statistically significant (p = 0.427, p = 0.012, p = 0.036, respectively).

Conclusion: Anxiety and stress may be an etiologic factor and affect prognosis in SSHL.

Keywords: Depression, Anxiety, Stress, Sudden sensorineural hearing loss

ANİ SENSORİNÖRAL İŞİTME KAYBI OLAN HASTALARDA ETYOLOJİ VE PROGNOZDA DEPRESYON, STRES VE ANKSİYETENİN ROLÜ: DASS-42 ÖLÇEĞİ İLE KORELASYON

ÖZET

Amaç: Bu çalışmada, ani işitme kaybı geçiren hastaların duygu durumları anksiyete, stres ve depresyon açısından araştırıldı. Ayrıca, bu hastalıkların etyolojideki rolü ve prognoz üzerindeki etkisi de araştırıldı.

Yöntem ve Gereçler: Çalışmaya ani sensörinöral işitme kaybı tanısı konulmuş 100 hasta (67 erkek, 33 kadın; ortalama yaş 46,5 (17- 80) dahil edildi. Ani sensorinöral işitme kaybı tanısıyla tedavi edilen her hastanın depresyon, anksiyete ve stres durumu tedaviye başlamadan önce Depresyon Anksiyete Stres ölçeği (DASS-42) ile değerlendirildi. Saf ses ortalamalarını belirlemek için 1,3 ve 7. günlerde odyometrik testler yapıldı.

Bulgular: DASS-42 ortalama depresyon, anksiyete ve stres puanlarına göre kadın ve erkekler arasında fark saptanmamıştır (sırasıyla p=0.785, p= 0.832, p=0.712). Tinnitus varlığı ve yokluğu arasında depresyon ve stres puan ortalamaları açısından istatistiksel olarak anlamlı fark izlenmezken, anksiyete puan ortalaması açısından istatistiksel olarak anlamlı fark izlenmiştir (sırasıyla p=0.817, p=0.134, p= 0.032). İyileşme olan ve iyileşme olmayan gruplar arasında depresyon puan ortalamaları istatistiksel olarak anlamlı derecede fark izlenmezken, anksiyete ve stres puan ortalamaları istatistiksel olarak anlamlı derecede fark izlenmiştir (sırasıyla p=0.427, p=0.012, p=0.036).

Sonuç: Anksiyete ve stresin ani sensorinöral işitme kaybında etyolojik bir faktör olabileceği ve prognozu etkileyebileceği düşünülmektedir.

Anahtar Sözcükler: Depresyon, Anksiyete, Stres, Ani sensorinöral işitme kaybı

INTRODUCTION

Sudden sensorineural hearing loss (SSHL) is the presence of at least 30 dB of sensorineural hearing loss in three consecutive frequencies that develop within 72 hours[1]. The incidence is 5-20 / 100.000 and constitutes approximately 1% of all sensorineural hearing loss. Equality is observed in the distribution of female / male ratio. It is usually seen between the ages of 30-60 years, 90% unilateral[2]. Although there are many factors in the etiology, viral, vascular and autoimmune pathologies are mostly emphasized. It is seen in the literature that many different treatment protocols are applied, but the only agent with proven efficacy is steroids[3]. In a small number of cases, a specific agent is detected, while the other part is considered as sudden idiopathic sensorineural hearing loss[1-3]. In 70% of SSHL patients, tinnitus accompanies the picture. While there is a poor prognosis

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associated with vertigo, several studies evaluating tinnitus as a good or bad prognostic factor have been reported in the literature[4].

Anxiety, stress and depression are psychiatric disorders affecting approximately 10-28% of the world population[5]. Ear-nose-throat diseases caused by depressive disorders, stress and anxiety have been increasing gradually. Depression, stress and anxiety have been shown to be associated with vestibular and cochlear pathologies such as tinnitus and vertigo[6]. In otology and neurotology practice, 1/4 of women and 1/6 of men encounter these diseases at some point in their lives[5,6]. Recent studies proposed that psychiatric comorbidities might be seen in patients with SSHL at a higher rate than normal patients[7].

In this study, we determined the depression, stress and anxiety levels of patients with SSHL by DASS-42 scale and aimed to show the contribution of these psychiatric disorders to the prognosis and possible importance of these psychiatric disorders in the etiology.

MATERIAL and METHODS

This study was conducted in the Department of Otorhinolaryngology in Aksaray University Training and Research Hospital in accordance with the World Medical Helsinki Declaration. Ethical committee approval was obtained. All patients were informed about the study and signed an informed consent form. Routine biochemistry, hemogram, sedimentation, C-reactive protein (CRP), prothrombin time, activated partial thromboplastin time, TORCH panel, thyroid function tests were performed.

The study included 100 patients over the age of 16 and under 80 years of age, who developed within 72 hours at 3 consecutive frequencies and who had at least 30 dB sensorineural hearing loss. Patients with a history of acoustic trauma, taking ototoxic drugs and having a history of psychiatric disease were excluded from the study.

Steroid treatment was applied to the patients for systemic, intratympanic and combined methods. Methyl prednisolone was administered by intravenous infusion as a systemic steroid. On the first day, 150 mg was started in the form of a pus, and on the second day it was continued at 1 mg / kg and cut down after 7 days. As an intratympanic steroid, dexamethasone was administered by eardrum injection once a day for 7 days. Under the microscope, 0.5-1 ml dexamethasone (4 mg / ml) was applied to the posterior-inferior quadrant with a 25 G spinal needle to fill the middle ear. Routine treatment protocol was applied to all patients with steroid. Routine treatment program with steroid in our clinic; The proton pump inhibitor is orally twice a day, vitamin complex is once a day orally, Piracetam is 3 times a day orally, Betahistin HCL is 24 mg tablets 2 times a day and is a salt-free diet. Each patient was evaluated with DASS-42 scale for depression, anxiety and stress.

DASS-42 Questionnaire

In our country, validity and reliability study was conducted by Bilgel and Bayram (2009). Uncu et al. Translated by Turkish. The scale is a 42-item document designed to measure the symptoms of depression, anxiety, and stress that have been present from the time of administration. It is a psychometric scale consisting of 42 four-point Likert-type questions, 14 of which are questioning depression, anxiety and stress symptoms. In terms of depression, 0-9 points were accepted as healthy. 10-13 points were considered as mild, 14-20 points as moderate, 20-27 points as advanced, and 28 and above points as very advanced depression. In terms of anxiety, those who scored 0-7 were considered healthy. 8-9 points were considered mild, 10-14 points were moderate, 15-19 points advanced, and 20 and above were considered as very advanced anxiety. In terms of stress, those who scored 0-14 were considered healthy. 15-18 points were considered as mild, 19-25 points as moderate, 26-33 points as advanced, and 34 and above points as very advanced stress[8].

Audiometry

Audiological tests; pure voice audiometry, tympanometry, acoustic reflex measurements were performed. Audiological evaluation was performed with an Interacustic brand AC 40 model. The first pure audiometric examinations of the patients at 250, 500, 1000,

2000, 4000 and 8000 Hz pure sound averages were repeated on the 1st, 3rd, 7th days. The improvement in hearing was evaluated according to the criteria defined by Furahashi[9]. Pure voice mean (SSO) <25 dB improvement, full improvement, SSO> 30 dB and above, significant improvement, SSO 10-30 dB, mild improvement and SSO 0-10 db, no improvement It was evaluated.

Statistical analysis

SPSS v25.0 was used for statistical analysis. Continuous variables were expressed as mean ± standard deviation (SD). Kolmogorov-Smirnov test was used to evaluate the distribution of variables. Student's t test was used for normal distributions of continuous variables. P <0.05 was accepted as significant.

RESULTS

Of the patients included in the study, 67 were male (67%) and 33 were female (33%). The mean age was 46.5 (17-80) years. There was no statistically significant difference between male and female patients in terms of DASS-42 depression score average, anxiety score average and stress score average (p = 0.785, p = 0.832, p = 0.712, respectively) (Table 1).

The presence of tinnitus in the patients was questioned subjectively. The presence of tinnitus after SSHL changes DASS-42 scale scores. The mean depression score (9.48 ± 7.12), the mean anxiety score (7.87 ± 5.72) and the mean stress score (14.69 ± 7.16) of the patients with tinnitus after SSHL, the mean depression score (8.7 ± 6.12) and the mean anxiety score (6.12) in the absence of tinnitus. ± 3.15) and the mean stress score (12.02 ± 7.47). While there was no statistically significant difference between the presence and absence of tinnitus in terms of depression and stress scores, a statistically significant difference was observed in terms of mean anxiety scores (p = 0.817, p = 0.134, p = 0.032, respectively) (Table 2).

When the improvement in hearing was examined according to Furahashi criteria; Of 66 patients receiving systemic steroid treatment, 20 (30,30%) had complete improvement, 5 (7,57%) had significant improvement and 17 (25,75%) had mild improvement, 24 (36,36%) No improvement was seen in the patient. Of the 20 patients receiving intratympanic treatment, 6 (30%) had complete improvement, 3 (15%) had significant improvement, 9 (45%) had mild improvement, and 2 (10%) did not. Of the 14 patients who received combined therapy, 3 (21.42%) had complete improvement, 3 (21.42%) had significant improvement, 4 (28.57%) had mild improvement, and 4 (28.57%) No improvement was seen in the patient.

The patients were divided into two subgroups according to improvement in their hearing and were evaluated for DASS-42 scores. Those with full recovery and partial recovery were the group with recovery and those without recovery were grouped with no recovery. The mean depression score (8.48 ± 7.82), the mean anxiety score (6.32 ± 2.16), and the mean stress score (11.38 ± 6.06) were found in the recovery group; The mean score of depression (9.67 ± 7.11), anxiety score (8.12 ± 2.27) and stress score (17.02 ± 7.47) were found in the non-recovery group. Depression mean scores of the two groups were not statistically significant, whereas anxiety and stress mean scores were statistically significant (p = 0.427, p = 0.012, p = 0.036, respectively) (Table 3).

Table 1. Depression, anxiety and stress score average between male and female patients in terms of DASS-42

	Depression Score			**Anxiety Score**			**Stress Score**		
	Mean	**(min-max)**	***P***	**Mean**	**(min-max)**	***P***	**Mean**	**(min-max)**	***P***
Female (33)	9.1 ±6.86	0-36	0.785	7.87 ±5.72	0-33	0.832	14.18 ±7.06	2-37	0.712
Male (67)	9.9 ±7.53	0-38		8.11 ± 5.86	0-26		13.2 ± 7.36	0-38	

Table 2. Difference between the presence and absence of tinnitus in terms of mean depression, anxiety and stress scores

	Depression Score			**Anxiety Score**			**Stress Score**		
	Mean	**(min-max)**	***P***	**Mean**	**(min-max)**	***P***	**Mean**	**(min-max)**	***P***
Tinnitus(+)	9.48 ± 7.12	0-38	0.817	8.72 ±3.16	0-33	0.032	14.69 ± 7.16	1-37	0.134
Tinnitus(-)	8.7 ± 6.12	0-38		6.12 ± 3.15	0-30		12.02 ± 7.47	0-35	

Table 3. Depression, anxiety and stress score average between recovery and non-recovery group

	Depression Score			**Anxiety Score**			**Stress Score**		
	Mean	**(min-max)**	***P***	**Mean**	**(min-max)**	***P***	**Mean**	**(min-max)**	***P***
Recovery group	8.48 ± 7.82	0-38	0.427	6.32 ± 2.16	0-31	0.012	11.38 ±6.06	0-35	0.036
Non-recovery group	9.67 ± 7.11	0-38		8.12 ± 2.27	0-33		17.02 ±7.47	1-37	

Recovery group: With full recovery and partial recovery

Non-recovery group: With no recovery

DISCUSSION

The etiopathogenesis of SSHL is still controversial. Autoimmune mechanisms, viral infections, metabolic causes, vascular disorders, membrane ruptures and neoplasms have been implicated in the etiology. Recent studies have shown that immune system defects and decreased inflammatory response may lead to SSHL. They also reported that a specific etiology was detected in a small number of cases, while the most of cases were considered as idiopathic[9,10].

Lazarini et al. reported that psychiatric disorders associated with emotional status may alter neurovascular mechanisms through sympathetic activity, disrupting cochlea perfusion, but may result in the development of SSHL due to a combination of emotional and organic factors[11]. In a study by Lin et al., Patients with depressive disorders were 1.45 times more at risk for SSHL than those without depressive disorders[12]. In our study, no statistically significant difference was found between DASS-42 scores of patients treated with SSHL and DASS-42 scores of patients without improvement, but statistically significant difference was observed in terms of anxiety and stress scores.

It is emphasized that the role of inflammatory response system in the pathogenesis of SSHL is of great importance. It may be related to the decrease in SSHL inflammatory response caused by depression, stress and / or anxiety[12]. A meta-analysis of 22 studies by Hannestade et al. Reported that a decrease in the inflammatory response may lead to neural atrophy in the hippocampal region and may be associated with depressive disorders[13]. These studies suggest that depression, stress, and anxiety may both indirectly affect capillary vascular tone, as well as the direct effects of inflammatory markers such as TNF alpha, IL-6, and C-reactive protein on the cochlea.

Depressive diseases, stress and anxiety have been associated with some diseases such as coronary artery disease, hypertension, diabetes and hyperlipidemia[14]. However, there are not many studies investigating the relationship between anxiety, depression and stress-like disorders and SSHL. Therefore, depressive disorders, stress and anxiety are likely to cause SSHL by reducing blood flow in the cochlea by means of vascular sclerosis and thrombosis. Chung et al. ' In a retrospective study of 3522 patients, they found that anxiety levels of patients with SSHL were significantly higher than the control group in terms of anxiety and depressive diseases[15]. In our study, no difference was observed between the groups treated for different parameters such as coronary artery disease, diabetes and hyperlipidemia, which may be risk factors for vascular sclerosis and thrombosis.

Chen et al.'s study also showed that patients with sudden sensorineural hearing loss who could not fully recover had more severe depressive symptoms associated with greater emotional distress. Patients with tinnitus and vertigo symptoms experienced higher rates of depressive disorder and mental state deterioration than those without. Stresses that may lead to sudden hearing loss have been associated with depressive diseases that may occur as a result of this disease[16]. In our study, various parameters such as severity of hearing loss and audiogram type, tinnitus and dizziness, time of initiation of treatment and steroid treatment, accompanying systemic diseases and age were investigated in terms of prognosis of SSHL. Impaired emotional status is seen in patients who have not fully recovered after SSHL and who have not completely resolved tinnitus. In our study, while there was no statistically significant difference between the presence and absence of tinnitus in terms of depression and stress mean scores, a statistically significant difference was observed in terms of mean anxiety score. Tinnitus can cause anxiety, but studies have also shown that depression, stress, and anxiety can also lead to SSHL and tinnitus[17,18].

In a study conducted by Zadeh et al. In 2003, more cochlear pathologies were detected in elderly patients and age was shown to be poor prognosis[19]. In our study, no significant difference was found in DASS-42 depression, anxiety, and stress mean points in patients with

SSHL. We believe that this may be due to the relatively low number of patients and the difference in the number of patients or between regions. The limited number of patients, the evaluation of depression, stress and anxiety with only one scale and the inability to evaluate psychiatric histories in detail in the patients' past seem to be limitations in our study.

Depressive disorder is more common in patients who fail to recover after SSHL treatment[17-19]. Current evidence suggests that psychological disorders such as depression and anxiety have a negative impact on the quality of life of patients with SSHL[18,19]. The authors of this study have reported that clinicians increase the risk of developing SSHL in patients with affective disorders, suggesting that special measures should be taken to reduce the risk of depression and anxiety disorder[17]. In our study, we planned to use a scale in order to detect patients with poor prognosis with the onset of hearing loss.

CONCLUSION

The etiopathogenesis of SSHL is an autological emergency which is still unclear and the researches on this subject are still continuing. In our study, we think that depression, anxiety and stress may have a significant effect on the development of SSHL and progros. We think that further studies on this subject are needed.

Compliance with Ethical Standards:

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Disclosures:

The authors state that they have no funding, financial relationships, or conflicts of interest.

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