

The effects of depression and anxiety levels on the status of recovery in patients with idiopathic sudden sensorineural hearing loss

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Abstract

Objective: To compare the severity of anxiety and depression symptoms in idiopathic sudden sensorineural hearing loss (ISSHL) patients with (n=33) and without (n=17) recovery, and healthy control group.

Methods: This study was conducted on ISSHL inpatients (n=50) and a healthy control group (n=52). Severity of the anxiety and depression symptoms was assessed using the State-Trait Anxiety Inventory (STAI) and Beck Depression Inventory (BDI) during admission. Hearing data of all 50 cases obtained at baseline and after the treatment (at the end of the 4th week) were gathered from the audiological evaluation form of each patient.

Results: The rates of ISSHL patients with and without recovery were 66% and 34%, respectively. The mean BDI and STAI-II scores of the patients with ISSHL were significantly higher than those of the control group (11.4±8.6 vs. 6.8±4.3 and 41.6±7.3 vs. 36.7±8.4, respectively; p<0.05). Among the ISSHL patients, there was a moderate and significant positive correlation between the BDI and STSI-II scores (r=0.617, p<0.05). The mean BDI, STAI-I, and STAI-II scores of the control group were significantly lower than those of the recovery and no recovery groups (p<0.05). However, the recovery and no-recovery groups did not show any difference in terms of mean BDI, STAI-I and STAI-II scores (p>0.05).

Conclusion: ISSHL patients had a more depressive and anxious mood compared to the healthy controls. However, anxiety and depressive mood had no effect on the recovery status of the ISSHL patients. Physicians also need to pay attention to the status of anxiety and depressive symptoms in patients with ISSHL.

Keywords: Idiopathic sudden sensorineural hearing loss, anxiety, depression.

Özet: Depresyon ve anksiyete düzeylerinin idiyopatik ani sensorinöral işitme kaybı olan hastaların iyileşme durumlarına etkileri

Amaç: Çalışmanın amacı ani idiyopatik sensorinöral işitme kaybı olup iyileşen (n=33) ve iyileşmeyen (n=17) hastalarda ve sağlıklı kontrollerde anksiyete ve depresyon semptomlarının şiddet derecesini karşılaştırmaktır.

Yöntem: Bu çalışma hastanede yatan sensorinöral işitme kayıplı hastalarla (n=50), sağlıklı kontrol grubunda (n=52) gerçekleştirildi. Anksiyete ve depresyon semptomlarının şiddet derecesi hastaneye kabul sırasında uygulanan Durumsal Sürekli Kaygı Envanteri (STAI) ve Beck Depresyon Envanteri (BDI) ile değerlendirildi. Başlangıçta ve tedavi sonrasında (4. haftanın sonunda) her bir hastanın odyolojik değerlendirme formundan 50 olgunun tüm işitme verileri elde edildi.

Bulgular: ISSHL hastalarının %66'sı iyileşmiş, %34'ü iyileşmemişti. ISSHL hastalarının ve kontrol deneklerin ortalama BDI ve STAI-II skorları sırasıyla 11.4±8.6 vs. 6.8±4.3 ve 41.6±7.3 vs. 36.7±8.4 (p<0.05) olup, ISSHL hastalarının değerleri kontrol grubundan anlamlı derecede daha yüksek idi. ISSHL hastalarında BDI ve STSI-II skorları arasında orta derecede ve anlamlı pozitif korelasyon mevcuttu. (r=0.617, p<0.05). Kontrol grubunun ortalama BDI, STAI-I ve STAI-II skorları, iyileşen ve hiç iyileşmeyen gruplara göre anlamlı derecede daha düşüktü (p<0.05). Ancak iyileşmiş ve hiç iyileşmemiş gruplar arasında ortalama BDI, STAI-I ve STAI-II skorları açısından anlamlı farklılık gözlemlenmedi (p>0.05).

Sonuç: Sağlıklı kontrollere göre ISSHL hastaları daha depresif ve endişeli bir ruh hali içindeydi. Ancak anksiyete ve depresif ruh hali ISSHL hastalarının iyileşme durumunu hiçbir şekilde etkilememiştir. Doktorlar ISSHL hastalarının anksiyete ve depresif semptomlarına da dikkat etmelidir.

Anahtar sözcükler: İdiyopatik ani sensorinöral işitme kaybı, anksiyete, depresyon.

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Received: March 23, 2016; **Accepted:** May 14, 2016

Online available at:
www.entupdates.org
doi:10.2399/jmu.2016002011
QR code:



Idiopathic sudden sensorineural hearing loss (ISSHL), which is usually a unilateral condition, is considered as an otological emergency. It may range from slight impairment of hearing to virtual deafness. Although the clinical definition of ISSHL is not strictly clear, hearing loss of at least 30 dB in three consecutive frequencies in the standard pure tone audiogram over 72 hours or less stands as the most commonly used definition.^[1-4] Understanding the factors contributing to recovery in ISSHL is an important challenge in ear, nose and throat (ENT) practice. In this context, being at a younger age, male gender, shorter elapsed time between the onset of hearing loss and initiation of treatment, lower self-reported depressive symptoms and upward-sloping or cupeloid audiogram are reported to be associated with better outcomes.^[5,6]

Depression is one of the leading causes of disability worldwide.^[7] Poor self-care and adherence to medical regimens, amplification of somatic symptoms and disability, high medical care utilization, and increased morbidity and mortality from medical illness have been associated with depression^[8] while anxiety is a significant factor contributing to disability, morbidity, and mortality.^[7] As the literature shows a high level of comorbidity between depression and anxiety,^[9,10] it may be necessary to evaluate anxiety while studying the effects of depression on recovery from a physical illness.

In patients having no hearing problem before the onset of ISSHL, unilateral hearing loss can be a very sudden change^[11] causing stress, anxiety and fear. Several studies have investigated the relationship of mood, anxiety and physical illnesses, and reported that patients with depression, other mood states or anxiety have poorer treatment outcomes.^[5] In the current literature, there is a limited number of studies on the association between treatment outcomes in ISSHL and level of depression and anxiety. The aim of the present study was to compare the level of self-reported anxiety and depression in ISSHL patients with and without recovery after administering a treatment and following-up for a period of four weeks.

Materials and Methods

Study population

This cross-sectional study was conducted on inpatients with ISSHL at the ENT clinic of our university hospital. Before starting the study, an approval was obtained from Human Research Ethics Committee of our university. All patients (n=63) treated between October 2014 and May 2015 were offered to participate in the study. After obtain-

ing written informed consents, the final study population consisted of 50 patients.

Acute-onset hearing loss without any recognizable cause, untreated sudden hearing loss having a sensorineural origin, application to hospital within 7 days of onset, not being lost to follow-up during recovery, having a hearing level of 30 dB over at least three frequencies, normal hearing in the contralateral ear (a 40 dB HL air conduction pure-tone average [PTA] at 0.25, 0.5, 1, 2, 4, and 8 Hz frequencies), having no prior hearing loss or ear surgery in the affected ear and lack of impairment of the cranial nerves (except cranial nerve VIII)^[12] were the inclusion criteria.

The exclusion criteria were having a history of trauma, otological surgery or barotrauma during the previous 4 weeks, having cerebellopontine angle pathology, congenital cochlear malformations, neurological disorders, recent use of ototoxic drugs, having a neoplasm during the previous 2 years, or having another major disorder (such as hypertension, coronary artery disease, liver or renal dysfunction, diabetes mellitus, chronic obstructive pulmonary disorder, etc.) or any ontological disorder such as otitis media during the previous 4 weeks and receiving a psychiatric treatment. The data on the inclusion and exclusion criteria were gathered from the patients, first degree relatives and patients' files.

Healthy controls

Fifty-two (52) age- and gender-matched control subjects were recruited from the university hospital. None of them was on any form of prescribed psychiatric medication. None of the healthy volunteers had any of the exclusion criteria listed above. The data on the exclusion criteria and prescribed psychiatric medications were gathered from the participants, first degree relatives, and participants' files.

Study measures

The State-Trait Anxiety Inventory (STAI)^[13] is a widely used self-evaluation questionnaire measuring the state and trait anxiety. It contains two subscales composed of 20 items. The state (STAI-I) subscale measures the anxiety associated with any specific situation or time-period at the moment of the questionnaire) while the trait (STAI-II) subscale measures the relatively stable anxiety which show how a person feels on a day-to-day basis. A 4-point Likert scale is used to rate the responses. The total state and total trait anxiety scores vary from 20 to 80 points. A higher score shows a higher anxiety level while a lower score shows a lower anxiety level. The Turkish validation of the STAI was conducted by Öner and Le Compte in 1983.^[14]

Beck Depression Inventory (BDI)^[15] is a self-evaluation scale. It consists of 21 items to evaluate the level and severity of depression symptoms. It provides a quadruple Likert-type measurement. The points assigned to each item vary between 0 to 3 while the total points vary between 0 and 63. The Turkish validation and reliability check of BDI was performed by Hisli.^[16]

Hearing data of all 50 cases obtained by AC-40 Interacoustics Clinic Audiometer (Interacoustics, Assen, Denmark) at baseline and after the treatment (at the end of the 4th week) were gathered from the audiological evaluation form of each patient.

Study procedure

The patients were given the BDI, STAI-I and II forms on the first day of hospitalization at the ENT clinic. The STAI and BDI forms were evaluated by a senior psychiatrist (DGM).

ISSHL was defined as a hearing loss of 30 dB or more over at least 3 contiguous frequencies in 72 hours.^[3]

During their initial visits, a complete clinical history was obtained from the patients and standard audiological examinations consisted of pure-tone tests were performed. Then, all the patients were given the same treatment protocol with i.v. methylprednisolone (1 mg/kg per day, Prednol-L ampoule; Mustafa Nevzat Drug Industry, Istanbul, Turkey), tapering the dose 10 mg every 3 days within the following days. While being on corticosteroids, the patients were administered H2 receptor inhibitor ranitidine 1x11 ampoule i.v. (Ulcuran ampoules 50 mg/2 ml iv; Yavuz Drug Industry, Istanbul, Turkey), oral vitamin B1 (2x250 mg thiamine hydrochloride) and B6 (250 mg pyridoxine hydrochloride; Nerox B tablet; Abdi İbrahim Pharmaceutical Company, Istanbul, Turkey) for three months. Then, 100 mg pentoxifylline (Vasoplan AMP 100 mg/5 ml; Mustafa Nevzat Drug Industry, Istanbul, Turkey) was added into 500 ml Voluven (Fresenius Kabi AG, Bad Homburg, Germany) and administered by intravenous infusion every other day for eight days.

All ISSHL patients underwent a pure-tone speech audiometry. Pure tone thresholds were obtained for air conduction at 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, and 6 kHz and for bone conduction at 250 Hz, 500 Hz, 1 kHz, 2 kHz, and 4 kHz. The methods recommended by the Hearing Committee of the American Academy of Otolaryngology Head and Neck Surgery were used to report the audiological data obtained. In order to follow-up

the treatment responses of the patients, the audiological evaluation was carried out every other day and repeated for 4 weeks after the end of the treatment. Using the Siegel criteria, a classification was made based on the treatment outcomes and the pure tone averages obtained during the follow-ups after one month term.^[17,18] Patients having ISSHL were divided into two subgroups by taking into account whether their PTAs recovered (complete, partial and slight recovery) or not.

Statistical analysis

All the variables were summarized using descriptive statistics. The data obtained were analyzed using the Statistical Package of Social Science (SPSS Inc., Chicago, IL, USA) version 22.0 for Windows and presented as mean \pm SD and percentage as appropriate. The mean BDI, STAI-I and STAI-II scores of the ISSHL and the control groups were compared by the Student's t-test. The correlations between the BDI, STAI-I, and STAI-II scores were analyzed using the Pearson's correlation coefficients. The gender rates and the mean BDI, STAI-I, and STAI-II of the patients and the control groups were compared with chi-square test and one-way analysis of variance (ANOVA), respectively. Tukey's multiple comparison procedure was performed when significant main effects were present. $P < 0.05$ was regarded as significant.

Results

Sixty-three inpatients with ISSHL were found to be eligible to participate in the study. After refusal of five patients to participate in the study and eight patients being excluded from the study for not meeting the inclusion criteria, the final study population consisted of 50 patients. In terms of age and gender, there was no difference between the patient and the control groups. The average ages of the patient and the control groups were 38.3 ± 13.19 and 35.2 ± 7.83 years, respectively. 30 (60%) of those in the patient groups and 26 (50%) of those in the control group were male. Following the treatment, the recovery rate was 33 (66%) in the patient group.

The comparison of the ISSHL patients and the control groups in terms of pre-treatment anxiety and depression levels is shown in Table 1. The mean BDI and STAI-II scores were significantly higher in patients with ISSHL when compared to the control group (Table 1). Among ISSHL patients, the BDI and STSI-II scores showed a moderate correlation and a significant correlation, respectively ($r = 0.617$, $p < 0.05$).

The gender rates of the patient groups and the control group were similar ($p>0.05$) (Table 2).

The mean BDI, STAI-I and STAI-II scores of the control group were significantly lower than those of the recovery and no-recovery groups ($p<0.05$). However, there was no difference between the recovery and no-recovery groups in terms of the mean BDI, STAI-I and STAI-II scores ($p>0.05$) (Table 3).

Discussion

Our aim was first to evaluate the pre-treatment depression and anxiety levels of the patients having ISSHL and then to compare the patient groups (recovery and no-recovery groups) and healthy controls in terms of the said levels. Our study revealed that the depression and anxiety levels of the ISSHL patients were higher when compared to the healthy controls. However, when ISSHL patients recovering and not recovering after the treatment were compared, the depression and anxiety levels were found to be similar.

The hearing loss observed in ISSHL cases is a sudden change. Most of the times, the patients experiencing a sudden hearing loss do not have a history of such a loss.^[1] For this reason, this extraordinary event causes anxiety in such patients. Hearing loss may lead to difficulties in communication and learning, reduce productivity, and increase depression, anxiety and social isolation.^[19] Due to social isolation, the level of psychiatric symptoms may be higher in people having hearing impairment.^[5,20,21]

Various studies have investigated the prognostic significance of depression or anxiety in patients having physical illnesses such as myocardial infarction, cancer or asthma. In some studies, recovery has been reported to be negatively affected by anxiety or depression.^[7,12,22] Similarly, a limited number of studies have evaluated the effects of only depression or only anxiety on the prognosis of ISSHL.^[5,23] In the current study, we have evaluated both the depression and the anxiety levels of ISSHL patients during the pre-treatment period and found a positive relation between depression and anxiety levels. Moreover, we used an anxiety instrument (STAI-II) found to be correlated with depression levels in many studies; however, the depression and anxiety levels before the treatment were similar in the recovery and no-recovery groups. This result is in conflict with the previous findings.^[5,24] The major reason of having such a result can be related with having a limited number of participants. Another reason can be the non-evaluation of the depression and anxiety levels of the recovery and no-recovery groups after the

Table 1. Comparison of the pre-treatment anxiety and depression levels of ISSHL patients and healthy controls.*

	Patients (n=50)	Control (n=52)
BDI	11.4±8.6 [†]	6.8±4.3
STAI-I	39±11.4	35±9.4
STAI-II	41.6±7.3 [†]	36.7±8.4

*The data are presented as the mean ± standard deviation. The data were compared using the Student's t-test. [†],[‡] $p<0.05$ vs. control.

Table 2. Comparison of gender ratios in the recovery, no-recovery and control groups.*

	Recovery (n=33)	No-recovery (n=17)	Control (n=52)
Female	13 (65%)	7 (35%)	26 (50%)
Male	20 (66.7%)	10 (33.3%)	26 (50%)

*The data are presented as percentages. The data were compared using the chi-square test.

Table 3. Comparison of depression and anxiety of the recovery and no-recovery groups having sudden hearing loss and the control group.*

	Recovery (n=33)	No-recovery (n=17)	Control (n=70)
Beck depression inventory	10.9±8.9	11.9±8.4	6.8±4.3 [†]
STA-I	37.9±10.5	40.6±13.4	35.4±9.4
STA-II	40.9±6.9	43.9±6.8	36.7±8.4 [‡]

*The data are presented as the mean ± standard deviation. The data were compared using the ANOVA. [†],[‡]Significantly lower compared to the recovery and no-recovery groups ($p<0.05$).

treatment. Evaluating the depression and anxiety levels only at the beginning of the treatment but not evaluating afterwards is one of the major limitations of the present study. An important finding of our study is that both the trait anxiety and the depression levels were higher in the ISSHL group when compared to the healthy controls. STAI-I (trait anxiety), which is a widely used anxiety instrument, is considered as a measurement tool for the general negative effect. Although being an anxiety specific instrument stands as a drawback, STAI-II has been proven to be a good instrument in assessing the general psychopathology. Recent studies have shown the importance

of this tool as a marker that predicts high impairment and comorbidity in anxiety and depression disorders.^[25-27] Finding a higher level of anxiety and depression in ISSHL patients compared to the healthy controls shows the importance of evaluating the psychiatric dimension in ISSHL patients. The results we obtained show both the effects of anxiety and depression on the prognosis of ISSHL and the importance of evaluating the psychiatric dimension in these patients. We consider this situation in another dimension; it has been emphasized in the literature that inflammation may have a role in the etiology of depression and anxiety and similarly in the etiology of ISSHL.^[28-30] In a study on the efficiency of TNF- α inhibitor on depression and anxiety in individuals having a chronic physical disease, Abbott et al.^[29] have shown that the said TNF- α inhibitor treatment decreases depression in patients having a chronic disease. Similarly, Demirhan et al.^[31] have shown that TNF- α inhibitor treatment can be effective in the treatment of ISSHL patients. As a result, taking into account that depression, anxiety and ISSHL may have similar pathophysiologies and that our results showed a higher level of anxiety and depression in ISSHL patients when compared to the controls, one may postulate that evaluation of the psychiatric dimension in ISSHL patients is important.

Our study had some limitations that need to be taken into consideration in future studies. First of all, our sample was composed of only inpatients, which may raise the concern of generalizability. Secondly, the present study was based on a cross-sectional data that cannot be used to determine causal relationships. It would be beneficial to determine the depression and anxiety levels after the treatment. Thirdly, the questionnaires used to evaluate anxiety and depression were self-reported instruments not yielding an objective data. Lastly, our small sample size prevented us to generalize the results to the overall ISSHL population. Based on the limitations of the present study, we suggest conducting studies on larger populations composed of both outpatients and inpatients.

As a conclusion, our results demonstrate that patients with ISSHL have higher levels of depression and anxiety when compared to healthy controls. The comparison between recovery and no-recovery groups showed no difference in terms of depression and anxiety symptoms. Future studies are required to determine the impact of depression and anxiety on the pathogenesis of ISSHL.

Conflict of Interest: No conflicts declared.

References

- Schreiber BE, Agrup C, Haskard DO, Luxon LM. Sudden sensorineural hearing loss. *Lancet* 2010;375:1203-11.
- Lawrence R, Thevasagayam R. Controversies in the management of sudden sensorineural hearing loss: an evidence-based review. *Clin Otolaryngol* 2015;40:176-82.
- Stachler RJ, Chandrasekhar SS, Archer SM, et al.; American Academy of Otolaryngology-Head and Neck Surgery. Clinical practice guideline: sudden hearing loss. *Otolaryngol Head Neck Surg* 2012;146(3 Suppl):S1-35.
- Chau JK, Cho JJ, Fritz DK. Evidence-based practice: management of adult sensorineural hearing loss. *Otolaryngol Clin North Am* 2012;45:941-58.
- Chen J, Liang J, Ou J, Cai W. Mental health in adults with sudden sensorineural hearing loss: an assessment of depressive symptoms and its correlates. *J Psychosom Res* 2013;75:72-4.
- Xenellis J, Karapatsas I, Papadimitriou N, et al. Idiopathic sudden sensorineural hearing loss: prognostic factors. *J Laryngol Otol* 2006;120:718-24.
- Balon R. Mood, anxiety, and physical illness: body and mind, or mind and body? *Depress Anxiety* 2006;23:377-87.
- Katon W, Sullivan MD. Depression and chronic medical illness. *J Clin Psychiatry* 1990;51 Suppl:3-11.
- Sartorius N, Ustün TB, Lecrubier Y, Wittchen HU. Depression comorbid with anxiety: results from the WHO study on psychological disorders in primary health care. *Br J Psychiatry Suppl* 1996;(30):38-43.
- Hirschfeld RM. The comorbidity of major depression and anxiety disorders: recognition and management in primary care. *Prim Care Companion J Clin Psychiatry* 2001;3:244-54.
- Carlsson PI, Hall M, Lind KJ, Danermark B. Quality of life, psychosocial consequences, and audiological rehabilitation after sudden sensorineural hearing loss. *Int J Audiol* 2011;50:139-44.
- Kanzaki S, Sakagami M, Hosoi H, Murakami S, Ogawa K. High fibrinogen in peripheral blood correlates with poorer hearing recovery in idiopathic sudden sensorineural hearing loss. *PLoS One* 2014;9:e104680.
- Spielberger, CD, Gorsuch, RL, Lushene RE. Manual for the state-trait anxiety inventory. Palo Alto, CA: Consulting Psychologist Press; 1970.
- Öner N, Le Compte A. Durumluluk-süreklilik kaygı envanteri el-kitabı. İstanbul: Boğaziçi Üniversitesi Matbaası; 1983.
- Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry* 1961;4:561-71.
- Hisli N. Beck depresyon envanterinin üniversite öğrencileri için geçerliliği ve güvenilirliği. *Psikoloji Dergisi* 1989;7:3-13.
- Siegel LG. The treatment of idiopathic sudden sensorineural hearing loss. *Otolaryngol Clin North Am* 1975;8:467-73.
- Wilson WR, Byl FM, Laird N. The efficacy of steroids in the treatment of idiopathic sudden hearing loss. A double blind clinical study. *Arch Otolaryngol* 1980;106:772-6.
- Huang Q, Tang J. Age-related hearing loss or presbycusis. *Eur Arch Otorhinolaryngol* 2010;267:1179-91.

20. Malhotra R, Chan A, Ostbye T. Prevalence and correlates of clinically significant depressive symptoms among elderly people in Sri-Lanka: findings a national survey. *Int Psychogeriatr* 2010;22:227–36.
21. Roest AM, Heideveld A, Martens EJ, de Jonge P, Denollet J. Symptom dimensions of anxiety following myocardial infarction: associations with depressive symptoms and prognosis. *Health Psychol* 2014;33:1468–76.
22. Kang HJ, Kim SY, Bae KY, et al. Comorbidity of depression with physical disorders: research and clinical implications. *Chonnam Med J* 2015;51:8–18.
23. Chung SD, Hung SH, Lin HC, Sheu JJ. Association between sudden sensorineural hearing loss and anxiety disorder: a population-based study. *Eur Arch Otorhinolaryngol* 2015;272:2673–8.
24. Schüssler G, Geishauser E, Rürger U. Psychosomatic factors in idiopathic sudden deafness. [Article in German] *HNO* 1992;40:4–9.
25. Andrade L, Gorenstein C, Vieira Filho AH, Tung TC, Artes R. Psychometric properties of the Portuguese version of the State-Trait Anxiety Inventory applied to college students: factor analysis and relation to the Beck Depression Inventory. *Braz J Med Biol Res* 2001;34:367–74.
26. Curtis GC, Magee WJ, Eaton WW, Wittchen HU, Kessler RC. Specific fears and phobias. Epidemiology and classification. *Br J Psychiatry* 1998;173:212–7.
27. Nestadt G, Bienvenu OJ, Cai G, Samuels J, Eaton WW. Incidence of obsessive-compulsive disorder in adults. *J Nerv Ment Dis* 1998;186:401–6.
28. Furtado M, Katzman MA. Examining the role of neuroinflammation in major depression. *Psychiatry Res* 2015;30:229:27–36.
29. Abbott R, Whear R, Nikolaou V, et al. Tumour necrosis factor- α inhibitor therapy in chronic physical illness: a systematic review and meta-analysis of the effect on depression and anxiety. *J Psychosom Res* 2015;79:175–84.
30. Ulu S, Ulu MS, Bucak A, Ahsen A, Yucedag F, Aycicek A. Neutrophil-to-lymphocyte ratio as a new, quick, and reliable indicator for predicting diagnosis and prognosis of idiopathic sudden sensorineural hearing loss. *Otol Neurotol* 2013;34:1400–4.
31. Demirhan E, Eskut NP, Zorlu Y, Cukurova I, Tuna G, Kirkali FG. Blood levels of TNF- α , IL-10, and IL-12 in idiopathic sudden sensorineural hearing loss. *Laryngoscope* 2013;123:1778–81.

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Please cite this article as: Mert DG, Durmuş K, Kelleci M, Doğan Karataş T, Altuntaş EE. The effects of depression and anxiety levels on the status of recovery in patients with idiopathic sudden sensorineural hearing loss. *ENT Updates* 2016;6(2):95–100.