

Tinnitus Prevalence Among the Primary Care Patients in Kayseri, Türkiye

Kayseri İlinde Sağlık Ocaklarına Başvuran Hastalarda Tinnitus Prevalansı

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Abstract

Aim: This investigation was carried out in order to determine the prevalence of tinnitus among the adults in the provincial centre of Kayseri and the effects of some medical, social and demographic factors on the prevalence of tinnitus.

Material and Methods: Eleven of 40 primary health centers in the provincial center of Kayseri were selected randomly. A total of 900 individuals were chosen from the patients who referred to these health centers. A questionnaire was applied by face to face interviewing method. Twenty-one people were excluded for incomplete answers. Totally 879 questionnaires (97.7%) were evaluated. Binary logistic regression analysis were performed for statistical analysis.

Results: Total prevalence rate of tinnitus was found as 32.9%. Prevalence rate of tinnitus among the females was found higher than the males (37.5% and 27.4% respectively). Prevalence rates of tinnitus among the people who have hypertension, anaemia, hearing loss and who are working or worked at the noisy places were higher than the others. The effects of age, diabetes mellitus and hearth diseases were not found significant.

Conclusion: Approximately one third of the study group has tinnitus. Tinnitus prevalence among the females is higher than the males. Hypertension, anaemia, hearing loss and working at noisy places increase tinnitus prevalence.

Key words: **Adult; Tinnitus; Prevalence.**

Özet

Amaç: Bu çalışma Kayseri il merkezindeki yetişkinlerde kulak çınlaması prevalansını, çeşitli sosyodemografik faktörlerin kulak çınlaması prevalansına etkisini ve çınlamanın bazı tıbbi yakınmalar ve hastalıklarla ilişkisini belirlemek amacıyla yapılmıştır.

Materyal ve Metod: Kayseri il merkezindeki 40 sağlık ocağından 11 tanesi rasgele seçildi. Bu sağlık merkezlerine başvuran hastalardan rasgele seçilen 900 kişi araştırma kapsamına alındı. Hastaların sosyodemografik özellikleri, kulak çınlaması ve diğer tıbbi yakınmaları ile ilgili 27 sorudan oluşan bir anket formu yüz yüze görüşme yöntemiyle uygulandı. Cevapların yetersiz olması nedeniyle 21 kişi çalışmadan çıkarıldı. Toplam 879 anket (%97,7) değerlendirildi. İstatistiksel analiz için binary logistic regresyon analizi uygulandı.

Bulgular: Kulak çınlaması prevalansı %32,9 olarak bulundu. Kadınlarda kulak çınlaması prevalansı erkeklerden daha yüksek bulundu (sırasıyla %37,5 ve %27,4). Hipertansiyon ve anemisi olanlarda ve gürültülü ortamda çalışmakta ya da çalışmış olanlarda kulak çınlaması prevalansı daha yüksek bulundu. Yaş, diabetes mellitus ve kalp hastalığının kulak çınlaması prevalansı üzerine istatistiksel olarak önemli bir etkisi bulunmadı.

Sonuç: Araştırma bölgesindeki yetişkinlerin yaklaşık üçte birinde kulak çınlaması vardır. Kadınlarda kulak çınlaması prevalansı erkeklerden yüksektir. Hipertansiyon, anemi ve gürültülü ortamda çalışma kulak çınlaması prevalansını artırabilir.

Anahtar Kelimeler: **Yetişkin; Çınlama; Prevalans.**

Introduction

Tinnitus means perception of sound without existence of an external stimulant (1). Prevalence rate of tinnitus is between 3% and 30% in depending on the definition of tinnitus and on the study group (2). Approximately 40 million people in United States of America (USA) suffer from chronic tinnitus according to Seidman and Jacobson (3). However, only 25% of them report their status as serious. In England, it has been reported that 17% of the population have chronic tinnitus, but only 14% of those who have tinnitus suffer from tinnitus very seriously (4).

Tinnitus cases are divided into two subgroups as subjective and objective tinnitus depending on the perceptibility of the tinnitus by the physician who examines. According to the qualification of the sound perceived by the person tinnitus can be classified as pulsatile and nonpulsatile tinnitus. Pulsatile tinnitus can be caused by a vascular aetiology and it may be either subjective or objective. Nonpulsatile tinnitus is generally subjective and is the most widespread form of tinnitus (1). Tinnitus is usually together with hearing loss however it may be together with normal hearing.

Major causes of pulsatile tinnitus are gathered in three groups as; arterial, venous and extra vascular. The reasons of nonpulsatile tinnitus are constitutional lesions, autological illnesses or existence of tinnitus together with hearing loss without any constitutional lesions (1, 5).

Severity of the tinnitus may range from a hardly recognizable to serious and life influencing level. Tinnitus is generally subjective and can only be perceived by the patient and this makes it hard to evaluate and measure the disorder. While tinnitus is not a state of serious disorder for some patients, it disturbs others awfully. The reason for this difference between the patients is not the altitude, tone or other characteristics of the sounds they hear. Many investigations show that seriousness of tinnitus is not directly associated with these psychoacoustic parameters (6–8). Tinnitus of the same level may be regarded as intolerable by a patient while it may be even unrecognisable for another patient (9). Severity of tinnitus is generally directly associated to insomnia, anxiety and depression (7, 10, 11). These symptoms may bring about a vicious circle.

This investigation was performed in order to determine the prevalence of tinnitus in adults between the ages of 18–64 who applied to primary health centres in the

provincial centre of Kayseri for any reasons, the effects of various socio-demographic factors on the prevalence rate of tinnitus, the relations between tinnitus and some medical complaints and illnesses.

Material and Methods

This cross-sectional and descriptive study was performed in the provincial center of Kayseri in 2008. The study was approved by the Erciyes University Medical Faculty Ethics Committee.

Prevalence rate of tinnitus in the study area was accepted to be about 30%. Minimum sample size was calculated to be 870 with a 0.95 confidence level and 0.03 tolerance value. It was planned that 900 people should be taken in study sample.

There were 40 primary health centres in the provincial centre of Kayseri. Eleven primary health centres were selected randomly. A total of 900 people between the ages of 18–64 who applied to these primary health centres between 01–30 April 2008 and who accepted to participate were taken into the study. A questionnaire prepared by the researchers and including of 27 questions, related to the individuals' socio-demographic characteristics, status of tinnitus and medical complaints, was applied to the individuals through face to face interviewing method by the investigators. Twenty-one questionnaires were excluded because of inadequate answers. Thus, data related to 879 people were evaluated.

In the questionnaire, economical status and general health condition of the individuals were evaluated in five categories according to their own statements as, “very good, good, middle, poor and very poor”. In the statistical analyses, “very good” and “good” answers were combined and referred as “good”; again “very poor” and “poor” answers were combined and referred as “poor”.

State of tinnitus was evaluated in three categories in accordance with the statements of the people as “still exists”, “existed before and then disappeared” and as “never existed”. Objective and subjective tinnitus cases were not differentiated. While evaluating the current state of tinnitus, the cases in which tinnitus existed before and then disappeared were evaluated together with those who never had tinnitus.

Unpaired t test and chi square test were used for statistical analysis. Logistic regression analysis was used to assess

the effects of some independent variables on the prevalence of tinnitus. In all analyses, P values less than 0.05 were accepted as statistically significant

Results

Some socio-demographic characteristics of the study group have been presented in Table I.

Table I. Socio-Demographic Characteristics of the Study Group.

Characteristics	Groups	Number	%
Gender	Male	402	45.7
	Female	477	54.3
Age groups (year)	18 – 39	599	68.1
	40 - 64	280	31.9
Residence	Urban	657	74.7
	Rural	222	25.3
Educational level	Primary school or lower	257	29.2
	Secondary school or over	622	70.8
Economic level of the family	Good	280	31.9
	Middle	530	60.3
	Poor	69	7.8
Social security	Yes	738	84.0
	No	141	16.0
Working at noisy places	Yes	214	24.3
	No	665	75.7
Listening to loud music	Yes	324	36.9
	No	555	63.1
General health condition	Good	491	55.9
	Middle	324	36.9
	Poor	64	7.2
Total		879	100

Of the study group, 32.9% (289 people) stated that they have tinnitus. Additionally, 11.6 % (102 people) of the study group stated that they had tinnitus previously.

Distribution of individuals, who have tinnitus, according to the various characteristics of the tinnitus is shown in Table II.

Table II. Distribution of Tinnitus Cases According to the Various Characteristics of the Tinnitus.

Characteristics	Groups	Number	%
Duration of tinnitus (year)	0 – 4	171	59.2
	5 – 9	50	17.3
	10 and more	68	23.5
The site of tinnitus	Right	76	26.3
	Left	55	19.0
	Both of the ears	158	54.7
Level of disturbance from tinnitus	Mild	172	59.5
	Moderate	78	27.0
	Serious	39	13.5
Time of disturbance from tinnitus	Day	69	23.9
	Night	108	37.4
	Day and night	53	18.3
	Never	59	20.4
Total		289	100.0

Logistic regression analysis has been applied to evaluate the impacts of various socio-demographic, environmental

and medical factors on the prevalence of tinnitus, and the results obtained have been shown in Table III.

Table III. Impacts of Some Socio-Demographic, Environmental and Medical Factors on the Prevalence of Tinnitus (Results of the Logistic Regression Analysis)

Independent variables	Groups	n	Tinnitus		OR (CI 95 %)
			Number	%	
Gender	Male	402	110	27.4	1.00
	Female	477	179	37.5	1.41 (1.02 – 1.95)*
Age groups (year)	18 – 39	599	186	31.1	1.00
	40 - 64	280	103	36.8	1.11 (0.78 – 1.59)
Working at noisy places	No	665	208	31.3	1.00
	Yes	214	81	37.9	1.55 (1.10 – 2.18)*
Hypertension	No	762	226	29.7	1.00
	Yes	117	63	53.8	2.24 (1.39 – 3.60)*
Anaemia	No	682	202	29.6	1.00
	Yes	197	87	44.2	1.65 (1.15 – 2.37)*
Diabetes mellitus	No	834	266	31.9	1.00
	Yes	45	23	51.1	1.59 (0.81 – 3.13)
Heart disease	No	812	256	31.5	1.00
	Yes	67	33	49.3	1.33 (0.74 – 2.40)
Hearing loss	No	761	225	29.6	1.00
	Yes	118	64	54.2	2.42 (1.60 – 3.65)*
Total		879	289	33.0	

*: $P < 0.05$

As shown in the table III, it was determined that prevalence rate of tinnitus is significantly higher among the women than the men. On the other hand, tinnitus was found more prevalent among the people who have hypertension, anaemia, hearing loss and who are working or worked at the noisy places.

Only 15.6% of those who have tinnitus have stated that they applied to the physician because of this complaint and 24.4% of them stated they benefited from the suggestions of the physician.

Discussion

Tinnitus is a clinical symptom reason of which is not clearly explained, whose pathogenesis has not come to light but on which many factors are thought to have effects. It is hard to make an exact determination of the prevalence of the tinnitus in the community due to its being a subjective symptom and to the hardship in diagnosis. Prevalence rates were reported to be 19.3% and 11.8% orderly according to the two questionnaires

firstly related to their general health conditions and then related to tinnitus applied to people between the ages of 55–65 in Belgium (12). Prevalence rates of tinnitus were found to be 14.5% among the adults in Italy and to be 37.3% among the people who are at the age of 60 or over in Holland (13,14). Prevalence rate of tinnitus lasting longer than five minutes was reported to be 17% in a study held only over men between the ages of 53–75 in Denmark (15). In a cross-sectional study performed in Germany, there was tinnitus in 31% of the participants and 19.5% of them lasted shorter than five minutes while 11.5% of them lasted much longer (16). In our study current prevalence of tinnitus is found to be 33% according to the statements of people between the ages of 18–64. These differences between the studies may be caused by the difference between communities, between age groups and between the diagnosis criteria. In our study tinnitus cases were determined according to the own statements of the people disregarding the duration of tinnitus. Additionally, it should be taken into consideration that, our study group have been formed from the primary care patients.

Tinnitus cases were evaluated of various characteristics. As seen in Table II more than half of the cases are lasting shorter than five years. Although tinnitus is slightly more prevalent in right ear than the left ear it is felt in both ears most commonly. This situation make us think that systemic factors which can affect both ears stand in the forefront rather than the factors that are related to one of the ears in aetiology of the tinnitus.

More than half of the people having tinnitus stated that they were mildly disturbed from this situation while 13.5 % of them stated that they were seriously disturbed. The fact that only 15.6 % of those having tinnitus applied to the physician for tinnitus supports that many cases of tinnitus give a mild level of discomfort. In a study performed in USA by Seidman and Jacobson (3), 25% of those having tinitus and in another study performed in England by Hazell, 14% of those having tinnitus stated that the tinnitus disturbed them seriously (4).

Tinnitus disturbs people mostly at nights. This situation is valid for all chronic illnesses. Lack of other works to concentrate at nights, the environment's being more silent and the negative effect it has on getting into sleep makes the tinnitus more disturbing at nights.

Although it is known that there are many factors affecting tinnitus, impacts of some factors on prevalence of tinnitus is not clearly defined. Different results are obtained in researches studying the effects of various socio-demographic, environmental and medical factors on the prevalence of tinnitus.

As seen in Table III, effect of age on the prevalence rate of tinnitus is not found to be significant. In a study performed among the workers working in noisy environments it is determined that the age has not a prominent effect on tinnitus (17). In another study in which 660 people were screened, prevalence of tinnitus is determined to increase together with age in both genders being more characteristic in women (14). In a study depending on the health records of the male population in Denmark, it was determined that prevalence of tinnitus increased until the age of 70 and then it stabilized (15).

In our study prevalence rate of tinnitus in women (37.5%) was found to be significantly higher than that of men (27.4%) different from many other studies. In two studies, prevalence rate of tinnitus was more common in men than

women (12, 18). In the other studies, there was not found any gender difference. In a study held among adults in five different cities in Italy, prevalence rates of tinnitus among the men and the women were found similar (13).

It was found that hearing was a factor that increases the prevalence of tinnitus significantly (Table III). Results of all other studies performed on this subject were similar to this study. Nicolas-Puel and co-workers (19) found the level of hearing meaningfully low in patients having tinnitus. In a study in which the factors affecting the prevalence rate of tinnitus in the workers exposed to the noise were investigated, hearing level was found as the most important factor (16).

It is a known fact that working at the noisy environments may cause hearing loss. Relation between hearing loss and tinnitus again appears on this point. We also found that working at noisy environment is one of the factors that increase the prevalence of tinnitus significantly (Table III). In the study performed by Rubak and co-workers (20), it is claimed that existing noise at the working environment did not affect the prevalence rate of tinnitus, among the people having normal hearing level. Dias and co-workers (21), investigated the relation between the loss of hearing and tinnitus among the workers being exposed to noise at work and reached the conclusion that tinnitus is more common in those who have difficulty in hearing.

As tinnitus is a multifactorial complaint it was thought that it might be related to many systemic illnesses that affect various systems of the body.

Hypertension was found to be an increasing factor in terms of prevalence rate of tinnitus in this study similar to the many other studies (Table III). In a study performed on 1200 patients who were under therapy because of tinnitus, the most prevalent systemic illness in people having tinnitus was determined to be hypertension (22). Hypertension was more prevalent among the patients suffering from vertigo, tinnitus or hearing loss than the controls in the study performed by Kazmierczak and co-workers (23).

In the current study anaemia was found as another factor related to the prevalence rate of tinnitus (Table III). Ataş and co-workers (24) determined that tinnitus noticeably decreased when iron therapy was applied to the patients who have anaemia caused by iron deficiency.

In our study group tinnitus was found in 51.1 % of those reporting diabetes and 49.3 % of those reporting heart disease (Table III). But the effects of these illnesses on the prevalence rate of tinnitus were not found to be significant. The reason for the effects of these illnesses being found insignificant may be that the numbers of people who stated to have these illnesses were small. Different study results were reported in this subject too. Quaranta and co-workers (13) determined that there is an important relation between hearing disorders and cardiovascular illnesses and diabetes. In a study, one or more systemic illness was found in 34% of those having tinnitus and diabetes mellitus was in the fourth order among these systemic illnesses (22). Nevertheless Parwing (15) stated that there was no relation between hearing disorders and cardiovascular and endocrinological illnesses. Kazmierczak and co-workers (23) emphasized that diabetes is responsible for various inner ear illnesses, in their study in which they investigated metabolic disorders commonly seen in patients having tinnitus.

The present study has some restrictions. First, the study sample has included primary care patients and don't have represented general population. Prevalence rate of tinnitus in general population may be lower. Secondly, tinnitus cases were evaluated according to their statements and objective and subjective tinnitus cases couldn't be separated.

It was concluded that tinnitus is a common problem in the community. Although prevalence rate of tinnitus is affected by many factors; hearing loss, working at noisy places, hypertension, and anaemia are the situations, which the tinnitus is most commonly found together with. Working at noisy environment, anaemia and hypertension are more important preventable and changeable factors. Moreover, hearing loss is common in patients who have tinnitus.

Depending on the results of this investigation we can propose that hearing level should be evaluated in patients who have tinnitus. Tinnitus cases should also be carefully examined for hypertension and anaemia. Community based and more comprehensive studies on the prevalence of tinnitus and related factors shall help the clarification of the points, which are not clearly explained yet.

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Kaynaklar

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