Association Of Tinnitus With Depression And Anxiety In Hypertensive Patients

Maria Tabassum, Atia Ur Rehman, Tahira Ashraf, Safder Ali, Azmat Tahira, Tahira Nomani

1Department of Health Professional Technologies, University of Lahore, Pakistan
2Rashid Latif Institute of Allied Health Sciences

Abstract

**Background:** Tinnitus is a condition that can be objective or subjective. The form of tinnitus most often associated with psychosocial comorbidities is subjective tinnitus.

**Objective:** The aim of our study was to determine the association of tinnitus with depression and anxiety in hypertensive patients.

**Methodology:** It was a cross-sectional study. A total of 159 (100\%) patients with hypertension were screened for presence of tinnitus in medical outpatient department of district headquarter hospital Vehari from July 2020 to March 2021. All of them were asked to complete a standardized Tinnitus handicap inventory questionnaire (THI) to assess severity of tinnitus followed by otoscopy. Depression and anxiety were measured using the Beck depression and anxiety inventories.

**Results:** Tinnitus is strongly linked to anxiety and depression, according to the findings.

**Conclusions:** All tinnitus patients should be screened for mental illness because of the strong connection between tinnitus, depression, and anxiety. These complex disorders should be handled by a multidisciplinary team that includes cognitive behavioral treatment and likely pharmacological therapy.
Key words: Tinnitus, Anxiety, Depression. Tinnitus handicap inventory (THI), Beck depression inventory (BDI).

1. ENT Department, District Headquarter Hospital, Vehari.
2. Allied Health Sciences, Rashid Latif Medical College, Lahore.
3. PhD (scholar) Biostatician, DHPT, University of Lahore
4. Audiologist, ENT Department, Victoria Hospital, Bahawalpur.
5. Masters in Speech Language & Hearing Sciences (Scholar) DHPT, University of Lahore, Pakistan.
6. ENT Department, District headquarter Hospital, Khanewal.

Introduction:

Tinnitus is a Latin word that means "ringing" and refers to the sensation of hearing sounds in the absence of external sound. It's a medical term for any sound that people hear in one or both ears, and that originates in the middle of their brain. Various psychological and psychosomatic conditions have been related to tinnitus symptoms.\textsuperscript{1-3}

According to epidemiology reports, 15–20 percent of adult populations suffer from tinnitus, which may be temporary or permanent.\textsuperscript{4} Many people can live with chronic tinnitus, but it is a serious handicap for 1-2 percent of the population, severely reducing their quality of life.\textsuperscript{5} According to recent research, up to 77 percent of people with tinnitus may have psychological co morbidities.\textsuperscript{6, 7}

Anxiety and depression appear to be the most prevalent psychological conditions associated with tinnitus, with a lifetime incidence of depression and anxiety substantially higher in tinnitus patients than in the general population.\textsuperscript{8} There have been numerous studies examining the relationship between tinnitus and anxiety and depression around the world, but we were unable to locate any on this subject in South Punjab, Pakistan. The problem of tinnitus in Pakistan is just as disturbing and serious as it is in Western countries; however, research on the psychological profiles of people with tinnitus are scarce, and some studies in
Pakistan have attempted to uncover the connection between perceived tinnitus intensity and the degree of emotional distress of people with tinnitus.9,10

As a result, this research was carried out with the aim of determining the magnitude of tinnitus and its relationship to the severity of anxiety and depression in the adult population of this area. The findings of this study will aid in better understanding the effect of tinnitus on a patient's psychological profile, which will aid in better treating tinnitus or at the very least reducing its impact on a patient's lifestyle.

**Methods:**

In this cross sectional study, we collected data of 159 hypertensive patients from medical out patients department of district head quarter hospital Vehari, using non-probability purposive sampling technique. The sample size was calculated with the help of biostatistician. Our population size was 159, all were hypertensive. We included all the adult patients of age 25-70 years of both gender with diagnosis of hypertension. We excluded the patient having tinnitus due to diabetes, we also excluded the patients who were suffering with tinnitus due to noise induced hearing loss and impacted wax. The aim of this study was to determine the extent of tinnitus and its relationship to the incidence of anxiety and depression in this area's adult population. We used the following instrument:

Tinnitus Handicap Inventory: Tinnitus and its severity were measured with the help of tool called tinnitus handicap inventory. It was validated and reported in 1996. The tinnitus handicap was evaluated with 25 item THI questionnaire.

Beck depression Inventory: it was used to access severity of depression.

Beck anxiety Inventory: it was used to access severity of anxiety.

Research approval was taken from research committee of university of Lahore, Pakistan. Letter ref No: IRB-UOL-FAHS/716- ||/2020 dated: 28 July 2020. After taking informed consent from the population, basic demographic data were collected and they were screened by using
Tinnitus Handicap Inventory (THI) followed by otoscopy. Data was collected from July 2020 to March 2021. P-value of less than or equal to 0.05 was taken as significant.

**Statistical Analysis:**

The data was analyzed using SPSS version 20 after it was collected. Age is expressed as a Mean Standard Deviation, while categorical variables such as gender and tinnitus are expressed as a frequency and percentage. The findings were then compared to national and international literature, and conclusions were drawn.

**Results:**

Table: 1: Frequency and Percentage Table of age, gender and history of tinnitus

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>53.28 ± 10.25</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>64</td>
<td>40.3</td>
</tr>
<tr>
<td>Female</td>
<td>95</td>
<td>59.7</td>
</tr>
<tr>
<td>Do you have Tinnitus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>47</td>
<td>29.6</td>
</tr>
<tr>
<td>No</td>
<td>112</td>
<td>70.4</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>100</td>
</tr>
</tbody>
</table>

159 patients took part in this study. The mean age of patients with hypertension was 53.28 ± 10.25 years. Out of 159 patients, 64(40.3%) were male and 95(59.7%) were female. Out of 159 patients 29.6% had tinnitus. (Table: 1)
The mean THI score was 13.19 ± 21.11 with minimum and maximum scores reported as 0.00 and 82.00 respectively. Out of 159 participants 70.4% did not have tinnitus, 5% had mild tinnitus, 23.9% showed moderate tinnitus while 0.6% showed catastrophic tinnitus. (Table 2).

Table: 3: Crosstab between Tinnitus and anxiety

<table>
<thead>
<tr>
<th>Category</th>
<th>category</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>low anxiety</td>
<td>moderate anxiety</td>
</tr>
<tr>
<td>NA</td>
<td>% within category</td>
<td>110(98.2%)</td>
</tr>
<tr>
<td>Mild</td>
<td>% within category</td>
<td>8(100.0%)</td>
</tr>
<tr>
<td>Moderate</td>
<td>% within category</td>
<td>28(73.7%)</td>
</tr>
</tbody>
</table>
Out of all the patients who had mild tinnitus 100% have low anxiety. Out of all patients who had moderate tinnitus 73.7% have low anxiety and 26.3% have moderate anxiety. Out of all patients who had catastrophic tinnitus 100% have low anxiety. (Table: 3)

There was significant association between stages of tinnitus and severity of anxiety

Table: 4: Crosstab Between Tinnitus and Depression

<table>
<thead>
<tr>
<th>Category</th>
<th>Category</th>
<th>Normal N (%)</th>
<th>Mild % within category</th>
<th>Borderline clinical depression</th>
<th>Moderate % within category</th>
<th>Severe % within category</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>% within category</td>
<td>84(75.0%)</td>
<td>26(23.2%)</td>
<td>1(9.9%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
<td>1(9%)</td>
</tr>
<tr>
<td>Mild</td>
<td>% within category</td>
<td>2(25.0%)</td>
<td>1(12.5%)</td>
<td>2(25.0%)</td>
<td>3(37.5%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td>Moderate</td>
<td>% within category</td>
<td>1(2.6%)</td>
<td>8(21.1%)</td>
<td>10(26.3%)</td>
<td>18(47.4%)</td>
<td>1(2.6%)</td>
<td>0(0%)</td>
</tr>
</tbody>
</table>
Out of all the patients who had mild tinnitus 12.5% have mild depression, 25% have borderline clinical depression, and 37.5% have moderate depression. Out of all the patients who had moderate tinnitus 21.1% have mild depression, 26.3% have borderline clinical depression, 47.4% have moderate depression and 2.6% have severe depression. Out of all patients having tinnitus, 22% have mild depression, 8.2% have borderline clinical depression, 13.2% have moderate depression and 0.6% has severe depression. There was significant association between stages of tinnitus and severity of depression. (Table: 4)

**Discussion:**

Tinnitus is strongly linked to anxiety and depression, according to our findings. THI was used to measure tinnitus in our research. Beck anxiety and depression inventories were used to evaluate anxiety and depression, respectively. Our results showed tinnitus is highly significant with depression and anxiety. While in another research Tinnitus severity ratings were found to be closely associated with psychological distress by Fagelson et al., 2007 suggesting that it may exacerbate mental illness.\(^\text{11}\)
In a study conducted in the United States, Folmer et al. (2008) looked at the connection of tinnitus severity and measures of anxiety, depression, and obsessive compulsiveness. They discovered that the magnitude of tinnitus was linked to quantitative anxiety and depression tests.\(^{12}\) In another study, Zoger et al., 2006 discovered a connection among the degree of tinnitus and the severity of anxiety and depression.\(^{13}\) Ziai et al., 2010 concluded in a recent review of 56 abstracts that there is growing evidence linking tinnitus to depression and anxiety.\(^{14}\)

According to et Unterrainer et al., 2003 Comorbid depression was found to be a better predictor of perceived tinnitus intensity than length, pitch, locus of influence, or the experience of tinnitus as a disorder.\(^{2}\) Zeman et al., 2014 used the THI questionnaire to replicate this observation, highlighting the THI's utility as a screening tool for co-morbid depression and anxiety.\(^{15}\)

In the adult patient population, studies showed a strong connection between tinnitus and psychological co morbidities. Tinnitus and psychiatric co morbidities were found to be related in all of the studies. The involvement of a subject with a psychiatric co morbidity increased as the incidence of tinnitus increased.\(^{16}\)

**Conclusion:**

Our results concluded that anxiety and depression are highly associated with tinnitus. For many patients, tinnitus is a very bothersome symptom, and it is preferable to seek care as soon as possible to reduce its effect on quality of life. However, there were significant association between stages of tinnitus and severity of depression and anxiety.

**Recommendations:**

It is recommended to conduct more studies on prevalence of tinnitus and see how its effect mental health. This may be a good starting point for further study, as well as preparing prevention and rehabilitation strategies. These complex disorders should be handled by a
multidisciplinary team that includes cognitive behavioral treatment and likely pharmacological therapy.

Conflict of interest: None

Source of Funding: Self

References: