

Psychological Evaluation of Patients Referred with Diagnosis of Psychogenic Tinnitus to Psychiatry Out Patient Department in Tertiary Care Hospital of North India

Pankaj Gupta¹, Nitesh Kumar Singh², Jai Singh Yadav³

¹Assistant Professor, Psychiatry, Institute of Medical Sciences, BHU, Varanasi

²Senior Resident, Psychiatry, Institute of Medical Sciences, BHU, Varanasi

³Professor, Psychiatry, Institute of Medical Sciences, BHU, Varanasi

Corresponding Author: Nitesh Kumar Singh

ABSTRACT

Introduction- Tinnitus is perceived as a continuous buzzing, hissing or ringing in the ears and in some cases in head. One of common cause of subjective tinnitus is psychogenic. The high prevalence of anxiety and depression in patients of tinnitus warrants a review of literature to shed light on the link between these diseases. Despite theoretical suggestions of a link between stress and tinnitus, this notion has received little empirical support. We conducted this study with aim to find out the psychological factors in patients suffering from psychogenic tinnitus.

Methodology- Fifty patients with diagnosis of psychogenic tinnitus referred to psychiatry outpatient department underwent detailed psychiatric evaluation by a consultant psychiatrist. Psychiatric diagnoses were considered as per ICD-10 DCR criteria. Hamilton Depression rating scale (HAM-D) was used to assess Depressive symptoms and Hamilton Anxiety Rating scale (HAM-A) was used to assess anxiety symptoms. Perceived Stress scale (PSS) was used to assess the perception of stress. Visual Analog Scale (VAS) was used to assess the severity of Tinnitus. The statistical analyses were conducted using Statistical package for the social sciences (SPSS version 16) software.

Results- Majority of patients reported difficulty in falling asleep (28%), Dizziness was reported by 20% of patients, 20% reported Headache, 16% reported Irritability, 8% reported difficulty in concentrating due to tinnitus, 3% patients

were fearful about their illness. Most common psychiatric diagnosis in our study was anxiety disorders (18%), followed by Depressive disorder (14%). 3 (6%) Tinnitus patients also suffered from Somatoform Disorders. Correlation analysis showed significant correlation between visual analog scale annoyance, coping, distress, loudness scores and perceived stress scores

Conclusion- This study has revealed significant psychological stress and psychiatric comorbidity associated with psychogenic tinnitus patients. Stress can be particularly related to aetiology as well as morbidity of psychogenic tinnitus.

Keywords- Tinnitus, psychiatric comorbidity, HAM-D, HAM-A, Stress

INTRODUCTION

Tinnitus is perceived as a continuous buzzing, hissing or ringing in the ears and in some cases in head. Traditionally Tinnitus is defined as 'the perception of sound in the ears or the head without the presence of an external source generating that sound'¹. It affects 5.1-42.7% of general population². It can be subjective and objective type with former more common and difficult to assess by train Audiologist. One of common cause of subjective tinnitus is psychogenic. Tinnitus affects three domains (acoustic, emotional and cognitive). The acoustic domain is very well studied in many researches but the other two domains need more explorations in terms of distress they

caused and improvement in overall status of patient after treatment centric to them also. The psychopathologic distress caused by tinnitus is mainly due to its unwanted nature and continuous presence. The subjective awareness of tinnitus affects patient attention concentration and disturbs sleep that may leads to emotional disturbances. The distress gets increased with chronicity of illness³. A study found that 90% of chronic sufferer complains of poor sleep, social withdrawal and difficulty in focusing on work and 70% reported emotional disturbances in form of worry, confusion and suicidal thoughts⁴. Another study found depression and anxiety are the most common presentations⁵. Sleep disturbances are second most common type according to another study⁶. Between 30 and 60% of tinnitus patients report significant depressive symptoms⁷. The tinnitus severity has been found to correlate with depressive symptoms in a consistent manner⁸. A study found that life time prevalence of anxiety disorder in patients of tinnitus is 45%⁹. With each of these disorders being reported as an independent disease processes, the possibility of these existing as comorbid conditions has been brought to the forefront. The high prevalence of tinnitus, anxiety and depression, warrants a review of literature to shed light on the link between these diseases. Stress is widely acknowledged as a predisposing and precipitating factor in different neurological and psychiatric illnesses. Despite theoretical suggestions of a link between stress and tinnitus^{10,11}, this notion has received little empirical support. Schmitt et al. reported that inpatients with tinnitus and sudden hearing loss had a higher number and greater stressfulness of events relative to a clinical Control group¹². Subjective anxiety, perceived stress and tinnitus disturbance, as well as TNF- α , a stress-related immunological parameter, decreased in patients with tinnitus after a relaxation program, indirectly support the notion that stress plays important role in tinnitus¹³. These studies suggest, along with clinical observations, that stress levels may

modulate tinnitus. Considering the above literatures, we conducted this study with aim to find out the psychological factors in patients suffering from psychogenic tinnitus.

MATERIAL AND METHODS

This cross-sectional descriptive study was based on the detailed psychological evaluation of the fifty patients with diagnosis of psychogenic tinnitus referred to psychiatry outpatient department of Sir Sunder Lal Hospital, Institute of Medical sciences, Banaras Hindu University, Varanasi a premier tertiary care hospital situated at northern part of India, covering and serving a large catchment area. Detailed History related to tinnitus onset, duration, aggravating and relieving factors, associated psychological complaints (Insomnia, Headache, dizziness etc), systemic illness, drug history, occupational history was taken. After proper informed consent these patients were assessed by psychiatrist for any psychiatric symptom. Detailed mental status examination was done. If met diagnosis of comorbid mental illness was made according to The International classification of Diseases (ICD- 10 DCR). Hamilton Depression rating scale (HAM-D) (HDRS) was used to assess Depressive symptoms and Hamilton Anxiety Rating scale (HAM-A) was used to assess anxiety symptoms. Perceived Stress scale (PSS) was used to assess the perception of stress. Visual Analog Scale (VAS) was used to assess the severity of Tinnitus.

Hamilton Depression rating scale (HDRS) – also known as HAM-D is a most widely used clinical administered scale for assessment of depression. The original version contains 17 items pertaining to symptoms of depression experienced over the last week. A Score of 0-7 is generally accepted to be within the normal range, while a score of 20 or higher indicate clinical Depression. Score 8-13 indicate mild, 14-18 indicate moderate, 19-22

indicate severe more than 23 indicate very severe Depression¹⁴.

Hamilton Anxiety Rating scale (HAM-A) - The HAM-A is one of the first scales developed to assess symptoms of anxiety disorder and most widely used in both clinical and research setting. The scale consists of 14 items pertaining to psychological and physical complaints related to anxiety. Each item is scored on a scale of 0 (not present)-4 (severe), with a total score ranging from 0-56. Total score less than 17 indicates mild, 18-24 indicates moderate and 25-30 indicates severe anxiety¹⁵.

Perceived Stress scale (PSS)- PSS is the most widely used scale to measure perception of stress. It is measure of the degree to which situation in one's life are appraised as stressful. It has 10 items scored on scale 0 (Never) - 4 (most often). Total Score Ranges from 0-40 with higher scores indicating higher perceived stress. Total score ranging from 0-13 would be considered low stress, 14-26 moderate stress, 27 - 40 high perceived stress¹⁶.

Visual Analog Scale (VAS)¹⁷- A VAS is a rating scale in which the subject rates severity of symptoms subjectively and places a corresponding mark along a printed line. VAS as a tool allow the clinician to quickly gauge the loudness of tinnitus, its annoyance, the distress it is causing, and how well the patient is coping with the condition. 4-component VAS measures tinnitus loudness (VAS-L), annoyance (VAS-A), distress (VAS-D), and how well the patient was coping with the problem (VAS-C). The purpose and use of the VAS were explained to the patients. The idea of a VAS is that it gauges a subjective reaction based on a line with defined end points. For example, the end points for measuring tinnitus loudness (VAS-L) are set as "inaudible" at one end and "extremely loud" at the other. For tinnitus annoyance (VAS-A), the end points are designated "not annoying" and "extremely annoying." Similarly, tinnitus distress (VAS-D) uses the end points "not distressing" and "extremely

distressing." Finally, to measure how well the patient is coping with their tinnitus, the VAS-C scale ranges from "coping with tinnitus without problems" to "not coping with tinnitus at all". The ratings of inaudible, not annoying, not distressing, and coping with tinnitus without problems occupied the left side of the form, and the opposite situation, where the tinnitus was rated as extremely loud, extremely annoying, extremely distressing, and not coping with tinnitus at all, occupied the right side of the form. Patients were asked to put a mark on the line (100 mm long) between these extremes to represent how strongly they rated their tinnitus. The mark was usually placed somewhere between the end points to indicate an intermediate rating. When analyzing the results, marks on the left were scored as 0, while marks on the right were scored as 100. All statements referred to the patient's experience during the previous week

The statistical analyses were conducted using Statistical package for the social sciences (SPSS version 16) software.

RESULT

In our study 50 patients were included in which 60 % were males and 40 % were females (Table-1). The reason behind it may be that males are more exposed to noise pollution. Their age group range from 18 years to 42 years, mean age of our study group was 29 years. The sample is not representative of general population. The Socio-demographic characteristics of the subjects are presented in table 1.

Majority of the subjects were married, living in Nuclear Family residing in Urban area. Majority of the patients were Employed and belonged to upper lower or Middle socioeconomic status.

Most of the patient have steady tone and steady noise followed by ringing, buzzing, hissing, hmm, pulsating, roaring, etc. Patient may describe it as mild, annoying, troublesome, irritating, nagging, etc. On evaluation by psychiatrist, majority

of patients reported difficulty in falling asleep (28%), Dizziness was reported by 20% of patients, 20% reported Headache, 16% reported Irritability, 8% reported difficulty in concentrating due to tinnitus, 3% patients were fearful about their illness (Table-2). Many patients were worried and desperate to get relieved from it. As shown in Table -2, most common psychiatric diagnosis in our study was anxiety disorders (18%), followed by Depressive disorder (14%). 3 (6%) Tinnitus patients also suffered from Somatoform Disorders. In our subjects tobacco was most common substance abused (28%) followed by alcohol (6%).

Table1. Socio- Demographic data of subjects

Variable	Number	Percentage
SEX		
Male	37	60%
Female	13	40%
Marital Status		
Single/Divorced	20	40%
Married	30	60%
Family Type		
Nuclear	31	62%
Joint	19	38%
Residence		
Rural	11	22%
Urban	39	78%
Occupational Status		
Unemployed	19	38%
Employed	31	62%
Education		
Primary	1	2%
High	11	22%
Inter	13	26%
Graduate	18	36%
Postgraduate	7	14%
Socio Economic Status		
Lower	3	6%
Upper Lower	22	44%
Middle	21	42%
Upper Middle	4	8%

Hamilton Depression rating scale showed that significant proportion (40%) of patients were suffering from mild depressive symptoms and 14% were having moderate to severe depressive symptoms. Proportion of patients suffering from mild anxiety symptoms was 54%, moderate to severe anxiety symptoms was also high (32%).

Table 5- Correlation between Tinnitus severity (VAS scores) and perceived stress (PSS scores)

	VAS Coping	VAS Annoyance	VAS Distress	VAS Loudness
PSS score (Pearson correlation)	.821*	.657*	.801*	.701*

*correlation is significant at the .001 level (2- tailed)

86% of patients had perceived moderate to high level of stress (Table-3).

Table2- Clinical characteristic of subjects

Psychological Complaints	Number	Percentage
Sleep disturbance	28	56%
Dizziness	10	20%
Irritability	8	16%
Headache	10	20%
Difficulty in concentration	4	8%
Illness Anxiety	3	6%
Psychiatric Diagnosis	Number	Percentage
Depressive Disorder	7	14%
Anxiety Disorder	9	18%
Somatoform Disorder	3	6%
Nil	31	62%
Substance Abuse		
Tobacco	14	28%
Alcohol	3	6%

Table 3- HAM-D, HAM-A & PSS Score

HAM-D score	Number	Percentage
Mild	20	40%
Moderate	5	10%
Severe	2	4%
HAM-A Score		
Mild	27	54%
Moderate	13	26%
Severe	4	8%
PSS Score		
Low	7	14%
Moderate	32	64%
High	11	22%

Mean HAM-D, HAM-A and PSS scores are shown in table-4. Mean score for Tinnitus Visual Analog Scale annoyance was 59.24, for coping it was 65.18, for distress 59.98, for loudness it was 59.82 (table- 4). So majority of patients were having troublesome tinnitus with maximum difficulty in coping with the tinnitus. Correlation analysis showed significant correlation between visual analog scale annoyance, coping, distress, loudness scores and perceived stress scores (Table-5).

Table- 4. Mean tinnitus , depression , anxiety and stress scores

	N	Mean	Std. Deviation
VASA Annoyance	50	59.24	8.03
VASC coping	50	65.18	8.94
VASD Distress	50	59.98	8.00
VASL loudness	50	59.82	7.63
HAMD	50	9.10	4.48
HAMA	50	15.08	5.38
PSS	50	20.42	7.03

DISCUSSION

Subjective tinnitus is by far the most common form of tinnitus². Subjective tinnitus is a common and distressing symptom that is characterized by the perceived sensation of sound in the absence of a corresponding external stimulus. Subjective tinnitus is only perceivable to the patient, and there is no corresponding sound source, in contrast to objective tinnitus, where the perceived noise has its source within the patient's body. Tinnitus is clinically heterogeneous, with respect to its etiology, perceptual characteristics and accompanying symptoms. We examined 50 patients of subjective tinnitus, where patient's tinnitus cannot be attributed to otologic disorders, for psychiatric disorder and psychological distress. In addition to general irritation and annoyance with the sound, many patients in our study reported sleep disturbances (28%), Dizziness (20%), Headache, Irritability & difficulty in concentrating due to tinnitus. Our findings are in line with other studies, Sleep disturbance and insomnia are commonly reported by patients with tinnitus, along with annoyance and difficulty in concentration⁴. Most common psychiatric diagnosis in our study was anxiety disorders (18%), followed by Depressive disorder (14%). Many studies have found high comorbidity of tinnitus with anxiety and depressive disorder. Trevis et al. evaluated 81 patients with chronic tinnitus for depression and anxiety disorders. Of the study cohort, 28% of patients suffered from depression and 95% of patients suffered from anxiety disorders¹⁸. Bhatt et al. conducted a cross-sectional analysis using a national health survey. It was determined that there is a high prevalence of depression (25.6%) and anxiety (26.1%) in those with tinnitus¹⁹. There is a large discrepancy between the rate of depression (9.8-90%) and anxiety disorders (10.2-95%)²⁰ that can be attributed to different measures and scales used to classify the patients in different studies. In our study diagnosis of anxiety and depression was based on mental

status examination done by qualified Psychiatrist whereas in majority of previously done studies diagnosis of anxiety and depression is made on the basis of various scales. In our study also Hamilton Depression rating scale showed that significant proportion of patients were suffering from mild depressive symptoms (40%) and 14% were having moderate to severe depressive symptoms. Proportion of patients suffering from mild anxiety symptoms was 54%, moderate to severe anxiety symptoms was also high (32%). Another important finding in our study is high level of perceived stress among patients. Similarly, many clinicians relate tinnitus onset and maintenance not only to cochlear mechanisms, but also to stress. Despite the suggestion of a link between stress and tinnitus, there is little empirical support for this idea to date. Our study showed significant correlation between tinnitus severity measured by visual analog scale in term of annoyance, loudness, distress, coping and perceived stress measured by perceived stress scale (Table-5). Several issues are discussed in the association of tinnitus and stress. Stress may be a predisposing risk factor for tinnitus²¹. In-patients with tinnitus indicated more stress than a normative healthy control group and reported more frequent and more stressful life events than a clinical control group²². Stress also seems to be an important factor in the transition from mild to severe tinnitus²³. Cognitive maladjustment to stressful situations could favour tinnitus onset and maintenance²⁴. In accordance, tinnitus patients used more maladaptive coping strategies than a clinical control group²⁵. Tinnitus symptoms themselves may act as a stressor, resulting in higher general physiological arousal and psychological distress. Personality factor associated with increased experienced levels of anxiety, sadness, embarrassment, and guilt, has also been identified as a risk factor for tinnitus severity¹⁸.

Limited sample size is one of the limitations of our study. In our study we

only included the cases of psychogenic tinnitus but Stress and other psychological factors are also relevant in other types of tinnitus. We used well validated specialized scales for assessment of Depression, anxiety and stress. Psychiatric diagnosis was made after detailed evaluation by qualified psychiatrist. Although majority of patients did not meet the criteria for any psychiatric diagnosis when Stress was independently assessed it came out to be important factor associated with Tinnitus severity.

CONCLUSION

This study has revealed significant psychological stress and subclinical depressive and anxiety associated with Psychogenic Tinnitus patients causing significant distress. There is a need for detailed psychological evaluation of every tinnitus patients. Management of the associated psychological stressors and distress is important for improvement in tinnitus patients. Psychosocial intervention strategies should be planned, which could aid Tinnitus patients to cope with their psychosocial challenges leading to improved treatment outcome.

Financial Support and Sponsorship: Nil

Conflict of interest: There is no conflict of interest

REFERENCES

1. McFadden, D. (1982). Tinnitus: Facts, Theories, and Treatments. Washington, DC: National Academy Press.
2. McCormack, A., Edmondson-Jones, M., Somerset, S., and Hall, D. (2016). A systematic review of the reporting of tinnitus prevalence and severity. *Hear Res.* 337, 70–79.
3. Jana Milerová, Martin Anders, Tomáš Dvořák, Philipp G. Sand, Stefanie Königer, Berthold Langguth. (2013) The influence of psychological factors on tinnitus severity. *General Hospital Psychiatry*. Volume 35, Issue 4, July–August 2013, Pages 412-416.
4. Tyler, R.S., Baker, L.J., 1983. Difficulties experienced by tinnitus sufferers. *J. Speech Hear. Disord.* 48, 150–154.
5. Zöger S, Svedlund J, Holgers KM. Relationship between tinnitus severity and psychiatric disorders. *Psychosomatics* 2006; 47:282–8.
6. Folmer, R. L., Griest, S. E., Meikle, M. B., & Martin, W. H. (1999). Tinnitus severity, loudness, and depression. *Otolaryngology-Head and Neck Surgery*, 121(1), 48–51. doi:10.1016/s0194-5998(99)70123-3
7. Folmer, Robert & Griest, Susan. (2000). Tinnitus and Insomnia. *American journal of otolaryngology*. 21. 287-93. 10.1053/ajot.2000.9871.
8. Langguth, B. (2011). A review of tinnitus symptoms beyond “ringing in the ears”: a call to action. *Current Medical Research and Opinion*, 27(8), 1635–1643. doi:10.1185/03007995.2011.595781.
9. Zoger S, Svedlund J, Holgers KM. Psychiatric disorders in tinnitus patients without severe hearing impairment: 24 month follow-up of patients at an audiological clinic. *Audiology* 2001;40:133-40
10. D. Alpini, A. Cesarani, Tinnitus as an alarm bell: stress reaction Tinnitus model, *ORL J. Otorhinolaryngol. Relat. Spec.* 68 (2006) 31–36.
11. K.C. Horner, The emotional ear in stress, *Neurosci. Biobehav. Rev.* 27 (2003) 437–446.
12. C. Schmitt, M. Patak, B. Kröner-Herwig, Stress and the onset of sudden hearing loss, *Int. Tinnitus J.* 6 (2000) 41–49.
13. C. Weber, P. Arck, B. Mazureck, B.F. Klapp, Impact of a relaxation training on psychometric and immunologic parameters in tinnitus sufferers, *J. Psychosom. Res.* 52 (2002) 29–33.
14. Hamilton M. A rating scale for depression. *Journal of neurology, neurosurgery, and psychiatry.* 1960 Feb;23(1):56.
15. Hamilton M. The assessment of anxiety states by rating. *Br J Med Psychol* 1959; 32:50–55.
16. Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.
17. Raj-Koziak, D., Gos, E., Swierniak, W., Rajchel, J. J., Karpiesz, L., Niedzialek, I., Skarzynski, P. H. (2018). Visual Analogue Scales as a Tool for Initial Assessment of Tinnitus Severity: Psychometric Evaluation in a Clinical Population. *Audiology and*

- Neurotology, 229–237.
doi:10.1159/000494021
18. Trevis KJ, McLachlan NM, Wilson SJ. Psychological mediators of chronic tinnitus: The critical role of depression. *J Affect Disord.* 2016;204:234-40.
 19. Bhatt JM, Bhattacharyya N, Lin HW. Relationships between tinnitus and the prevalence of anxiety and depression. *Laryngoscope.* 2017;127(2):466-9.
 20. Ziai K, Moshtaghi O, Mahboubi H, Djalilian HR. Tinnitus Patients Suffering from Anxiety and Depression: A Review. *Int Tinnitus J.* 2017; 21(1): 68-73
 21. Canlon, B., Theorell, T. & Hasson, D. Associations between stress and hearing problems in humans. *Hearing Research* 295, 9–15(2013).
 22. Sahley, T. L. & Nodar, R. H. A biochemical model of peripheral tinnitus. *Hearing Research* 152, 43–54 (2001).
 23. Schmitt, C., Patak, M. & Kröner-Herwig, B. Stress and the onset of sudden hearing loss and tinnitus. *International Tinnitus Journal* 6, 41 (2000).
 24. Baigi, A., Oden, A., Almlid-Larsen, V., Barrenäs, M.-L. & Holgers, K.-M. Tinnitus in the general population with a focus on noise and stress: a public health study. *Ear and Hearing* 32, 787–789 (2011).
 25. Hallam, R. S., Jakes, S. C. & Hinchcliffe, R. Cognitive variables in tinnitus annoyance. *British Journal of Clinical Psychology* 27,213–222 (1988).

How to cite this article: Gupta P, Singh NK, Yadav JS. Psychological evaluation of patients referred with diagnosis of psychogenic tinnitus to psychiatry out patient department in tertiary care hospital of north India. *International Journal of Research and Review.* 2020; 7(1): 578-584.
