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## **Tinnitus in elderly rural population of Salem district Tamilnadu**

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**Abstract**--Background: Most patients with both tinnitus and hearing loss report that the frequency of the tinnitus correlates with the severity and frequency characteristics of their hearing loss, and that the intensity of the tinnitus is usually less than 10 dB above the patient's hearing threshold at that frequency. Some patients who have central auditory processing disorders and have difficulties understanding speech in noise report experiencing tinnitus even though their pure-tone audiometric thresholds are normal. Less prevalent forms of tinnitus, such as those involving well-known musical tunes or voices without understandable speech, occur among older people with hearing loss and are believed to represent a central type of tinnitus involving reverberatory activity within neural loops at a high level of processing in the auditory cortex. Methodology: Present study is a longitudinal study conducted at ENT OPD, VMKV MEDICAL COLLEGE AND HOSPITAL, SALEM among 500 patients attending ENT OPD for complaints of tinnitus for a period of 2 years. Data entry and analysis: Data collected was entered in Microsoft excel and analyzed using SPSS version 20.0. Qualitative variables were expressed in percentage and Quantitative variables were expressed in mean and standard deviation. Results: In the present study majority of the study population (58%) belonged to age of 41 to 60 years. Only 6% belonged to age 10 to 20 years. About 64% were males. About 56% of tinnitus is due to infections. About 24% is due to prolonged noise exposure and 20% is due to head and neck injury. About 76% were subjective tinnitus. About 64% had sensorineural hearing loss. Conclusion: More studies are to be conducted in future to understand the pathogenesis and take necessary preventive measures.

**Keywords**--tinnitus, Meniere's illness, elderly rural population.

## Introduction

Tinnitus is an auditory symptom most commonly occurs bilaterally and is often associated with hearing loss. It may be described as the presence of constant or pulsating high or low frequency sounds or sometimes more complicated sounds. The sound level may vary from being barely noticeable to very disturbing, and this perception varies both between and within individuals over time. Tinnitus is a phantom auditory experience, or a perception of sound in the cochlea that has no matching acoustic or mechanical correlates.<sup>1</sup> Tinnitus is one of the most prevalent and distressing otologic issues, and it can lead to a variety of physical and psychological issues that can negatively impact one's quality of life.<sup>2</sup> Tinnitus was found to be 8.2% prevalent at baseline and 5.7 percent over a 5-year follow-up in a population-based investigation of hearing loss in persons aged 48 to 92 years.<sup>3</sup> Tinnitus becomes more common as people get older.<sup>4</sup>

Tinnitus is also a typical symptom among youngsters who have lost their hearing.<sup>5</sup> Tinnitus is a subjective condition that is difficult to assess objectively, with only patient reactions being used to measure, quantify, and explain it. Tinnitus can be caused by a variety of factors, although it is most usually caused by otologic problems, with noise-induced hearing loss being the most common cause.<sup>6</sup> Because the many therapeutic methods to tinnitus have had inconsistent success, it is widely accepted that tinnitus has a variety of physiological reasons.<sup>7</sup> Tinnitus is classified into two types: objective and subjective tinnitus. Tinnitus that is audible to another person as a sound emanating from the ear canal is defined as objective tinnitus, whereas subjective tinnitus is audible only to the patient. Many doctors refer to subjective tinnitus as tinnitus, but objective tinnitus is referred to as somatosound. Most cases of tinnitus have been reported as sounding like cicadas, crickets, winds, falling tap water, grinding steel, escaping steam, fluorescent lights, running motors, and so on. These perceptions are thought to be the outcome of aberrant neuronal activity in the auditory pathway's subcortical level.<sup>8</sup>

Tinnitus has a pattern that is tied to the library of patterns stored in auditory memory and also correlated with emotional states via the limbic system.<sup>9</sup> Tinnitus features are usually independent to the type or severity of any accompanying hearing loss, hence the latter has limited diagnostic significance. The majority of tinnitus sufferers associate their tinnitus with a frequency exceeding 3 kHz.<sup>10</sup> Meniere's disease tinnitus is described as roaring and corresponds to a low-frequency tone between 125 and 250 Hz.<sup>11</sup> Tinnitus in the advanced "burned-out" stage of Meniere's illness, on the other hand, is frequently higher in pitch and tonal quality.<sup>12</sup> Most patients with both tinnitus and hearing loss report that the frequency of the tinnitus correlates with the severity and frequency characteristics of their hearing loss, and that the intensity of the tinnitus is usually less than 10 dB above the patient's hearing threshold at that frequency. Some patients who have central auditory processing disorders and have difficulties understanding speech in noise report experiencing tinnitus even though their pure-tone audiometric thresholds are normal.<sup>13</sup> To the best of our knowledge more research has not been done on tinnitus in south India. Hence the present study is conducted with following objectives.

## Objectives

1. To evaluate the prevalence of tinnitus among patients attending ENT OPD
2. To find out the most common pathology
3. To analyze the characteristics of tinnitus in patients
4. To determine associated hearing loss

## Methodology

This is a Longitudinal study done among the patients who attended ENT OPD with complaints of Tinnitus at Vinayaka Missions KirupanandaVariyar Medical College and Hospital, Salem. All the cases of tinnitus between the age group 10years-80years were included in the study. Patients with history of previous surgery and Patients who were already on treatment on 1st presentation were excluded. The sample size was calculated using the formula  $4PQ/12$  using the prevalence from the study done by Laskar HA et al.<sup>19</sup> After applying the formula with 5% precision the sample size was 389 and with 10% allowable error rounded off to 500. The study participants were selected using Consecutive sampling method (simple random sampling method). Data collected was entered in Microsoft excel and analysed using SPSS version 20.0. Qualitative variables were expressed in percentage and Quantitative variables were expressed in mean and standard deviation.

## Results

Table 1: Age wise distribution of study participants

Age in years	Frequency	Percentage	Mean $\pm$ SD
10-20	28	6	56.6 $\pm$ 11.26
21-40	70	14	
41-60	290	58	
61-80	112	22	
Total	500	100	

Table 2: Sex wise distribution of study participants

Sex	Frequency	Percentage
Male	320	64
Female	180	36
Total	500	100

Table 3: Distribution of pathology of tinnitus

Pathology	Frequency	Percentage
Prolonged noise exposure	120	24
Head / neck injury	100	20
Infections	280	56
Total	500	100

Table 4: Characteristics of tinnitus

Characteristics	Frequency	Percentage
Objective	120	24
Subjective	380	76
Total	500	100

Table 5: Distribution of associated hearing loss

Sensory neural Hearing loss	Frequency	Percentage
Yes	320	64
No	180	26
Total	500	100

Table 6: Pattern of sensorineural hearing loss among study participants

Pattern	Frequency	Percentage
Noise induced	100	
Presbycusis	220	
Total	320	100

Table 7: Distribution of treatment among study participants

Treatment	Frequency	Percentage
Hearing aid	100	
TRT	20	
Cognitive therapy	12	
Nil	188	
Total	320	100

Figure 1: Age wise distribution of study participants

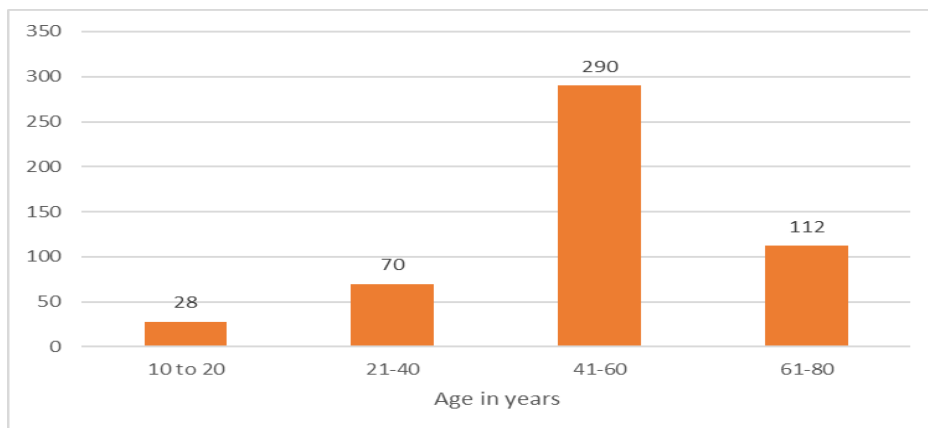


Figure 2: Sex wise distribution of study participants

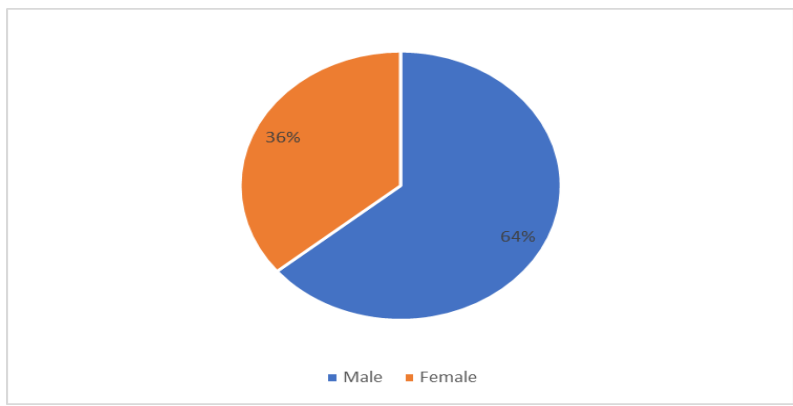


Figure 3: Distribution of pathology of tinnitus

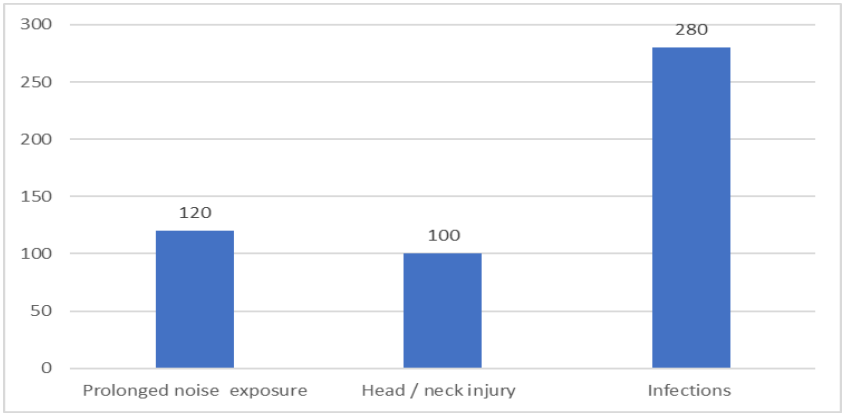


Figure 4: Characteristics of tinnitus

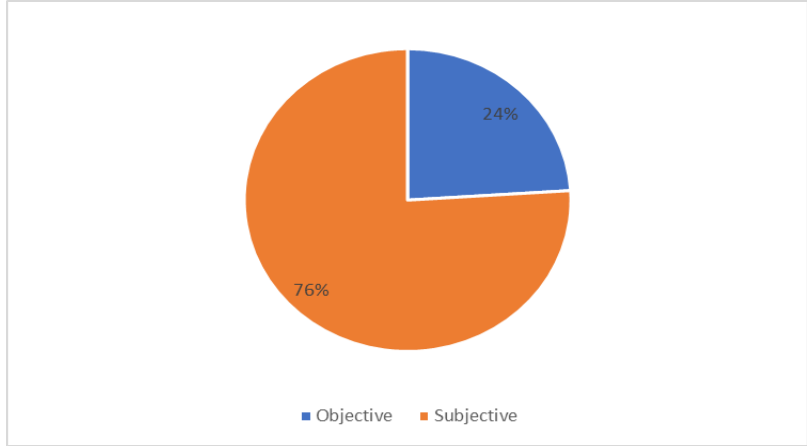
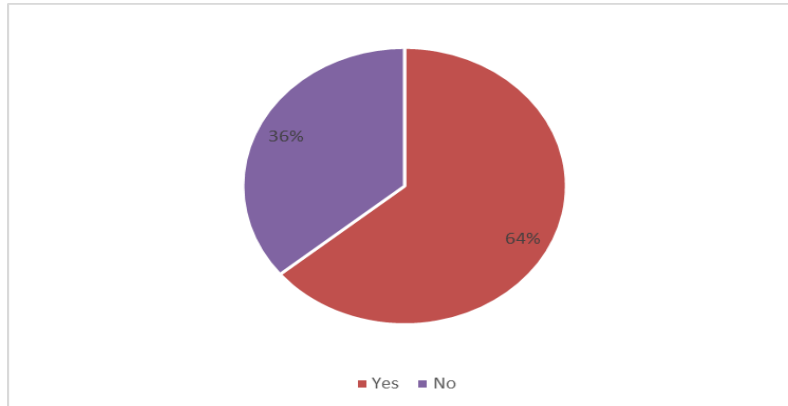


Figure 5: Distribution of associated hearing loss



### Results and Discussion

Among the subjects who were taken in for the study (58%) belonged to the age group ranging between 41 and 60. 6% of the participants were between the ages of 10 and 20. Males made up about 64% of the population. 56% of tinnitus cases were due to infection, prolonged noise exposure is responsible for 24% of the cases 20% is due to head and neck injury. Subjective tinnitus accounted for almost 76% of the cases. Sensory neural hearing loss affected 64% of the participants. Tinnitus may be a very debilitating condition, and there are a number of risk factors that have been linked to the development of tinnitus<sup>3</sup>. The results from the study show that men (64%) reported tinnitus more than women, which is consistent with previous research<sup>3, 5</sup>. 24% of the study subject were exposed to loud noise and various studies done among the tinnitus subjects also proves that loud noise has regularly been related to an increased risk of hearing loss.

The findings from the study also shows that the highest (56%) of the tinnitus cases were due to infection whereas other previous studies shows it is either due to exposure of loud noise and due to head and neck injury. In contrast to the findings from previous studies the findings from the study says that only 20% of tinnitus is caused due to head and neck injury whereas findings from earlier study states that hearing loss and head injury were linked to higher occurrence of tinnitus. Tinnitus is more common in people who have hearing loss, and the increased risk varies depending on the severity of the hearing loss<sup>3</sup>. Our study has several strength and limitations. Rather of focusing solely on the elderly, this study looked at people of all ages. This two-year longitudinal research assisted in tracking the progress of the patients. The study's weakness is that it was more of a hospital-oriented study with a smaller sample size than an epidemiological study. Only a few causes of tinnitus were researched. The exact cause of the tinnitus could not be determined because the patients' occupations were not monitored.

## Conclusion

Tinnitus frequently represents a symptom of an associated disease process. Recent research has employed state-of-the-art imaging and measurement technology to examine tinnitus-related activity in the ear, auditory nerve, and auditory tracts of the brain. These studies have increasingly focused on exploring putative brain-related mechanisms. The complexity of the changes in the nervous system associated with tinnitus might explain why this condition has proved so resistant to treatment. Although numerous therapeutic modalities have been applied, no consensus regarding effective therapeutic agents has emerged. At times, no treatment represents the better alternative, mandating that clinicians are able to placate patients without resorting to unnecessary prescriptions.

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