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Research Article

EPIDEMIOLOGICAL PATTERN OF TINNITUS IN EKITI

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ABSTRACT

Objective: Tinnitus is common otological symptoms yet the aetiopathogenesis is poorly understand and poorly managed.

This study aimed at determining the prevalence, sociodemographic features, aetiology, comorbidity and its impact upon quality of life in patients with tinnitus in the studied population.

Methods: This prospective study of patients diagnosed of tinnitus was carried out in the Ear, Nose and Throat Department of Ekiti state university teaching hospital, Ado Ekiti between March 2012 and February 2017.

Interviewer assisted questionnaire was used to document the biodata, history of tinnitus associated medical illnesses, sociodemographic profile and complete clinical examination including Hearing assessment, weight and blood pressure. Data obtained were collated and analyzed using SPSS version 16. The data were expressed in table, bar chart and pie chart.

The study had ethical clearance from the Institution and informed consented was obtained from the subjects.

Results: A total of 5,221 patients were seen in ear, nose and throat department of Ekiti state university teaching hospital. Total of 458 patients with tinnitus consented and were enrolled into the study. Prevalence of tinnitus in this study was 11.4%. The male were 64.7% and the male female ratio was 3:2.

The peak age group was in the third decade. There were 41.8% married and 27.6% widow/widower with tinnitus. Majority of the studied population were Christian 408 (89.0%).

Secondary level of education was 43.9% while post secondary education level was 33.2%. Civil servant accounted for 31.9% and farmer accounted for 23.5%. Smoking was noticed in 17.3% and alcohol consumption accounted for 34.8%.

Major aetiological agent were ototoxicity, chronic suppurative otitis media and noise exposure as 24.3%, 17.6% and 14.3% respectively. Majority of the studied participants had 68.4% recurrent/persistent tinnitus, 31.6%, single episode of tinnitus, 53.8% short duration tinnitus, 41.7% unilateral tinnitus, 22.1% right ear tinnitus, 95.1% subjective tinnitus, 60.3% discrete tinnitus, 82.1% intermittent tinnitus and 81.1% non pulsatile tinnitus.

Tinnitus caused majority of sleep disturbances, social functioning, headache and general health as follows 54.3%, 34.2%, 32.7% and 27.1% respectively. The otological symptoms associated with tinnitus were hearing loss, earache and ear discharge they were as follows 49.5%, 26.4% and 23.1% respectively. The order of comorbid illnesses were diabetes mellitus 12.9%, obesity 7.8% and hypertension 6.1%. Normal hearing was noticed in 26.4%. Referral were mainly from 56.2% general practitioners. Prior to presentation previous treatment received were 49.8% Nil treatment.

Conclusion: Tinnitus is a common otological symptoms with prevalence of 11.4% Ekiti state university teaching hospital, Nigeria. There are various aetiological agent associated with comorbid illnesses and impact on quality of life of the suffer.

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INTRODUCTION

Tinnitus is the auditory hallucination and perception of sounds in the head or ears, usually defined as a ringing, buzzing or whistling sound¹. Tinnitus is a symptom that is clinically relevant in audiological, family physicians, Neurologists and otorhinolaryngological, head and neck practice.

Tinnitus has been reported with prevalence up to 30% in the general population, and the incidence rate in adults of 13%²⁻⁴.

About 5% of the population had severe tinnitus and approximately 3-4% present to doctor at least once in their life^{5,6}.

The major types are subjective tinnitus, in which the sound originates within the ear or head, results from abnormal neural activities which are not formed by sounds² and objective tinnitus, in which patients and other people hear the real sounds. The objective tinnitus may be pulsatile sounds caused by vibrations from turbulent blood flow that reaches the cochlea or clicking or low-pitched buzzing indicative of palatal

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myoclonus or contractions of the tensor tympani or stapedius muscle^{7,8}.

There are numerous aetiological agents which can lead to tinnitus, like, otological diseases, otic pathologies, otic barotraumas, side effect of many ototoxic drugs including local herbs, head injury, cardio-vascular pathologies and electric shock. Other causes include, metabolic, neurologic, neurological, orthopedic, pharmacological, dental and psychological conditions. It is important to note that more than one of these pathology may be present in the same individual⁹⁻¹¹.

Tinnitus is associated with impairment of functioning and quality of life. It has also been reported to be associated with sleep disturbance, impaired activities of daily living, isolation, a poor emotional balance severe anxiety and depression¹¹⁻¹⁴. In addition to its effect on the social functioning of affected persons tinnitus also makes a significant contributor to morbidity in the suffers¹⁵. Tinnitus causes various somatic and psychological disorders that interfere with the quality of life among patients with this conditions^{16,17}. The aim of this study was to determine the prevalence, sociodemographic features, aetiology, comorbidity and its impact upon quality of life of patients experiencing tinnitus in the studied population.

MATERIALS AND METHODS

This is a prospective hospital based study involving patients with presenting complaints of tinnitus at department of ENT of Ekiti State University Teaching Hospital over 5 years, (March 2012 to February 2017).

Patients were informed about the purpose, aims and objectives of the study. They were assured of voluntary participation and maintenance of confidentiality. Informed consent to be enrolled into the study was obtained from the patient or guardian before their enrollment into the study.

Interviewer assisted questionnaires were given to obtain information from the patients or guardians.

The data obtained included biodata, presenting complaints, detailed ear, nose and throat history, past medical history, family and social history. Emphases was placed on tinnitus duration, type, laterality, form, frequency of occurrence, nature, recurrence and other associated symptoms.

General physical examination to determine patient health status. Detailed ear (otoscopy), nose and throat examination was performed to determine the extent and severity of the disease.

Determination of body mass index was done by checking weight and height. Hearing assessment were done by pure tone audiometry and tympanometry. Blood pressure and fasting blood were checked. All the data obtained were documented. Previous management information data on tinnitus were obtained and documented. These also includes detail data on requested investigations, medical and surgical treatment.

Health-related quality of life by tinnitus on the studied participants was assessed with the tinnitus handicap inventory. The data obtained were collated and entered into a spread sheet and analysed using SPSS version 18. The data is then presented in descriptive forms as tables, pie chart and bar chart.

Ethical clearance was sought for and approved by the institution Health Research and Ethics committee of the centre.

RESULTS

A total of 5,221 patients were seen in ear, nose and throat department of Ekiti state university teaching hospital. There were 458 consented subjects with tinnitus during the study period which constituted 11.4% of patients seen. There were 162 (35.3%) females and 296 (64.7%) males with a male female ratio of 3:2.

The peak age group involved was the third decade (21-30). The least affected age groups were at the ages of life, (1-10) and (21-30). Figure 1 showed the age group distribution of the patients.

In this study marital status were 191 (41.8%) married and 126 (27.6%) widow/widower had tinnitus. Majority of the studied population were Christian 408 (89.0%).

Secondary level of education was found among 201 (43.9%) while post secondary education level were 152 (33.2%). Majority of the participants were civil servant 146 (31.9%) and farmer 108 (23.5%). Social habit greatly affected the predisposition to tinnitus. Smoking was noticed in 79 (17.3%) of the patients. Alcohol consumption accounted for 159 (34.8%) of the participants. See table 1 on illustration on demographic features.

The aetiological factors were ototoxicity, chronic suppurative otitis media and noise exposure as 111 (24.3%), 81 (17.6%) and 65 (14.3%) respectively. Less common aetiology were clonic palatal contraction and aneurysm and were 1 (0.2%) and 2 (0.5%) respectively. This is illustrated in table 2.

Majority 313 (68.4%) of the participants had recurrent/persistent tinnitus while 145 (31.6%) had single episode of tinnitus. Short duration (< 3 months) form of tinnitus was noticed in 246 (53.8%) of the studied participants. Unilateral tinnitus was recorded in minority 191 (41.7%) and commoner on the right ear 101 (22.1%). Subjective tinnitus constituted the main 436 (95.1%) type of tinnitus in this work. Discrete tinnitus was a commoner form of tinnitus 276 (60.3%) among the participants than multiple (musical) tinnitus. Intermittent tinnitus was 376 (82.1%) and commoner symptoms than continuous tinnitus in the patients. Non pulsatile tinnitus was found in majority of the studied population and accounted for 417 (81.1%). This is shown in table 3.

Tinnitus greatly affected the quality of life of the sufferers. In this study majority of the effect were sleep disturbances, social functioning, headache and general health as follows 249 (54.3%), 157 (34.2%), 150 (32.7%) and 124 (27.1%) respectively. This is illustrated in figure 2.

Tinnitus is associated with other Otological symptoms and in various combination. Main symptoms associated with tinnitus were hearing loss, earache and ear discharge this is as follows 227 (49.5%), 124 (26.4%) and 106 (23.1%) respectively. See figure 3 for this illustration.

Some comorbid illnesses encountered included diabetes mellitus 59 (12.9%), obesity 36 (7.8%) and hypertension 28 (6.1%), as in figure 4.

Figure 5 illustrated pattern of hearing among participants. Normal hearing was noticed in 26.4%, Mild hearing loss and Moderate hearing loss accounted for 20.1% and 16.6% respectively. Worst hearing loss were Severe hearing loss 10.6% and Profound hearing loss 9.8%.

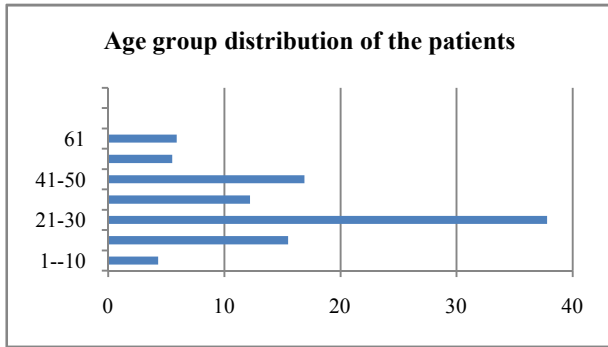


Figure 1 Age group distribution of the patients.

Table 1 Sociodemographic characteristics of the patients.

Sociodemographic	Number	Percentage (%)
Sex		
Male	296	64.7
Female	162	35.3
Marital status		
Single	46	10.1
Married	191	41.8
Widow/Widower	126	27.6
Divorce	98	21.5
Religion		
Islamic	48	10.4
Christianity	408	89.0
Others	3	0.6
Level of education		
Nil	5	1.2
Primary	99	21.7
Secondary	201	43.9
Post secondary	152	33.2
Occupation		
Civil servant	146	31.9
Student/Apprentice	75	16.4
Applicant	80	17.4
Farming	108	23.5
Others	45	9.8
Social habit		
Alcohol	159	34.8
Smoking	79	17.3
Exercise	28	6.2

Table 2 Aetiology of tinnitus among participants

Aetiology	Number	Percentage (%)
Ear wax impaction	30	6.5
Otitis externa	22	4.9
Otitis media with effusion	10	2.2
Chronic suppurative otitis me	81	17.6
Presbycusis	48	10.4
Hypertension	28	6.1
Diabetes mellitus	4	0.8
Noise exposure	65	14.3
Meniere's disease	38	8.2
Ototoxicity	111	24.3
Anaemia	5	1.2
Aneurysm	2	0.5
Clonic palatal contraction	1	0.2
Idiopathic	13	2.8

Referral were mainly from general practitioners and audiologist and accounted for 56.2% and 28.1% respectively. Prior to presentation previous treatment received were No treatment

49.8% and Medication 24.6%. Previous treatment satisfaction by the participants were No effect 60.7% and Medication 21.6%. See figure 5 for the illustration.

Table 3 Patterns of tinnitus patients

Pattern of tinnitus	Number	Percentage (%)
Recurrence		
Single episode	145	31.6
Recurrent	313	68.4
Duration		
Short duration	246	53.8
Long duration	212	46.2
Laterality		
Unilateral	191	41.7
Bilateral	267	58.3
Types		
Subjective	436	95.1
Objective	22	4.9
Form		
Discrete	276	60.3
Multiple	182	39.7
Occurrence		
Intermittent	376	82.1
Continuous	82	17.9
Nature		
Pulsatile	41	8.9
Non pulsatile	417	91.1

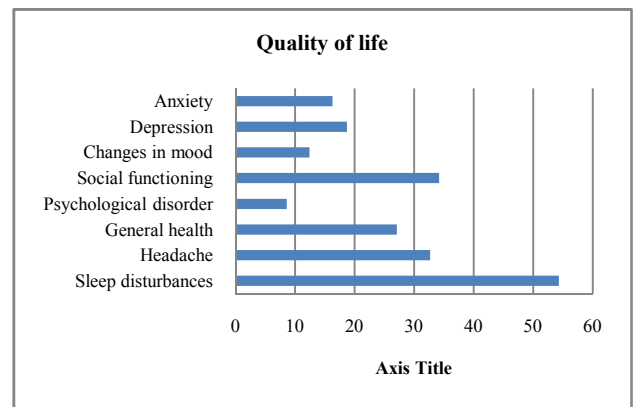


Figure 2 Quality of life among tinnitus patients

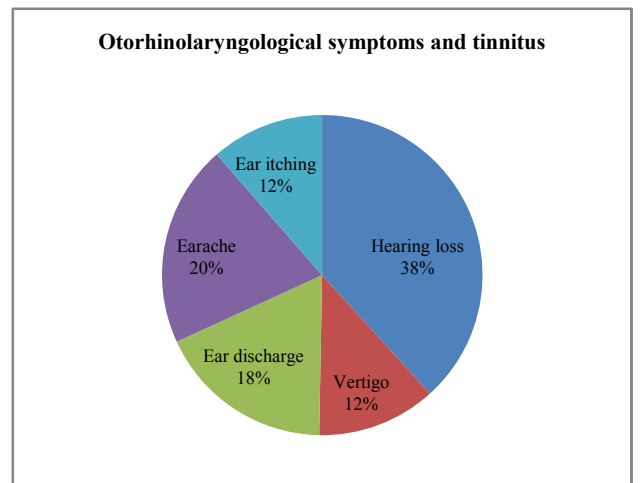


Figure 3 Otorhinolaryngological symptoms and tinnitus

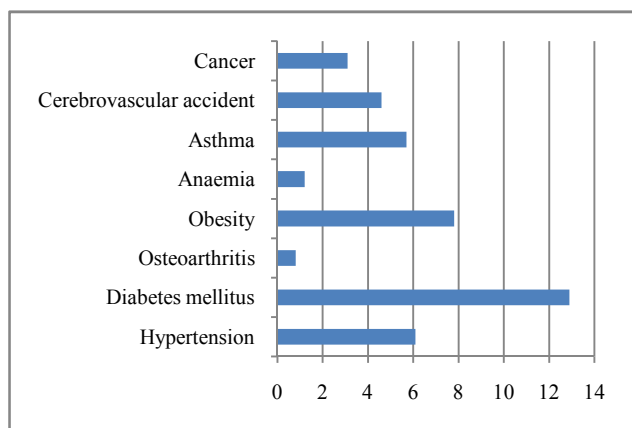


Figure 4 Comorbid illnesses and tinnitus

Table 4 Pattern of management of tinnitus patients

Management	Number	Percentage (%)
Referral		
Self reports	12	2.7
General practitioners	257	56.2
Neurologist	34	7.4
Psychiatrist	26	5.6
Audiologist	129	28.1
Previous treatment		
No treatment	228	49.8
Medication	113	24.6
Tinnitus masker	21	4.5
Relaxation	82	17.9
Hearing aids	15	3.2
Previous Rx satisfaction		
No effect	278	60.7
Medication	99	21.6
Relaxation	69	15.1
Hearing aids	12	2.6

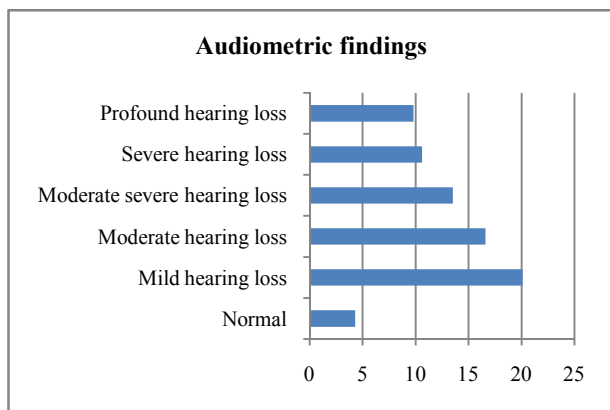


Figure 5 Audiometric findings in tinnitus patients

DISCUSSION

This study revealed a prevalence of 11.4% tinnitus in the studied population. Different studies reported prevalence between 7.0% and 20.0% within which the prevalence in this study falls^{10-12,18}. The prevalence is peaked at middle aged, 21 to 30 years of all participants attending the ear, nose and throat department of Ekiti state university teaching hospital. Other studies found that tinnitus prevalence increased and peaked at either 60 to 69 years or 70 to 79 years, with a subsequent decline in older age groups^{3,19,20}.

In this hospital based study in a specialized otorhinolaryngological clinic tinnitus character such as

recurrent, short term, unilateral, discrete, intermittent, subjective and non pulsatile pattern are the commonest. These features help in determining the nature of patient pathology, assessment and subsequent management.

There are various aetiological factors that affected the prevalence of tinnitus in this research work. Three pathological mechanisms have been proposed to underlie tinnitus namely^{1,11}. Firstly, changes in the level of spontaneous neural activity in the central auditory system. Secondly, changes in temporal pattern of neural activity. Lastly, reorganization of tonotopic maps. Studies revealed tinnitus prevalence increased with age, higher prevalence of tinnitus was noticed in men than women^{19,20}. High noise levels exposure (cause hair cell damage) is associated with tinnitus¹⁸⁻²². Systemic diseases such as cardiovascular diseases, ischemic heart disease and hypertension are also potential risk factor of tinnitus²⁰⁻²². Hypertension leads to generalized microangiopathic changes which also affect the cochlear arterial circulation as well. It is important to note that drugs (various ototoxic chemicals) such as antimicrobials, diuretics, chemotherapeutic drugs, steroids, nonsteroidal antiinflammatory drugs were associated with tinnitus²⁰⁻²². Some studies have suggested that some factors such as hearing loss are likely to cause tinnitus²³. This due to increases in the ambient noise. Studies has established causal relationship between obesity and tinnitus. Surgical weight reduction has been very effective in relieving persistent tinnitus in morbidly obese patients with associated pseudotumorcerebri syndrome²³. Some studies reported tinnitus as feature of otoneurological complications in diabetes mellitus patients due to disturbances of glucose metabolism in the inner ear diseases²⁵. Diabetics also appear to have more significant vestibular system changes compared to auditory system²⁶.

Otological symptoms are significantly associated with tinnitus in different Otorhinolaryngological diseases. This is also noted in this study. Hearing loss, vertigo and tinnitus were triad of symptoms of life threatening diseases such as Meniere's disease, vestibular schwannoma and Presbycusis. These disease can make life miserable for the sufferer. Tinnitus is associated with other abnormalities such as increased hearing thresholds and high tone hearing loss in clinical practice.

In this study, impact of tinnitus upon one person's quality of life was observed. It is important to note that tinnitus has many negative repercussions on the sufferer. These effect on quality of life includes sleep disturbance, defectuous concentration on daily and professional activities, isolation and a poor emotional balance can be often found in tinnitus patients. Anxiety and depression should be noted and be rule out. Tinnitus may be severe enough to warrant psychiatric consultation referral and intervention²⁶.

Hearing loss is usually associated with tinnitus. This is due to reduction in ambient sound in individual with hearing loss. Majority of the tinnitus are of the subjective type. In this study, total number of patients complaints of hearing loss is less than that of audiometric number findings. Patient are unawares of their Mild hearing loss and is the commonest. These findings are similar to others studies²⁰.

Majority were not on treatment during the review by the Otorhinolaryngologist, head and neck surgeon. Majority of those on treatment were not satisfied. This is due to poor

understanding of aetiopathogenesis and management of tinnitus.

CONCLUSION

Prevalence of tinnitus of 11.4% is very high in this hospital based study. This study on tinnitus has thrown more light into the sociodemographic features, aetiology, comorbid illnesses and impact upon quality of life of sufferer. There need to increase level of awareness among the health care given to achieve optimal care.

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