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TINNITUS AMONG PATIENTS IN GHANA

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ABSTRACT
A study to determine the prevalence of subjective tinnitus was carried out at the Kumasi Hearing Assessment Centre in central Ghana. A total of two thousand two hundred and seven (2,207) out-patients aged between 6- >65 years, who complained of hearing problems or tinnitus either in isolation or in association with hearing loss, were seen from January 1995 to December 1998.
The procedure adopted included a detailed case history and a study of the patients medical notes, otoscopy and audiometric evaluation. Out of the 2,207 patients seen, 384 (19.3%) complained of tinnitus. 87 (22.5) of the e84 patients suffering from tinnitus had normal hearing. In addition patients with mild hearing loss had more tinnitus than other degrees of hearing loss. There was a relationship between tinnitus and associated symptoms. Tinnitus was described as intermittent and constant and increased with advancing age; it also had varied degrees of annoyance effect.
Key words: Subjective tinnitus, prevalence, associated symptoms, annoyance effect, management.

INTRODUCTION

Subjective tinnitus, the false perception of sound in the absence of acoustic stimulation in the environment is a common problem. The etiology of tinnitus remains elusive despite increased knowledge of the anatomy and function of the cochlea and the brain. Multiple factors such as age, exposure to noise and ototoxicity appear to play a role in the cause of persistent tinnitus[1].
Additionally, tinnitus is associated with hearing loss of many etiologies including sensorineural hearing loss (SNHL), damage to the acoustic portion of the eighth cranial nerve by tumours or other conditions including transaction of the nerve as well as minor disturbances including impacted wax.
Tinnitus, like hearing loss increases in prevalence with advancing age. The prevalence of tinnitus in children has been reported in a number of studies[2,3,4] . Also, studies have found tinnitus to be more common in those with a mild to moderately severe hearing deficit (up to 70 d**B**) than normal hearing or profoundly deaf children. In advanced countries, tinnitus affects almost a third of the population over the age of 55 and is reported as having a severe impact on quality of life in about a third of that number.
"Even though studies have been conducted into the prevalence of deafness in Ghana", there is no data on the prevalence of tinnitus in the country. In this paper, we present the results of a study to determine the prevalence of tinnitus among patients who attended a major teaching hospital in central Ghana between January 1995 and December 1998.

MATERIALS AND METHODS

A total of two thousand two hundred and seven patients aged 6 to above 65 years who sought medical advice on hearing impairment or complained of tinnitus (either in isolation or in association with hearing loss) were seen at the Ear, Nose and Throat clinic at the Komfo Anokye Teaching Hospital (KATH) in central Ghana from January 1995 to December 1998. As far as possible, a detailed case history was taken. The case history was based on the extracts of the questionnaire used by Martin and Snashall[9]. This includes name, age, sex, hearing status, details of tinnitus and related conditions, occupational noise exposure, hearing aid possession and use and success of any remedies. Subjective tinnitus was operationally defined as an apparent acoustic sensation for which there is no external cause. That is, the person hears the tinnitus, but it cannot be heard by others. Post Stimulus Tinnitus was also defined by exclusion of those who heard it "only after a loud sound, or those in whom it did not usually last for longer that five minutes."[10,11] Also, excluded were sensations which were described as pulsating and coincidental with the heart beat, clicking sensation resulting from the spasm of stapaedial or tensor tympanic muscle, muscles of the Eustachian tube and those with dysfunction of the temporal mandibular joint (TMJ)".

Again, those who were treated with medical therapy successfully were later excluded from the study. Otological examination was also performed by an Ear, Nose and throat specialist and patients suspected of having objective tinnitus were excluded from the study.

An assessment of hearing was done by using conventional pure-tone audiometry (Kamplex AD 27). Testing was done in a modern purpose-built acoustically treated room at the hospital with an overall ambient noise level of around 30 d**B** A (Crest Sound Level Meter, Model 2700). The frequencies used were from 250Hz through 8000 Hz for air conduction testing and from 250 Hz through 4000 Hz for bone conduction. Threshold was defined as normal if hearing level is equal to or less than 25 d**B** HTL. Measurements of frequency resolution and specific conditional tests on tinnitus such as visual Analog Scales (12) could not be performed due to lack of this facility.

RESULTS

A total of 2207 patients were identified in the target age ranges of 6 to >65 years.. Table I depicts the number of patients seen at the ENT Clinic at Komfo Anokye Teaching Hospital in central Ghana between 1995 and 1998 for medical advice on hearing-impairment and tinnitus.

Table I. Number of patients seeking medical advice on hearing-impairment and tinnitus (PST) from 1995 to 1998.

Year	No. seen	No. with Tinnitus
1995	380	36
1996	430	56
1997	540	97
1998	857	195
Over All	**2207**	**384**

The proportion of patients complaining of tinnitus in different age bands was shown in Table II. A close inspection of this table revealed that tinnitus increased with advancing age. For example, at the age rage of 6-15 years, the number increased to 143 (20.9%).

Table II. Number of patients complaining of tinnitus in four age groups. Percentage contributions to the total is also shown.

Age (Years)	No.	Tinnitus	Percentages
6-25	626	56	8,9
26-45	600	95	15.8
46-65	553	105	19.8
>65	423	143	20.9
Over All	**2207**	**384**	

Table III. Tinnitus as a function of hearing difficulty (1995-1998). Entries (tinnitus) are numbers and percentages within each degree of hearing difficulty in worse ear and over all grades of hearing combined.

Hearing Difficulty	Number	No. Tinnitus at all	Tinnitus
Normal	220	133	87 (22.5%)
Mild	438	339	99 (26.6%)
Mild- moderate	383	330	53 (12.8%)
Moderate	359	318	41 (10.9%)
Severe	483	403	80 (20.3%)
Profound	324	300	24 (7.1%)
All grades	**2207**	**1723**	**384**

Table IV. Tinnitus and its Associated Symptoms.

Name	Yes %	No %	Not sure %
Migraine, Recurrent Headache	60	36	4
Vertigo, Dizziness, Meniere's Disease	63	29	8
Ear Pain (Otalgia)	40	57	3

Table III displays tinnitus as a function of hearing difficulty. Observe that 87 (22.5%) of the 384 patients who complained of tinnitus had normal hearing. The severity of hearing loss ranged from less than 25 dB to more than 90 dB HTL (average pure-tone threshold at .05 through 4 KHz inclusive). It can be observed that patients with mild hearing loss had more tinnitus than other degrees of hearing-impairment (26.6%). Tinnitus was less prevalent in patients with profound hearing loss.

In addition, the hearing loss was sensorienural in 40% cases, conductive in 3% and mixed in 57% cases. Constant tinnitus was associated with normal hearing (Table IV), while intermittent tinnitus was associated with hearing loss ($P<.005$). Other associated symptoms accompanying the tinnitus as reported by the patients included headache, dizziness, features suggestive of Meniere's disease and ear pain. 14% of patients reported no annoyance effect, 6% indicated slight annoyance; 68% of patients complaining of tinnitus reported that tinnitus was bothersome, while 12% complained of severe annoyance effect (Table V).

Table V. Prevalence of Tinnitus by annoyance effect.

Annoyance Effect	No. with Tinnitus	%
No annoyance	54	14
Slight annoyance (difficulty concentrating)	23	6
Moderate (bothersome)	261	68
Severe (sleep disturbance)	46	12
Total	**384**	**100**

DISCUSSION

Subjective tinnitus is a common and occasionally disabling condition. We have studied 2207 patients attending the ENT clinic at KATH in Kumasi in central Ghana. Out of this number, 384 (19.3%) complained of tinnitus. That is, the prevalence of tinnitus in the population studied in Ghana was 19.3%. Other studies of the prevalence of tinnitus have demonstrated that this disturbance was present in 10% of the British population [13,10], 32.4% in the USA [14], 14.2% in Sweden [15] and 14.5% in Italy [16]. Thus, the prevalence of 19.3% of patients complaining of tinnitus, that was noted in our data, was closer to the European figure of about 14.5% and lower than the 32.4% reported in the USA study. Table II depicts the occurrence of tinnitus in relation to age. It was observed that age had an increasing effect on the prevalence of reported tinnitus. For example, between the ages of 6-25 years, the prevalence of tinnitus was 8.9%, but this has increased to 20.9% for patients who are older than 65 years. This confirmed other findings which reported that tinnitus, like hearing loss increases in prevalence with advancing age[5,6].

Our data revealed that 49.1% of our population had normal to mild hearing loss. In those with significant hearing-impairment, all degrees of hearing loss were represented. We have also shown that tinnitus was less prevalent in those with profound hearing loss (7.1%) than other degrees of hearing loss. We found tinnitus to be more common in patients with a mixed hearing loss (57%), followed by those with sensorieneural hearing loss (40%) and conductive hearing loss (3%). This is at variance with the findings of Mills and Cherry[3] who found tinnitus to be more common in children with secretory otitis media (44%) than children with sensorineural hearing loss. We cannot stress this disparity too far, since this may be accounted for by the different age range in our study. Again otosclerosis which is very common among Caucasians and is often accompanied by tinnitus and characterized by progressive conductive hearing loss is very rare among people of Black origin[17]. This may explain the very low rate of 3% with conductive hearing loss. Our data has also indicated that majority of patients complaining of tinnitus also had recurrent headache and dizzy episodes. This is in agreement with other studies[9]. As reported, the study revealed

the following annoyance effects of tinnitus: 14% - no effect, 6% slight annoyance, 68% moderate annoyance and 12% severe annoyance. Previous studies focusing on children, have found that most children with tinnitus are not bothered by it. In contrast, only 14% of the population sampled by Martin and Snashall, reported that their tinnitus did not bother them. The results of other studies attempting to link the psychophysical characteristics of tinnitus to its emotional impact have produced conflicting results. Indeed Snufffer and Tyler[19] noted a significant correlation between the reported tinnitus and its degree of annoyance. In a conflicting report, Mekle et al found no correlation between the perceived tinnitus and emotional impact. This conflicting results in the literature is not surprising, since we know that tinnitus research has been hampered by the lack of suitable investigatory techniques. Lockwood et al[21] observed that, while the psychophysiological characteristics based on the ability of patients to compare their internal sensation to external stimuli have been described in detail, indirect testing with visual analog scales (VAS) and questionnaire measurements in human subjects have not been available until recently. That is, the introduction of functional imaging techniques that make it possible to study subjective phenomenon and sensation in humans, have only recently been applied to the study of tinnitus [22,23].

CONCLUSION

Tinnitus is known to create a lot of problems for the victims affected. It may lead to anxiety, irritability, tension, interference with sleep, annoyance, prevention of work efficiency and so on. Indeed in Europe, it is cited often as a cause of suicide. The purpose of this study was to determine the prevalence of tinnitus in Ghana and to ascertain the associating symptoms and the emotional impact on the affected victims. Our results have demonstrated that the disturbance is present in 19.3% of the population studied. Studies of the prevalence of tinnitus in other countries produce varied results. But our data is closer to the prevalence rate of 14.2% in Sweden and 14.5% in Italy. Regarding hearing difficulty, our results agreed with other studies. That is, tinnitus can occur in the absence of hearing loss. In addition, the severity of hearing loss in those with tinnitus ranged from <25 dB to 90dB **HTL.** Again, tinnitus was more prevalent in patients with mixed hearing loss than other types of hearing loss and that headache and dizziness are the common associated symptoms. In addition, the etiology of tinnitus remains elusive despite increased knowledge of the anatomy and function of the cochlea and the brain. Multiple facts, such as age, exposure to noise and otoxicity appear to play a leading role in the cause and persistence of tinnitus. Even though tinnitus is a real problem, modalities for therapy are far from satisfactory. In the past two decades various hypothesis have been proposed with increasing emphasis on central processing. Many treatment modalities for tinnitus have been presented with mixed results. These have been classified as the “five Ps” and supplemented with the “three Ss”. These are, “prevention of mostly noise-induced tinnitus, pathological treatment of cause, psychological management that is designed to reverse the psychological effects of tinnitus and promote habituation; prosthetic management to mask or inhibit the tinnitus; pharmacological treatment to reduce tinnitus; surgery; suppression by electrical stimulation and suppression by spontaneous oto-acoustic emissions. In our department, the use of peripheral vasodilators like Ginnarizoine and Micotinic acid have proved to be efficacious in about 30-40% of our patients. These drugs increase the peripheral circulation of the inner ear, thus allegedly reducing the irritation of the cochlear eighth nerve. During the last two decades, hyperboric oxygenation therapy (HBO) has also been used in the treatment of sudden deafness and chronic distressing tinnitus. But, out of the several management regimes known, only two methods of tinnitus rehabilitation are currently prescribed in general to patients suffering from subjective tinnitus. That is, tinnitus masking and psychological treatment, both being symptomatic forms of treatment. African countries should train specialists in modern trends in tinnitus management since the prevalence of tinnitus is high, as evidenced by this study.

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