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How to deal with tinnitus

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Abstract
Tinnitus is the name for a ringing or buzzing noise in one or both ears which are not caused by sounds coming from the outside world, tinnitus can manifest in different forms like a hissing noise, cricket like sound, humming noise, roaring noise, buzzing noise, pulsing or pulsating noise etc., tinnitus may be constant or fluctuating in nature. Tinnitus is usually a symptom and not a disease itself, but it's becoming more common. Tinnitus is often experienced in quiet settings e.g., at night when there is relative silence everywhere. This occurs principally due to lack of external sound to mask the tinnitus. Tinnitus might get better by itself if untreated as there is no known cure to all types of tinnitus yet but in the main while there are treatments that can help treat or manage the condition. Tinnitus prevention and treatment is still being heavily researched into till date. This paper looks into diagnosing, management and treatment of tinnitus.

Keywords: deal with tinnitus, sound, humming noise, roaring noise, buzzing noise, pulsing or pulsating noise etc.

Introduction
Tinnitus comes from the Latin *tinnire* which means "to ring" [1] Tinnitus can be defined as the perception of sound when no corresponding external sound being present [2]. Tinnitus affects about 10-15% of people but averagely only 1-2% of all people have significant conditions [3]. There are several causes of tinnitus which it's either -auditory related or non-auditory related. Almost everything that can go wrong with the auditory system can trigger tinnitus. Impacted wax impinging on the tympanic membrane (eardrum) can cause tinnitus, perforated tympanic membrane, otosclerosis, Meniere's disease, labyrinthitis, cochlea damage resulting from exposure to long duration of high intensity noise or use of ototoxic medications or ear damaging chemical agents, auditory brain-stem tumor, age-induced hearing loss (presbycusis) [5].
Some non-auditory causes of tinnitus are high blood pressure, cervical spondylosis, diabetes, temporo-mandibular joint disorder, emotional stress (more common in those with depression) [4, 5].

Effects of tinnitus
Tinnitus can be a chronic condition causing loss of concentration, intense anxiety, anger, fear, irritability, sadness, anti-social, depression, sleeplessness, frustration and in some few cases suicide commonly in those with strongly annoying tinnitus [6, 7].

Types of tinnitus
Tinnitus is generally classified into "subjective and objective tinnitus" Tinnitus is usually subjective, meaning that the sounds the person hears are not detectable by means currently available to physicians and hearing technicians [1] Subjective tinnitus has also been called "tinnitus aurium", "non-auditory" or "non-vibratory" tinnitus. In rare cases, tinnitus can be heard by someone else using a stethoscope. Even more rarely, in some cases it can be measured as a spontaneous otoacoustic emissions (SOAE) in the ear canal. This is classified as objective tinnitus also called "pseudo-tinnitus" or "vibratory" tinnitus [1]. Some people experience pulsatile tinnitus which is a sound that's in sync in time with their heartbeat or pulse, Pulsatile tinnitus is usually objective in nature, resulting from altered blood flow, increased blood turbulence near the ear, but it can also arise as a subjective phenomenon from an increased awareness of blood flow in the ear [9].

Diagnosing tinnitus

To help identify the cause of your tinnitus, a specialist will try to identify whether your tinnitus is caused from the auditory system or by another underlying condition.

The first step will be to have an audiological assessment which will comprise of otoscopy, tympanometry, oto-acoustic emission, pure tone audiometry which after a tinnitus assessment or acuphenometry consisting of tinnitus pitch matching, tinnitus loudness level and minimum masking level can be achieved if the sound is tonal in nature. The use of tinnitus handicap inventory can be used as a case history to have more insight to the level of tinnitus the patient perceives this usually consists of 25 easy-to-understand questions for the patient, who has three options for answering each question: yes, sometimes, or no. The sum of the total score can go from 0 to 100. Grade 1(slight), or very mild, tinnitus perceived only in a quiet, easily masked environment, which almost never disturbs the patient. Grade 2 (mild) Tinnitus masked by ambient noise. Grade 3 (moderate) tinnitus that is perceived despite ambient noise, although it does not interfere with daily activities. It does, however, disturb rest or quiet and sometimes makes it difficult to sleep. Grade 4 (severe) tinnitus is always perceived, interfering with daily activities, always making it difficult to rest and sleep. These patients frequently seek help from specialists. Grade 5 (catastrophic): all symptoms are worse than grade 4, especially insomnia. It is possible to find some associated with psychiatric disorders. In other cases, other assessments may be needed like physical movement where the specialist will give you task like move your eyes, clench your jaw, or move your neck, arms and legs etc. to know if the tinnitus worsens or reduces. Some cases may require imaging tests depending on the suspected cause of your tinnitus, you may need imaging tests such as CT scans or MRI scans to confirm any suspicion of a retro-cochlea lesion. The evaluation can show the conditions which the tinnitus is the symptom of such as wax impaction, otosclerosis, meniere's disease, noise induced hearing loss, presbycusis, acoustic neuroma, hypertension. In some cases of tinnitus, the cause is idiopathic, but the specialist can help reduce the severity of your tinnitus with tinnitus management options or to help you cope better with the noise [10, 12].

Available Managements for Tinnitus

Pharmacologic approach

Evidence-based pharmacological approaches are limited to the treatment of tinnitus comorbidities such as anxiety, depression, and insomnia with antidepressants, anxiolytics (anti-anxiety) and some sedatives for sleep. Currently there is no drug that is approved by the Food and Drug Administration (FDA) or the European Medicines Agency (EMEA) for the treatment of tinnitus. There's however promise on use of pharmacologic drugs for the treatment of tinnitus [13].

Surgical approach

In a very severe but rare cases cochlea neurectomy have been used, thereby sacrificing hearing in the affected ear. This may be a matter of last resort unfortunately; evidence has revealed limited success with neurectomy in the alleviation of tinnitus Obviously, those with middle ear pathology e.g., Otosclerosis and who have had Stapedectomy surgery have reported total elimination or reduction of tinnitus, same goes for those who had cerumen management (wax removal) and tympanoplasty (surgical repair of the perforated ear drum) tinnitus caused by noise-induced, drug-induced, or other forms of damage to peripheral auditory structures, surgical control remains more elusive. At present, the most accepted treatment surgically for tinnitus is cochlear implants, which masks the patient's tinnitus [16].

Audiological:

Counselling is paramount in the treatment of tinnitus. Some counselling tools are behavior modification, cognitive behaviour therapy (CBT), patient education, tinnitus retraining therapy (TRT). Hearing aids are known to reduce or even eliminate some forms of tinnitus. If a patient has a hearing loss and the tinnitus is in the middle or lower frequency area, a hearing aid will often be of good use. The hearing aid renders the patient capable of hearing ambient environmental noises instead of the tinnitus. Tinnitus maskers mostly incorporated into modern hearing aids can be activated to mask the tinnitus. This is psychologically relieving to the patient knowing that the noise is external rather than internal. Of course, it needs be emphasized that it's not all patients that benefit from hearing aids/maskers [12].

Use of radio or fans to mask the internal sound (tinnitus)-this is known as environmental sound enrichment approach. Neuromonics tinnitus therapy devices that looks like MP3 device that patient can wear on his/her ears and listen to acoustic stimulation such as broad frequency sound or music which is external to the tinnitus used best to mask the perceived noise [12, 13].

Psychological

Biofeedback is a relaxation therapy that has been effectively used for tension headaches and stress management. Since stress tend to worsen tinnitus, it may serve as an option for management of tinnitus.

Dental treatment especially if dental is involved has been one of the options for temporo-mandibular joint (TMJ) induced tinnitus.

Alternative therapies like meditation, mindfulness practice, ocean wave exposure, yoga, hypnosis and acupuncture are also recommended [11].

Electrical Stimulation

Electrical stimulation is a very promising treatment for tinnitus patients. Electricity has been successfully applied to the brain with transcranial magnetic stimulation with some degree of success on tinnitus patients. Extensive research is still ongoing with this promising therapy [14, 15, 17].

Dual stimulation

Process like targeted bimodal auditory-somatosensory stimulation makes use of electrical and auditory stimulation simultaneously in treating tinnitus by stimulating the tragus nerve with a combination of sounds via the auditory system. Such processes are still in very early stages but they show some promising progress for the future [17].

Conclusion

Every patient's tinnitus is quite unique, so it's very vital for each individual experiencing tinnitus to go see a specialist

(general practitioner, otolaryngologist, audiologist) to diagnose and help manage his or her tinnitus, as what might be help full for patient a might not be helpful for patient b. with the notion that tinnitus sometimes is usually a warning sign or a symptom to something brewing in the body, a quick and timely action can go a long way to nip the issue in the but before it becomes worse.

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