

EDITORIAL

OBJECTIVE TINNITUS

It is a symptom not a disease which is perception of sound at cerebral cortex without acoustic stimuli. The tinnitus is derived from latin word tinnire meaning to ring. It is distinct from auditory hallucination which is perception of voices or music and not affected by environment while tinnitus is aggravated in quiet surrounding and diminish or subside with external sound stimuli. Sensation of tinnitus may be explained as ringing, buzzing, whistling, roaring, hissing, steam escape or clicking sound. The sound is usually heard in head and frequently associated with cochlear deafness difficult to localize the side, if possible, lesion is in ipsilateral temporal bone.

The incidence of tinnitus varies from 5 to 30 % at our centre attending OPD is less than one percent. In northern India most of elderly presume that it is an aging symptom after the age of forty years both sex are equally affected.

Classification

Tinnitus may be classified as :

Vibratory / Non Vibratory

Pulsatile / Non Pulsatile

Continuous / Interrupted

Subjective / Objective

Low / High Pitch

Single / Multiple Sound

Loud and distracting / Soft

Etiology

Various theories has been proposed -

1. Central nervous system responds to disorganized activity hair cells, importing signals without external stimuli.

2. Chemical changes in cochlea and auditory nerve hence spontaneous nerve activity in auditory nerve may be responsible.

3. Study by Positron emission tomography generate tinnitus in tinnitus suggests that a deferent area of brain is triggered and stimulated.

4. Any occlusion external or internal of blood vessel leading to turbulent blood flow specifically carotid artery or jugular vein may generate pulsatile objective tinnitus.

5. Clavicle movement of palato pharyngeal region may lead to myoclastic tinnitus including of temporomandibular joint.

Eustachian tube dysfunction, ossicular chain abnormalities include otosclerosis, middle ear pathologies, perilymph fistula, Meniere's disease. Schwannoma may generate the tinnitus.

Location

It is believed that problem lies from hair cells (cochlea) and auditory neural pathways.

Predisposing factor

Apart from loud noises, blast trauma, emotional trauma, ototoxic drugs.

SUBJECTIVE TINNITUS

When sound is perceived only by patient and investigator has to rely on the subject, wax, infection, allergy, inflammation, tumours, metabolic disorders like diabetes, thyroid disorders severe anemia, over medication, emotional, acoustic trauma and fatigue may precipitate or aggravate the symptoms. The centre for emotion is closely associated with site of tinnitus centre hence emotional

disturbances aggravate the tinnitus and vice versa. Tinnitus may lead to depression, irritability and other behavioral changes leading to problems in job profile too. Autonomic nervous system is also closely associated to sound and tinnitus centre hence tinnitus and loud sound may lead sleep disturbance and in acute stage dilatation of pupil, tachypnoea, pallor of face and syncope. Though literature report an incidence of more than 20% are disrupted from their work or socio familial life but in Indian scenario the incidences is quite low.

Otologic Factors

External Ear

- Wax
- Foreign Body
- Hairs Touching the Tympanic Membrane
- Tympanosclerosis
- Cholesteatoma of Canal
- Perforation of Drum.

Middle Ear

- Negative Pressure (E.T. Dysfunction)
- Fluid (OME)
- Otosclerosis
- Ossicular Pathologies
- C S O M

Inner Ear

- Labyrinthitis
- Labyrinthine Hydrop
- Hair Cell Disorder.

OBJECTIVE TINNITUS

The sound of tinnitus can be heard by investigator. In majority of the cases we can reach to final diagnosis hence can be cured.

Classification

A. Vascular disorder or abnormalities

- Arteriovenous malformation
 - Congenital
 - Acquired
- Glomous tumour / Tympanicus
- Stenosis, carotid or vertebral artery
- Vascular loop of anterior inferior cerebellar artery over auditory nerve

Venous hums

- Benign intraclavical hypertension (pseudo

motor cerebri)

- Hypertension
- Dehiscent jugular bulb.
- Dissection of carotid or vertebral artery
- Increased haemo dynamics
- Severe anaemo
- Pregnancy
- Diabetes
- Thyro toxicosis

Mechanical causes

- Tensor tympani or stapedus muscle myoclavis
- Palatal myoclavis
- Eustachian tube abnormalities
- Temporo mandibular joint disorder
- Shiffling foreign body or wax.

The most common cause of pulsatile or objective tinnitus is pseudomotor cerebri or benign intro cranial hypertension, followed by carotid artery disease and glomus tumour. Though enlarge vertebral artery, aberrant stapedus artery, intro cranial tumour may also leads to in pulsatile tinnitus.

Benign intra cranial hypertension

Common in young, obese female patients. There is elevated intra cranial hypertension with headache, visual changes dizziness without hydrocephalus but cranial nerves (IV, V, VII) may be affected. The disease is self listening. Tinnitus is due to pulsatile of cerebro spinal fluid.

Glomus Jugular

Glomus jugular (paragangliome) as the name suggests it arises from Paraganglio with in the adeventitia of the jugular bulb. While **glomus tympanicus** arises from the area of Jacobsen's nerve at promontory in middle ear. Tinnitus is unilateral more in females and right side in between the age of 30-50 years.

These can be visualized as pinkish mass an otoscopy along with conductive hearing loss and can be confirmed by magnetic resonance angiography.

Atherosclerotic disease

Atherosclerosis of internal and external

carotid, subclavian is a common cause of pulsatile tinnitus along with dizziness diminished loss of memory (forget fullness), generalized feeling of weakness, carotid bruit can be heard usually over orbit or on ear.

Dissection of carotid or vertebral artery or persistent stapedus artery may lead to tinnitus. In cases of persistent stapedus artery middle meningeal artery and foramen spinosum do not develop.

Iatrogenic arterio venous malformation following myringoplasty and mastoid surgery leading to pulsatile tinnitus has been reported in literature.

Mechanical non vascular causes

Rhythmic contraction of tensor veli palatine, levator veli palatine, stapedus or tensor tympani muscle may lead to tinnitus which is usually clicking sound can be heard by investigator. Frequency ranges from 10 to 240 / mts. The rate does not correspond to arterial pulse or heart beat. The clicking causes by tensor veli palatine due to Eustachian tube opening while stapedus and tensor tympani result in ossicular chain motion hence movements or palate or tympanic membrane may be seen as the case may be.

The myoclonus is generated due to neuro muscular disorder in multiple sclerosis cerebri vascular disorder (brain stem infarct) intra cranial neoplasm and psychogenic problem.

In a patulous Eustachian tube tinnitus may be the result of perception of respiration sounds from nasopharyngeal end air turbulence hence cessation of respiration clinches the diagnosis patient usually complains of abnormal awareness of his own voice with statements I hear myself in ear termed as autophony. Oestrogen or gross reduction of weight without exercise contribute to this condition movement of tympanic membrane is rhythmic but cessation of respiration stops the movement which

persists in tensor tympani myoclonus. Engorging the Eustachian tube area by shifting the patient in tendelburg position may stop the tinnitus.

Management

General condition like severe anaemia, pregnancy, thyrotoxicosis, diabetes and hypertension should specifically be looked for in general examination, wax, infection of external and middle ear may lead to tinnitus which can be managed well, stethoscope should be put over ear, eye and carotid region for a pulsation or bruit. An audiogram and tinnitus matching should be performed.

- Counselling
- Avoid loud sounds
- Elimination of alcohol, increases flow and pore of blood, tobacco
- Avoid caffeine and nicotine (constricts blood vessels).
- Avoid quiet environment listen soft music (melodious) of choice or noisemakers life fan.
- Distract your attention- avoid focus on tinnitus
- Regularize style and 8 hour night uninterrupted sleep
- Change life pattern, avoid stress
- Regular exercise and relaxation techniques.

Noise generators

Water fountains, fan, pillow speaker, in the ear, sound generator, all these act as tinnitus maskers. Those who have got associated hearing loss hearing aid provides amplification hence even outside noises mask the tinnitus and provide relief. Remember hearing aid do not amplify tinnitus while improve speech perception, so are more effective in low pitch, tinnitus with sensorineural hearing loss. Cochlear implantation and surgery for otosclerosis may provide dramatic relief in tinnitus apart from hearing improvement.

Deity Supplements**Magnesium**

- Noise exposure causes magnesium to be excreted from body hence addition of 500 to 1000 mg / day in diet is recommended.

- Vitamin B₁ (thiamin) 100-500 mg/day
- Vit D3 (niacin) 50-500 mg/ day
- Zinc 50 mg/ day
- Copper 2.0 mg / day

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