

ORIGINAL ARTICLE

## ETIOLOGY OF TINNITUS

Assessment of 100 Patients

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### Abstract

*A systematic approach was adopted for 100 patients complaining of tinnitus. They were all called to a special clinic where questionnaire forms were given to them to complete. Later patients were questioned for any further details required, particular emphasis was on drug toxicity, acoustic trauma, head trauma etc. An assessment of anxiety is important in evaluating tinnitus. This was followed by systemic, local, vascular and neurological examinations. Various audiological, blood and radiological investigations were performed depending on the requirement of a particular patient. Twenty four different pathologies were established in 100 patients. Forty eight per cent of cases were diagnosed by history only. Forty four per cent of the cases were due to Acoustic Trauma, dysfunction of Eustachean tube, drug toxicity or head trauma. In 64% cases anxiety and stress were present. Pulsatile tinnitus was present in 7 patients. In spite of all the efforts, in 16 patients no etiology could be detected.*

*Key Word = Tinnitus.*

### Introduction

Tinnitus is objective or subjective. Subjective tinnitus is only felt and described by the patient. Objective tinnitus is not only felt by the patient but felt by others as well.

Tinnitus is usually expressed as a continuous sound of a ringing bell, whistle, buzzing, hum of wind<sup>1</sup>.

There are different views about the mechanism of tinnitus. It has been claimed that the tinnitus is connected with the spontaneous activity of the hearing mechanism<sup>2</sup>. Hearing system has the highest spontaneous activity among the sensory systems of human body.

History has the greatest importance in approaching a patient of tinnitus. Information about the tinnitus should be taken in detail from the patient. What sort of sound it is where is it located, its effect on sleep and hearing must all be investigated<sup>3, 4, 5</sup>.

All the patients with tinnitus should undergo a general medical evaluation and neurological examination, audiometry, speech discrimination tests, tympanometry should be carried out on all the patients.

There are various kinds of treatments for tinnitus as medical, surgical, masking, transcutaneous electrical stimulation and biofeedback.

Pulsatile Tinnitus	
Etiology	Number of case
1. Vascular pathology	2
2. Glomus tympanicum	1
3. Glomus Jugulare	1
4. Anemia	1
5. Acute otitis media	1
6. Increased Intracranial Pressure	1
Total	7
Non-pulsatile Tinnitus	
Etiology	Number of case
1. Idiopathic	16
2. Acoustic trauma	16
3. Tubal dysfunction	12
4. Ototoxic drugs	10
5. Head trauma	6
6. Hypertension	5
7. Otosclerosis	4
8. Wax	4
9. Chronic otitis media	4
10. Sudden hearing loss	3
11. Presbycusis	3
12. Diabetes Mellitus	2
13. Simulation	2
14. Meniere's Disease	1
15. Schizophrenia	1
16. Costen's Syndrome	1
17. Tympanosclerosis	1
18. Myringitis	1
19. Hypotension	1
Total	93

Table 3: Etiology of 100 patients with tinnitus.

### Discussion

No pathology has been found in 16 cases. These cases were idiopathic. ENT examination, audiogram and tympanogram, systemic examination, x-rays and biochemistry testings of these cases were normal. These case had no history of use of ototoxic drug and acoustic head trauma. A study of Engelberg and coworkers showed that 30% of cases were idiopathic<sup>6</sup>.

In the idiopathic group, tinnitus was usually bilateral. On the other hand, anxiety in idiopathic group was more significant (Table 4).

In 16 out of 100 cases, chronic and acute acoustic trauma were the cause of tinnitus. Tinnitus was localized in the left ear in most of the cases in this group. In 7 of 16 patients whose tinnitus was in the left ear, due to hunting and shooting training in military service. This situation was due to acoustic trauma which had been exposed more on the left ear than the right ear when there was no ear mask, since the left ear was directly exposed to the gun sound. In this group there was high frequency tinnitus except in 1 case. This condition was harmonious with localization of pathology in the inner ear. Pathology was in 4000 Hz frequency in this group of patients and audiogram was significantly low in this frequency. While this observation was so clear in young patients with acute acoustic trauma. There were pathologies in other frequencies (200 - 3000 Hz) in older patients.

In 12% of cases the cause was tubal dysfunction. This pathology was due to insufficient ventilation of Eustachian tube.

In 10%, the cause was ototoxic drugs; salicylates, streptomycin, furazolidone, quinine, gentamycin were res-

1. Name, sex, occupation, address, telephone no.
2. Have you heard any sounds of whistling, buzzing lasting at least 5 minutes in your head or ears.
3. Where do you most commonly hear this sound, in your head or ears?
4. Indicate how annoying you find these noises in your head or ears?
5. Indicate to what extent the noises in your head or ears affect your ability to lead a normal life?
6. Do you ever get a buzzing or ringing noise in your head or ears that affects your sleep?
7. Do you have impairment in your hearing or deafness?
8. Which sound resembles the sound which you hear in your head or ears?
9. How long have you had this sound?
10. How long does your tinnitus last?
11. Is the tinnitus pulsatile and synchronous with your heart beat?
12. Have you had any head trauma?
13. Have you had tuberculosis or malaria?
14. Did you use any drugs in the past? Are there any drugs you are using at present?
15. When you were in military service, did you have tinnitus with the pistol fire sounds?
16. Have you ever worked in a noisy job?
17. Do you have a feelings that you may receive bad news?
18. Do you get startled or fear suddenly when you hear a knock at the door or when the telephone rings?
19. Do you have a tendency to cry frequently?
20. Can you remember the moment when the tinnitus started?
21. Are there any other complains concomitant with tinnitus?

Table 1: Tinnitus Evaluation Form

**Material and Method**

Between 1986 – 1988, 100 patients admitted to our clinic were included in this study.

Patients had physical examination initially and were given an appointment to be evaluated in detail. Patients who came to appointments were given a questionnaire which has been prepared for this study, Table 1.

After the completion of this form, systemic and ENT examinations were done. Special importance was given to cardiovascular examination.

Heart, head and neck were auscultated. Neurological and norosurgical examination were done.

**Results**

Out of 100 patients, 61 were male, and 39 were females, average age was 39.39 years.

The age distribution and, etiology and assessment of anxiety is shown in table 2, 3, 4 respectively.

Haemoglobin and routine blood counts, urine analysis, urea, krea-tinine, total lipid, cholesterol, trigly cerides, blood electrolytes were investigated. Bilateral Schuller’s and Sten-ver’s radiographs were taken. Where-ever necessary Water’s Views, cervical, skull base x-rays or CT were done.

In the functional examination of hearing audiometric and tympanomet-ric measurements were performed.

In patients with pulsatile tinnit-us, relationship of tinnitus with effort, heart beats, different positions of the head were interrogated.

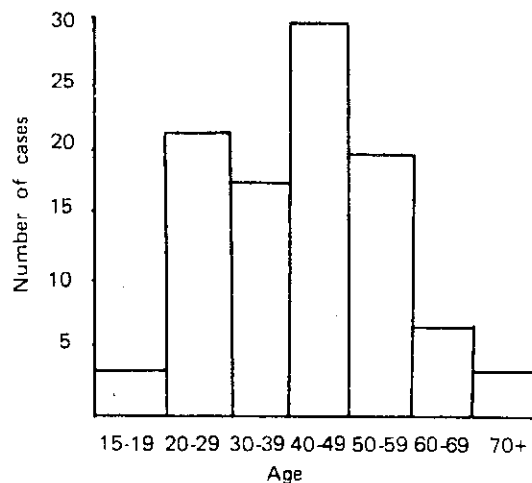


Table 2: Age distribution of tinnitus cases.

In one cases, glomus jugulare and in the other case glomus tympanicum were diagnosed. In one case benign increase in intracranial pressure was diagnosed.

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April 1991

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	Severe	Moderate	Mild	None
1. Idiopathic	11	2	3	—
2. Acoustic trauma	1	2	3	10
3. Tubal dysfunction	1	1	5	5
4. Drug toxicity	1	1	4	4
5. Head trauma	2	1	2	1
6. Hypertension	1	—	1	3
7. Otosclerosis	1	2	2	—
8. Wax	—	—	—	4
9. Chronic Otitis Media	—	2	1	1
10. Sudden hearing loss	1	1	1	—
11. Presbycusis	1	—	—	2
12. Diabetes Mellitus	—	—	1	1
13. Simulation	—	2	—	—
14. Meniere's disease	1	—	—	—
15. Schizophrenia	—	—	1	—
16. Costen's Syndrome	—	—	—	1
17. Tympanosclerosis	—	—	1	—
18. Myringitis	—	—	—	1
19. Hypotension	1	—	—	—
20. Vascular pathology	2	—	1	1
21. Anemia	—	1	—	—
22. Acute otitis media	—	—	—	1
23. Increased Intracranial Pressure	—	—	—	—
Total	24	15	25	36

Table 4: Assessment of degree of anxiety

possible for the pathology.

Ototoxic drugs were particularly harmful to the inner and outer hair cells and organ of corti<sup>7</sup>. Insufficiency of renal functions are specially responsible for prolonging ototoxic effect. However after the administration of even the first dose of drug, ototoxicity might be seen. Previous usage of ototoxic drugs, high fever, and previous deafness also increase the effect of ototoxicity<sup>7</sup>.

Head trauma was found in 1 female and 5 males. Vernon and coworkers believed that tinnitus can start anytime upto 6 months after the head trauma<sup>8</sup>.

In 5% of the patients, hypertension was the cause of pathology, and these patients had mild sensorineural hearing loss.

Patients having otosclerosis described their tinnitus as buzzing, whistling, ringing. In otosclerosis, 2 or more different sounds can be found together. In most patients who have an operation for Otosclerosis the tinnitus disappears when the operation is successful but continues when the operation is a failure.

Irritation originates from crusts adherent to tympanic membrane was the cause of etiology in 4 of the cases.

Chronic otitis media in 4 cases, sudden deafness in 3 cases, and presbycusis in 3 cases were responsible for tinnitus. Meniere's Disease, Costen's syndrome, tympanosclerosis, myringitis, hypotension were also established as cause of tinnitus.

In seven cases tinnitus was pulsatile. Cervical venous pulsations were responsible for tinnitus in 2 out of 7 patients. In one of the patient with pulsatile tinnitus, there was systemic atherosclerosis.