Current treatment for tinnitus

Marco Elisabetsky[1]

[1] Faculdade de Medicina da Universidade de São Paulo, SP, Brasil

Abstract

The text offers a portrait of tinnitus that is both clinical and deeply human: a frequent symptom, multifaceted in presentation and, in many cases, frustrating for patients and clinicians alike. The wide range of subjective descriptions highlights that tinnitus is not merely "a sound", but a sensory and emotional experience that can intrude into silence, disrupt sleep, and erode attention. The most sobering point is uncertainty: in most cases, no clearly demonstrable cause is identified, shifting the emphasis from "curing" to "managing" with prudence and realism. The statistics underscore the collective dimension of the problem, while the discussion of frequency ranges and typologies suggests that measurement and classification help structure care without flattening individual suffering. Regarding treatment, the text traces a historical sequence of attempts, including masking, anticonvulsant drugs, biofeedback, and electrical stimulation, each offering partial benefits and concrete limitations, including adverse effects. Ultimately, it argues that understanding tinnitus requires integrating body, environment, and mind, and that relief may be as valuable as explanation. *Note: this text is a modern, commemorative adaptation, written to mark the 40th anniversary of the first two articles published in the journal Acústica e Vibrações (Acoustics and Vibrations Journal) No. 1 in June 1985.*

Keywords: tinnitus, hearing loss, environmental noise, masking, biofeedback.

PACS: 43.64.Wn, 43.66.Dc, 43.50.Qp.

Tratamento atual de zumbido

Resumo

O texto constrói um retrato ao mesmo tempo clínico e humano do zumbido: um sintoma frequente, multifacetado e, muitas vezes, frustrante para pacientes e profissionais. A diversidade de descrições subjetivas evidencia que o zumbido não é apenas "um som", mas uma experiência sensorial e emocional, capaz de invadir o silêncio, comprometer o sono e deteriorar a atenção. O dado mais duro é a incerteza: a maioria dos casos não tem causa claramente demonstrável, o que desloca o foco do "curar" para o "manejar", com prudência e realismo. As estatísticas reforçam a dimensão coletiva do problema, enquanto a discussão sobre frequência e tipologias sugere que medir e classificar ajuda a organizar o cuidado, sem reduzir a singularidade do sofrimento. Nos tratamentos, o texto revela um percurso histórico de tentativas: mascaramento, fármacos, biofeedback e eletroestimulação, cada qual oferecendo benefícios parciais e limites concretos, inclusive efeitos adversos. Em última instância, a mensagem é que compreender o zumbido exige integrar corpo, ambiente e mente, e que aliviar pode ser tão valioso quanto explicar. *Observação: este texto constitui uma adaptação moderna e comemorativa, elaborada por ocasião dos 40 anos dos dois primeiros artigos publicados na revista Acústica e Vibrações nº1 em junho de 1985.*

Palavras-chave: zumbido, hipoacusia, poluição sonora, mascaramento, biofeedback.

DOI: 10.55753/aev.v40e57.321

1. CLINICAL PRESENTATION AND ETIOLOGICAL CHALLENGE

One of the most disappointing realities routinely faced by otorhinolaryngologists in clinical practice is the presence of patients who complain of tinnitus, with or without hypoacusis (hearing loss). In the past, countless treatments were attempted, with inconsistent outcomes, leading to their gradual abandonment. Unfortunately, tinnitus with a well-established cause accounts for only 15% of the cases seen in outpatient practice; 85% of tinnitus cases have no known cause, and in some instances the cause is merely suspected, without any scientific confirmation[1].

2. MAIN CAUSES OF TINNITUS

The main causes of tinnitus at present are:

1. Noise pollution: this is the cause associated with the largest number of patients. Tinnitus is, in fact, a warning to the patient who frequents environments with intense noise that their auditory system is being strained by excessive sound exposure. It may disappear if the patient moves away from that environment; however, it may become permanent, increasing in intensity, if the patient continues to be exposed to intense noise without adequate protection;

2. Drugs: numerous drugs and pharmaceutical products have already been identified in well-conducted laboratory studies as responsible for triggering tinnitus; and

3. Head trauma: blows to the head—especially those resulting from traffic accidents—have, in recent years, become one of the most important factors in triggering tinnitus. (Brazil has been reported to rank among the countries with the highest numbers of road traffic accidents).

[1]This text is a modern and commemorative adaptation, prepared on the occasion of the 40th anniversary of the first two articles published in Acoustics anf Vibration Journal (*Acústica e Vibrações*) no. 1 (June 1985) [1].

3. SUBJECTIVE DESCRIPTION OF THE SYMPTOM

Subjectively, tinnitus has been described in a wide variety of ways: whistles, crickets, horn-like sounds, the noise of a jet aircraft engine or of a diesel-engine truck, the sound of strong winds, ocean waves, static or pulsatile noises, bell-like or musical sounds, "grinding" noises, sounds resembling birds or animals, string-instrument-like sounds, thunderous noises, etc.

4. REPORTED STATISTICS

American statistics are striking: in 1968, the National Institutes of Health reported 32 million Americans with tinnitus, of whom 7.2 million suffered from disabling tinnitus (preventing study, impairing concentration, disrupting sleep, etc.). Current estimates indicate 40 million individuals with tinnitus, of whom 10 million have disabling symptoms.

5. CLASSIFICATIONS AND CHARACTERIZATION OF TINNITUS

Regarding type, Vernon's statistics from the Kresge Hearing Research Laboratory indicate that 59% of patients report tonal tinnitus (usually high-pitched), 25% classify it as noise, and 16% as a combination of tone + noise.

In 1960, Reed established a classification to assess tinnitus severity, considering three (3) types:

a) Mild: not continuously present; it is perceived more intensely in quiet environments and is easily tolerated by patients.

b) Moderate: constantly present; it is perceived more intensely in quiet environments, and it is disruptive for the patient, preventing them from thinking and sleeping.

c) Severe: highly disturbing; patients complain that they cannot concentrate, as they are constantly thinking about it.

6. FREQUENCY DISTRIBUTION

With respect to frequency, statistics indicate that most tinnitus is located in the mid-frequency range. In a study of 513 patients, Vernon found that 63% presented tinnitus between 2,000 and

7,000 Hertz, 21% below 2,000 Hertz, and 16% above 7,000 Hertz.

7. CURRENT TREATMENT OF TINNITUS

Four methods are currently used for tinnitus treatment: masking, anticonvulsant drugs, biofeedback, and electrical stimulation.

Masking: Patients who have used hearing aids for many years report that, with their use, tinnitus improves or disappears. It was Jack Vernon, from the Kresge Hearing Research Laboratory, who revived this method by developing the masker, which is similar in all respects to a behind-the-ear hearing aid; the intensity of the masking signal remains under the patient's control. The electronics industry has been manufacturing maskers that generate increasingly specific narrow-band noises for the various tinnitus types identified in patients. For patients with hypoacusis, a hearing aid with an integrated masker is used.

Anticonvulsant drugs: In 1978, Melding and Goodey, from New Zealand, published a study on the effect of lidocaine (previously used for pain control) on tinnitus in prison inmates who also had hypoacusis. They then began using long-acting anticonvulsant drugs and selected phenytoin and carbamazepine. In an initial study with 125 patients previously tested with lidocaine, they obtained a 62% improvement in Group I (positive test in both ears) and a 52.8% improvement in Group II (partial improvement with lidocaine). After discontinuation of the drug, tinnitus returned after 2 to 3 weeks in most patients. As these drugs affect hepatic function, their use is time-limited. Another oral drug, tocainide, was also tested and showed the same drawbacks regarding liver effects.

Biofeedback: A term defined by the mathematician Norman Wiener as "... *a method for controlling a system by reintroducing into it the results of its previous experience*". Objective biofeedback information provides the individual with a set of cues that allow them to correlate conscious sensations with unconscious bodily physiological processes. Grossan and House applied it with relative success, enabling patients to better understand tinnitus and making it less disabling.

Electrical stimulation: Known since Volta's invention of the battery (1800), electrical stimulation was revisited in scattered experiments by Hatton *et al.* (1960) and by Aran (Bordeaux). Shulman developed an electrical stimulator consisting of a carrier wave (60 kHz) and a modulating signal (200 Hz to 20,000 Hz), with which he reported improvement in approximately 50% of cases.

NOTE (*JUNE 1985*)

* *Marco Elisabetsky is an attending physician at the Otolaryngology Clinic of the School of Medicine of the University of São Paulo, working under Prof. Lamartine Paiva, and Director of Hospital Israelita Albert Einstein.*

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TRIBUTE TO MARCO ELISABETSKY

Marco Elisabetsky was an otorhinolaryngologist with a distinguished career in São Paulo, SP, affiliated with the Otorhinolaryngology Clinic of the University of São Paulo School of Medicine (FMUSP). He is remembered for his contributions to specialised care, professional training and the organisation of leading medical institutions in Brazil. Throughout his academic career, Marco Elisabetsky served as an attending physician at the FMUSP Otorhinolaryngology Clinic, within Prof. Lamartine Paiva's service. In this context, he took an active role in teaching and clinical activities, contributing to the training of otorhinolaryngologists in a high-complexity university setting.

A milestone of his institutional contribution was his active participation in the project that culminated in the construction of Hospital Israelita Albert Einstein, in São Paulo, SP, Brazil. Colleagues' accounts emphasise his involvement in the early stages of the undertaking, as well as his subsequent service as hospital director. Over time, the hospital consolidated itself as a national and in-

ternational reference in healthcare delivery and health management, a context in which his collaboration is remembered with distinction.

In addition to his clinical and institutional work, Marco Elisabetsky maintained a relevant scientific output in otorhinolaryngology, with particular interest in tinnitus. In an article published in the *Revista Brasileira de Otorrinolaringologia*, he discussed tinnitus treatment, analysing the diagnostic and therapeutic possibilities then available and systematising the state of knowledge at the time. His participation in other contributions to the field further reflects his commitment to scientific updating and to disseminating fundamental concepts for clinical practice.

His technical and scientific leadership also manifested through his engagement in congresses and medical societies. Contemporary documents record his participation in national otorhinolaryngology congresses, including organisational roles at important moments for the consolidation of the specialty in Brazil. In activities promoted by medical associations, his name appears in connection with lectures and scientific meetings, reflecting professional recognition and active dialogue with emerging themes, such as sleep medicine.

Having passed away in May 1995, Marco Elisabetsky left a legacy that combines academic solidity, institutional commitment and lasting technical contribution. Colleagues' accounts and historical records attest to the respect and admiration he earned within the medical community. His memory remains linked to qualified otorhinolaryngology practice, the strengthening of healthcare institutions and a steadfast commitment to teaching and continuing scientific development.

– Biographical text by William D'Andrea Fonseca.