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*Book Reviews*  
*Évaluation des ouvrages écrits*

**Tinnitus: Treatment and Relief (1998)**

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About twelve million Americans and roughly 1 million Canadians have quality-of-life compromising tinnitus. Is this tinnitus treatable? That question is the topic of this edited book that contains a collection of 24 chapters written by active tinnitus researchers and professionals. Two main themes characterize the contents: critical evaluation of proposed treatments, with special emphasis on those that have been used for some time, and descriptions of some relatively new treatments. Much emphasis is placed on psychological treatments. Each chapter has a question and answer session that rephrases, in lay person's language, some of the topics discussed.

In the first chapter, Axelson discusses how "cures" of tinnitus have to be evaluated, especially in those cases that do not have a vascular or middle ear origin (which can generally be treated surgically). Controlled studies with proper statistical evaluation can be used especially to evaluate drug treatments by comparing the proposed drug with the action of a placebo. Such studies have in the majority of cases

put the exaggerated claims of the open studies (patient knows that the prescribed drug is a "cure") into a more humbling perspective. Controlled studies can also be used to test the "magical" workings of magnetic or electrical stimulators. Not all treatments are amenable to a controlled study; only those that have a fairly large percentage of apparent success in open studies can be subsequently tested in controlled studies. One is thus cautioned about the usefulness of publishing results limited to open studies, however, what is more important is to recognize the type of study that is presented in the literature. If it is not a controlled study a more than healthy amount of skepticism is warranted.

Coles takes up the same issues but encourages an open mind to potential promising results. Then he suggests not to place too much emphasis on prescribing abstinence from the more pleasurable aspects of life provided by coffee, tea, alcohol and tobacco as their impact on tinnitus has not been universal. The simple suggestion is that if an effect is suspected one should withdraw from use for a few weeks and if the tinnitus improves see if resumption of the use of these recreational drugs actually re-induces tinnitus or makes the still existing tinnitus one worse. I only wonder whether one's addiction allows such a test procedure. Three long promoted treatments for tinnitus are subsequently debunked: magnets in the ear canal, the use of lidocaine (for long-lasting relief), and the use of ginko balboa. None of these have survived controlled studies. The question and answer session focuses on anecdotal reports

of benefits from certain treatments. The answers are wise: if it works for you by all means use it but do not expect it to work for your neighbor.

The chapter by Schleuning on medical aspects of tinnitus ("tinnitus is a symptom not a specific disease") details the difference between objective tinnitus (the tinnitus that can be heard also by the investigator) and subjective tinnitus. The co-occurrence of tinnitus in cardiovascular disorders, metabolic and neurological diseases, and dental problems is outlined. The importance of pharmacological (aspirin, quinine) and psychological factors (fatigue and stress) is described. I found the question and answer session for this chapter particularly informative as it relates tinnitus to common otologic factors.

The next set of chapters deal in one form or another with the drug treatment of tinnitus. This treatment comes in two forms: those designed to relieve the psychological aspects of tinnitus and those designed to interfere with neural activity generation in the auditory system. Brummett discusses the effects and safety of drug treatments and specifically focuses on potential benefits of benzodiazepines. One such drug (Xanax) was extensively tested in a controlled study and concluded to be able to relieve tinnitus. Side effects such as drowsiness and potential addiction worries offset some of the benefits. Dobie and Sullivan take a deep look, in the form of a controlled double blind study, at tricyclic antidepressants and their effects on tinnitus. Whereas most antidepressants reduce

depressive symptoms, they hardly ever have any effect on tinnitus. The most important sentence of the chapter is that "placebo effects can be very strong in depressed tinnitus patients". The chapter also features a set of screening criteria for depression, unfortunately without an interpretational key. A list of antidepressants, their common medical problems and a list of drugs that interact with tricyclic antidepressants is also provided. This is a useful chapter for the diagnosing physician.

Guth et al. evaluate the use of diuretic furosemide in the treatment of tinnitus. This is one of those anomalies in the field of tinnitus treatment. Furosemide in itself is an ototoxic drug that lowers the endolymphatic potential, the voltage that drives the currents through the hair cells and provides the exquisite sensitivity to the hearing system. A large group of patients, that were first screened for the required sensitivity to furosemide, has been tested in open trials with about 50% success. A controlled study would be fairly difficult because if one were sensitive to this drug one would immediately know if one had received a placebo or not. Denk et al. wanted to reduce the abnormal spontaneous activity (tinnitus) generated in the auditory system by selectively interfering with the effect of glutamate on post synaptic neurons. One immediate drawback is that this does not limit the action to the auditory system but suppresses potentially large parts of the central nervous system, resulting in headaches, dizziness or unusual tastes in the mouth. As in all open studies, the success rate was high at around 70%.

Walger and colleagues studied the effect of low power laser illumination of the mastoid combined with intravenous

gingko extract in a controlled study. Contrary to the reported effectiveness of such treatments in open studies (yielding 60% success rate) the authors could not confirm any effectiveness of the therapy. This is another perfect example that well conducted controlled studies are needed before any judgement on therapeutic use can be made.

Two chapters deal with the suppression of tinnitus by electrical stimulation, either applied extra or intracochlearly (i.e., via a cochlear implant). Staller documents the "long and twisting" history of the use of electrical stimulation to relieve tinnitus. This chapter is a good read with the conclusion that cochlear implants usually work and that other ways of delivering current have been unpredictable with variable or largely undocumented effects. Ito and Sakahihara report results in 20 patients (18 with tinnitus) that received a cochlear implant for which 83% obtained relief of their tinnitus.

Five chapters consider the psychological treatment of tinnitus by using cognitive therapy, biofeedback, relaxation training, counseling, and hypnosis. What the treatments have in common is to teach people to cope with the tinnitus and other tinnitus-induced life stresses. Helping patients change their way of thinking about their tinnitus can do this. This is a time intensive procedure that often requires weekend workshops. Stress management is front and center in biofeedback control and relaxation therapy. Reid, a tinnitus sufferer himself, presents as it were, the psychological problem from the inside with an emphasis on becoming aware of the tinnitus and what may enhance it.

Masking of tinnitus has always (at

least for most of this century) been a favorite way of refocusing the attention of the tinnitus sufferer. Johnson provides the necessary background and details the somewhat variable but still valuable effect that tinnitus maskers have on patients. This chapter also contains, as an appendix, an extensive set of forms intended to get the history of the patients' tinnitus, hearing problems, noise exposure history and medical history as developed by the Oregon Hearing Research Center. Von Wedel et al. present a six-year longitudinal study in nearly 800 patients with severe to disabling chronic tinnitus on the effectiveness of tinnitus-maskers and hearing aids. The results show a stable benefit to most users as long as they wear the device. Long lasting residual inhibition could not be demonstrated.

The end of the book covers a series of specialized issues. The one that I will discuss is the newest of the tinnitus management therapies advocated by Jastreboff and Hazell. The therapy has its inspiration in the recently discovered plasticity of adult human brains, suggesting that tinnitus is plasticity gone wrong. The brain compensates for non-balanced inputs from lower auditory centers and in the course of that process institutionalizes, as it were, tinnitus as a legitimate activity of the brain. The therapy aims at teaching the brain to pay less and less attention to this tinnitus. For that purpose a distracter signal in the form of a low intensity noise is provided together with extensive counseling. Paying less attention to tinnitus may also lower the emotional value addressed to the tinnitus. So this is not a cure but a potential way to induce relief. So far the results are very encouraging. But as



one patient who took the treatment told me, "every time I am (involuntarily) exposed to loud sounds, the tinnitus just flips back and I have to start all over again". Time will tell what the merits of the method are.

Who should read this well produced book? All hearing professionals should give it a try. Most chapters are well written, most are short, some have the right length for bed-time reading but typically pack too large an amount of information in it for that purpose. Making notes

while reading is often needed. Its main purpose is to inform you in dealing with tinnitus sufferers. I would recommend it also to audiology students or to their professors to use in a specialized class or just for demonstrating the differences between open studies and controlled studies in an audiology-related field. Tinnitus sufferers would benefit from reading the psychological chapters; they would probably be depressed by the many studies that show that most tinnitus treatments do not work. But as

long as we do not know where tinnitus originates, where exactly in the brain it is manifesting itself and what the molecular mechanisms are, we are far removed from a cure. The closest treatment to a cure is currently the cochlear implant with its capacity to stimulate previously reorganized parts of the cortex, a plastic reaction to unbalanced input, and to provide a new cochleotopic map in the cortex that sufficiently matches the one in normal hearing subjects. This is a promising neurophysiological approach.