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TINNITUS

Tinnitus is the perception of sound that originates from the body, and has been referred to as head noise or ringing in the ear. Affecting a large percentage of the population, especially the elderly, it is frequently dismissed as a symptom about which little can be done. However, recent research has shed new insight into the disorder. Tinnitus has been classified into several different types based on cause. Several systemic diseases have been identified which may have tinnitus as their presenting feature. The nature and cause of tinnitus has been more identified, and finally, several new treatment options exist.

There are two main categories of tinnitus. Objective tinnitus is the result of sounds that are generated in the body (usually nearby blood vessels) and can frequently be heard by an observer. Subjective tinnitus is an individual's perception of sound that cannot be heard by an observer. The latter type is most common, and is thought to be caused by an abnormality in the auditory pathways between the ear and cortex of the brain.

Objective tinnitus is usually caused by blood vessel abnormalities close to the ear. It may pulsate with the heartbeat, or may be a steady hum. Reasons for this can range from a heart murmur, aneurysm, or narrowing of the arteries in the neck, to malformations in a network of blood vessels and tumors known as glomus tumors. Occasionally the sound may be a clicking noise and may represent a problem with the jaw joint or muscles of the palate or eustachian tube.

Subjective tinnitus, on the other hand, has less apparent reasons. Some individuals complain of a low-level sound that occurs only occasionally, while others complain of a roaring noise on a steadier basis. Descriptions of noises have included rushing, roaring, ringing, whistling, a "cricket" noise, or a "jet engine" noise. Most adults will experience at least a low-level tinnitus of this type temporarily, which will rapidly fade away as attention is turned to another sound. For the most part, this kind of low-level tinnitus is not of great concern. More persistent tinnitus, louder in nature, particularly if isolated on one side and associated with hearing loss and balance problems, warrants an evaluation to rule out other diseases such as tumors of the cranial nerves, blood vessel problems, and a balance problem known as Meniere's Disease.

Several non-tumor entities are known to cause subjective tinnitus, including noise exposure (most common), and exposure to certain medications. The noise is typically a loud sudden burst (impulsive) such as a shotgun blast and causes an immediate tinnitus, which gradually fades. Medications known to cause tinnitus include aspirin, certain antibiotics (aminoglycosides), Lasix, quinine, indomethacin, Tegretol, certain antidepressants (tricyclic type), tetracycline, blood pressure medications, and psychiatric drugs. Frequently, tinnitus can be reduced by reducing or eliminating the dosage of an offending medication. Caffeine, tobacco, and alcohol can also increase tinnitus and should be eliminated.

Exact reasons for the subjective type of tinnitus are unclear. Some researchers feel that there is an altered relay of electrical information from the region of the brainstem to the higher levels of the brain. Earlier theories of increased firing of the hearing nerve fibers have been disproved. Some researchers feel that compression of the hearing nerve

by blood vessels at the brainstem can be responsible and advocate decompressing these vessels. Still others have felt the tinnitus could be generated by an altered electrical discharge in the brainstem.

While proving the cause may be a difficult task, completely getting rid of tinnitus may be even more difficult. Several modes of treatment have been tried, including medical devices, medications, and surgical treatment.

Medical devices work on the theory that if a noise is given to the ear that is similar in quality to the tinnitus, the discomfort from tinnitus will be reduced after the noise is stopped. This theory, known as fatigue, has been tried with varying success with masking devices. These devices can range from something as simple as ocean noises on a tape recorder, to more specific in the ear noise generators (resembling hearing aids) matched in frequency and sound level to the tinnitus. Frequently, something as simple as a hearing aid can reduce the discomfort of tinnitus, perhaps because it amplifies background noise. In fact, hearing aids have been found to be effective in many patients.

The use of medications has been met with some success. Frequently patients who are most bothered by tinnitus also have high levels of stress, anxiety, or depression. A brief history or psychological survey can provide information regarding this. Medications that work well with anxious patients include the benzodiazepine class. These also have the direct action on the central nervous system of increasing the inhibition action of a certain neurotransmitter known as GABA, which is decreased in patients with tinnitus. The downside of using these medications is that they are addictive and sedating. Antidepressant use (with tricyclic antidepressants) can also be beneficial and is more widely accepted than benzodiazepine use. It can however occasionally cause an increase in the tinnitus.

Some physicians have used anticonvulsant medications with the theory that irritability of the nerve is responsible for the tinnitus. Several of these drugs have been found to be unacceptable and impractical for use in tinnitus. Many have been shown to be ineffective in large studies when compared to other drugs and have potentially serious side effects.

Surgical treatment of tinnitus is largely reserved for certain patients. This includes those who have compression of the hearing nerve by a blood vessel, Meniere's disease patients not improved by medications, vascular problems such as aneurysms, and patients with tumors such as acoustic neuromas, arteriovenous malformations, and glomus tumors. Patients with Meniere's disease have improvement of tinnitus between 50-70% of the time after undergoing a balance (vestibular) nerve division.

Other therapies such as biofeedback, electrical stimulation, and psychotherapy have had variable success, but large studies are lacking in proving their efficacy. Recently, there has been great interest in hypnosis and acupuncture. Hypnosis for tinnitus, like smoking cessation, has had mixed results. Some people are difficult to hypnotize, while others may have only temporary relief. Acupuncture is less understood and poorly described from a physiologic standpoint in "Western" medicine, but has had success with certain patients.

Despite advances in the classification, diagnosis, and treatment of tinnitus, there is no completely effective means of curing the disorder. What is most important is diagnosing an underlying disorder for which tinnitus may be a warning sign. If no obvious cause exists, effective treatment options still exist. Treatment is rendered on an individual basis. Advances continue to be made in the field, and medical and surgical treatment will become more specific. Future progress will be made in the realm of masking devices, patient education, and proper diagnosis. Overall, there is definite hope in an area that was formerly dismissed as unimportant and untreatable.