

HEARING LOSS AND TINNITUS IN MENIERE'S DISEASE

Dr Celene McNeill Audiologist Healthy Hearing and Balance Care 1204/1 Newland Street Bondi Junction NSW Tel 02 93873599 www.healthyhearing.com.au

Hearing Loss and tinnitus are two amongst the four symptoms of Meniere's disease. The severity of these symptoms and the strategies to cope with them vary according to the stages of the disease.

Hearing loss may be the first symptom but it is mostly ignored until the first attack of vertigo occurs. Tinnitus is usually considered more troublesome than the hearing loss but vertigo is the most disturbing of the symptoms.

Hearing

A normal human ear can hear frequencies (tones) that vary from a very low pitch of 20 Hz (Hertz) up to a very high pitch of 20,000 Hz. Speech and meaningful environmental sounds are mostly within the 250 to 8,000 Hz frequency range. Hearing testing, known as audiometry, checks the softest sound a person can detect at different frequencies. Someone with normal hearing can hear sounds as soft as 0 - 20dB HL (decibels hearing level). Normal conversational speech is about 60dB HL, while whispering voice is around 20dB HL.

Hearing Loss

Hearing loss is classified as mild when the softest sound one can hear is in the 25 - 40dB HL range, moderate from 45 - 65dB HL, severe from 70 -90dB HL and profound greater than 90dB HL.

The configuration of the hearing loss is also characterised and described according to the frequencies affected. In the initial stages of Meniere's disease the hearing loss affects the lower frequencies so that it is described as a low frequency or reverse slope hearing loss.

Recruitment is also a characteristic of a hearing loss caused by a cochlear dysfunction such as Meniere's disease. The damage to the cochlea caused by the disease also makes the ear more sensitive and intolerant to loud sounds, a condition known as recruitment. Paradoxically soft sounds cannot be heard and loud sounds are uncomfortably loud.

Hearing loss is usually not the main concern of people with Meniere's disease as it is not as debilitating as the vertigo and balance disorders caused by the insult to the vestibular system. Medical management usually prioritises vestibular symptoms over hearing loss and tinnitus.

The hearing loss may be overlooked leading to unnecessary communication problems and increased stress levels. Stress is known as one of the main aggravators of Meniere's symptoms, including tinnitus and vertigo.

Tinnitus

Tinnitus is a noise that one hears in their ears or in the head which it is not attributed to an external sound. It emanates from within the person's body. It is a symptom of a variety of causes and it is mostly but not always associated with an ear disorder.

The diagnosis of tinnitus is mostly based on the person's subjective report. There is no objective test for tinnitus and clinical tests are also subjective measures of pitch and loudness of the sound which closest match the tinnitus percept.

Tinnitus in Meniere's disease is caused by the damage in the cochlea and it varies in quality and loudness. The most common reported sounds are roaring, buzzing and hissing noises varying from very soft to very loud. Some people also hear their pulse in the affected ear.

Tinnitus management

Tinnitus perception is best managed by the fitting of appropriate hearing aids. As a rule, if tinnitus pitch falls within the range of amplification provided by the hearing aid it will be masked. Otherwise tinnitus will be perceived softer or the same with the hearing aids on. In any case the effects of amplification in reducing the stresses of communication will also contribute to provide tinnitus relief.

Those who cannot get satisfactory relief from their tinnitus distress by means of well fitted hearing aids may consider further professional intervention. Customised music based tinnitus therapies with an audiologist as well as mind-full meditation and other interventions by a psychologist are also helpful.

Impact of hearing loss and tinnitus in the three stages of Meniere's disease

In Stage 1 hearing loss affects only the lower tones and does not unduly disturb the person's life. The exceptions are those who have Meniere's disease in both ears. In this case hearing aids may be required to minimise the handicap.

Tinnitus in stage 1 can be overwhelming for some people and it is possible to reduce its perception by listening to gentle music via a personal music player and using thought diversion techniques. However, the presence of tinnitus in the earlier stages of MD may be the indication of an upcoming vertigo attack. It may be therefore useful to listen to the changes in tinnitus signal as a "friendly" warning of an upcoming attack.

In stage 2 hearing no longer returns to normal levels. The hearing loss now affects not only the lower frequencies but the mid and higher tones as well. It still fluctuates, some days it is better than others, but there is a permanent loss of hearing. This hearing loss will cause difficulties in localising sounds as well as following conversation in situations with background noise. The problem is aggravated if both ears are affected.

Recruitment (intolerance to loud sounds) is another characteristic of this stage where soft sounds cannot be detected and at the same time louder sounds cannot be tolerated.

Tinnitus usually fluctuates with the hearing levels; it is louder when hearing is worse.

At this stage hearing aids are very useful regardless of whether the disease is in one or both ears. Good quality hearing aids are very helpful at this stage. They will improve hearing ability in group and noisy situations, increase tolerance to loud noises through sound compression and reduce tinnitus perception by enhancing perception of environmental sounds.

The fitting of hearing aids in the second stage is a complex procedure. It requires the expertise of an audiologist who fully understands the extent of hearing fluctuation and its implication in the hearing aid selection for each individual case. A hearing aid with in-situ audiometry capabilities via a portable interface is useful at this stage. It allows the wearers to test their own hearing and re-program their hearing aids as hearing fluctuates.

In stage 3 hearing is severely impaired and the tinnitus is usually very loud. The fluctuation is not as dramatic as in the earlier stages and may not even be noticed. Residual hearing is distorted and in many cases the person is under the impression that the affected ear is completely deaf. This perception in most cases is incorrect as there is usually some remaining hearing. The hearing loss at this stage affects all frequencies and the softest sounds detected are around 70 dB HL

Properly fitted hearing aids with a volume control are useful to improve hearing ability and reduce tinnitus perception.

Adjustment to the hearing aid may take longer if the person has not worn amplification during the earlier stages of the disease. Results become progressively better as the brain acclimatises to the amplified signals coming from the hearing aid.

Cochlear implants are the last resort to improve hearing in stage 3 for those who no longer benefit from hearing aids. Cochlear implants are hearing aid like devices which are also worn behind the ear but with the difference that there is an internal component surgically inserted into the cochlea. The internal part is an electrode array which stimulates the nerve fibres based on the information received from the external sound processor which, like a hearing aid, is powered by batteries. The

main difference is that hearing aids stimulate the ear with an amplified acoustic signal and the cochlear implants by-passes the ear stimulating the auditory nerve with an electric signal.

Enhancing hearing ability through well-fitted hearing aids or cochlear implants helps to decrease stress levels by improving communication, reducing tinnitus perception, increasing confidence and promoting self-esteem.