For the past 7 years I have been researching the use of hearing aids for Meniere’s disease. Thanks to a grant from the Meniere’s Support Group of NSW, I was able to complete the study this year. Thanks also to those 50 members of the support group who took part in the study by diligently collecting very useful data.

This research showed that hearing aids are very successful for people with Meniere’s disease providing the individual characteristics of the hearing loss are properly addressed. Hearing rehabilitation by means of hearing aids also showed to reduce tinnitus perception in 70% of wearers and 20% do not hear their tinnitus at all while wearing their hearing aids. The other interesting finding, which still needs further research, is that some people report an improvement in their ability to keep their balance while walking when wearing properly fitted hearing aids.

Everyone with Meniere’s disease has some degree of hearing loss in the affected ear. A great majority has unilateral disease with normal hearing on the opposite ear. Some less fortunate have bilateral disease so that a hearing loss is present in both ears. In either case, there is always a difference in the levels of hearing between the right and left ears. Normal hearing means equally acute hearing to all different frequency sounds in both ears so that symmetrical acoustic signals are sent to the brain from each side of the head. Hearing is a bilateral system and the brain relies on the information from both ears to properly interpret sounds. When there are differences in hearing acuity between the right and left ears, mismatched signals are sent to the brain causing confusion and distortion.

People with hearing loss in only one ear report a range of problems. The most common is the difficulty to follow conversation in a noisy environment. Those with hearing loss in one ear and normal hearing in the other, often say that they can hear in these situations but cannot understand what they hear. The background noise sounds very loud and unpleasant so that they end up avoiding social situations such as parties and restaurants.

Some go as far as wearing an ear plug in the affected ear to feel more comfortable in noisy environments. This only aggravates the problem in the long term, as the ear becomes more and more sensitive to sounds. Earplugs are contra-indicated in the affected ear for everyday situations. When sounds are harmfully loud, such as industrial noise for example, both ears should be protected with earplugs and or muffs to avoid further hearing loss. Earplugs are prescribed for protection not for comfort. Sound avoidance and overprotection leads to sound deprivation, which will only delay the results of any future attempt of hearing rehabilitation.
People with hearing loss due to Meniere’s disease usually perceive loud sounds as extremely loud and even painful. This phenomenon, known as recruitment, is thought to result from damage to the hair cells in the cochlea. Soft sounds cannot be detected because of the hearing loss but louder sounds are perceived as abnormally loud due to recruitment. Hearing aids, when properly fitted to the hearing loss, provide amplification of soft sounds to an audible level and compress loud sounds to a comfortable level promoting clearer and more distinguished hearing.

The other common problem encountered by those with only one good hearing ear is the inability to tell where sounds are coming from. Sound localization is processed in the brain by analysing the differences between the information coming from each ear. If the input comes from one ear only the result is that sounds are always perceived as coming from the side of better hearing. Aiding the impaired ear will improve sound localization.

The most embarrassing trouble caused by hearing loss in one ear is that people tend to unintentionally ignore when someone talks to them on the “deaf” side. They are then wrongly considered to be rude or vague when all they are is hearing impaired in one ear...

Another annoying consequence of a unilateral hearing loss is the development of a sore neck because of constant turning and trying to adjust the head position to maximise hearing from the good ear.

All these subtle (and not so subtle) effects of the hearing loss also contribute to aggravate the balance disturbances caused by Meniere’s disease. The sense of hearing helps to keep us aware of our surroundings and contributes to our balance function as well as our sight and proprioception. An interesting phenomenon, which still needs more research, is that many people notice an improvement in their overall balance when the levels of hearing between both ears are corrected by hearing aids.
ears is when there is an infection in the external ear canal or a whole on the eardrum, but Meniere’s disease is not the direct cause. A perforation of the eardrum created an opening to the middle ear, which is normally air sealed, therefore making this space vulnerable to infections and increased hearing loss.

Some people with Meniere’s disease have a grommet put in their eardrum as part of medical management and they must avoid water in their ears to prevent middle ear infections.

The middle ear is an air filled chamber at the end of the ear canal, on the other side of the eardrum, with three tiny bones articulated to one another. At the other end of the middle ear starts the inner ear, which is encapsulated in the temporal bone - the hardest bone in the human body. The inner ear is separated from the middle ear by the oval and round windows. These windows are membranes similar to the eardrum but much smaller in diameter.

The middle ear is also connected to the back of the nose by the Eustachian tube. This muscle structure regulates the air in the middle ear by contraction whenever there are changes in external pressure. Problems to equalise the ear pressure during an airplane trip, for example, are caused by a blockage or a mal function of the Eustachian tube. Meniere’s disease does not cause Eustachian tube dysfunctions although the two problems may co-exist. The sensation of ear fullness, which is one of the symptoms of Meniere’s, is not caused by the Eustachian tube but rather due to an excess of endolymph in the inner ear, which causes a bulging of the cochlear membranes into the middle ear giving the same feeling. That is why pinch and blowing the nose (Valsalva manoeuvre) helps to equalise the ear pressure in an airplane or going up a mountain but does not change the symptom of ear fullness caused by Meniere’s disease. People with Meniere’s disease should avoid constant attempts to equalise the ear pressure as it does not change the symptom of fullness and may even cause damage to the delicate structures of the middle ear.

The inner ear is the body part affected by Meniere’s disease. It is divided in two portions: the hearing organ named cochlea and the organ of balance known as vestibular. Both organs are connected to each other and filled with two fluids: endolymph, which is rich in potassium and perilymph rich in sodium. These fluids are separate by the Basilar and Reissner membranes forming 3 chambers named scala. Scala tympani and vestibuli are filled with perilymph and the scala media full of endolymph. These membranes also support the nerve cells, the outer and inner hair cells in the cochlea and otoliths in the vestibular organ (see below).
Alteration in endolymph is thought to be the source of all symptoms in Meniere’s disease. Excess of endolymph, described as endolymphatic hydrops, distorts the membranes and disturbs the hair cells in the cochlear and the otoliths in the vestibular system. Such distortion is believed to give rise to the symptoms of hearing loss, tinnitus, ear fullness and vertigo. People with Meniere’s disease are recommended to avoid salt and some times prescribed diuretics to prevent build up or retention of endolymph in the scala media.

The causes of endolymphatic hydrops however are still not clear and it may well vary amongst different people. Researchers believe that a cure for Meniere’s disease will be found when these abnormal changes in endolymph fluid are fully understood. Dr Daniel Brown, in Australia, like other researchers around the world, has been investigating the mechanisms of endolymphatic hydrops in an attempt to find a cure.

At present, managing the symptoms is the best option to improve the quality of life for people with Meniere’s disease. From an audiologist’s point of view, hearing rehabilitation is a very effective means to manage the symptom of hearing loss and tinnitus.

Unfortunately, there is still a current belief that hearing aids are not very helpful to people with Meniere’s disease. There are many people who would greatly benefit from hearing aids but are still avoiding the subject. Even worse, many health professionals still wrongly advise patients with Meniere’s disease that hearing aids will not be helpful to them.

Based on the results of my study I am confident to say that there is no longer a foundation for such belief. Technology has come a long way and hearing loss in Meniere’s disease can and should be addressed as soon as it has been identified. Hearing aids when properly fitted improve ability to hear in background noise, helps with sound localization and reduce tinnitus loudness perception.

References:


