

Hearing Health Hour

Ménière's Disease: Definition, Evaluation, and Intervention

October 17, 2022 | 5pm ET

Here the presenter Wafaa Kaf, M.D., Ph.D., CCC-A, FAAA, answers additional questions we received that we ran out of time to cover in the webinar itself.

- What percentage of individuals diagnosed with Ménière's are bi-lateral?
 - More than 50% (or even 78%) of patients with bilateral disease demonstrate involvement of the second ear at least 2 years after symptom onset in the first ear (Paparella et al., 1984). However, the mean conversion time from unilateral to bilateral disease is 7 years (House et al., 2006). The wide range depends on the “reported” clinical manifestations and the ability of the patients to accurately describe their dizzy spells.
- How much does the classification of Ménière's disease help with treatment plan?
 - Early/acute stage: conservative intervention (dietary and medications both oral and intratympanic injection)
 - Late/advanced stage when there is a hypofunction of the vestibular system, significant vertigo spells, and profound, non-serviceable hearing loss, more invasive intervention/surgical procedure may be indicated. This may be followed by cochlear implantation (helps with hearing and suppresses tinnitus).
- Impact of Aspartame in hearing loss.
 - Aspartame is an excitatory neurotransmitter that also excites brain neurons and increases levels of electrical activity in the brain and auditory cortex, resulting in hearing loss and tinnitus. Consumption of aspartame may also increase the risk of type 2 diabetes, cardiovascular diseases, nonalcoholic fatty liver disease and hormone-related cancers, which are risk factors for inner ear hearing loss and tinnitus.
- Is there any exercise to do when feeling a Ménière's disease attack?
 - Lie down when you feel dizzy until the dizziness passes, then get up slowly.
 - Do NOT close your eyes. Try to focus on an object that isn't moving.
 - move slowly and carefully, get plenty of rest.
 - drink plenty of fluids, especially water, and avoid coffee, cigarettes, alcohol and drugs
 - avoid sudden movement, bright light, or loud sounds, watching television or reading.
 - Vestibular Rehab Therapy and customized exercise are important to retrain the balance system to cope with the problem experienced during attacks or after ablative surgery.

- Ménière's is associated with the kidney disease
 - It is important to note that both the kidney and inner ear have similar structural and functions (nephron in the kidney vs stria vascularis in the inner ear)
 - Jong-Yeup et al (2021) studied the effect of chronic kidney disease (N=2572) on hearing and the association with Ménière's disease. They reported that the incidence of sudden sensorineural hearing loss (SSNHL) was 1.39/year and the incidence of Ménière's disease was 3.64 per 1000 person-years, more in middle-aged adults. <https://www.nature.com/articles/s41598-021-99792-x#citeas>
 - There are several explanations for having these auditory symptoms in patients with chronic kidney disease. These include the risk of cardiovascular diseases; disturbances in water and electrolyte homeostasis; "loop" diuretics and aminoglycosides medications, both are ototoxic and vestibulotoxic; and hemodialysis and renal transplantation may induce electrolyte disturbances and osmotic alterations in the inner ear, resulting in SNHL, tinnitus, and vertigo.
- Does humidity play a role in Ménière's symptoms?
 - Schmidt et al (2017; Otol Neurotol) collected data from 397 individuals (277 females and 120 males with an average age of 50 years old) from the UK. They reported that Ménière's Disease symptoms (both severity and attack prevalence) were reduced on days when atmospheric pressure was higher (fair, calm weather) and humidity is low, and vice versa.
- Does potassium chloride serve as a substitute?
 - Kamakura et al (2019; Audiol Neurotol) examined the effects of increasing the potassium ion concentration (via intratympanic injection) of the rat perilymph on hearing and nystagmus. Depending on the concentration of potassium chloride (KCl), rats developed spontaneous irritative nystagmus beating to the affected ear and paralytic nystagmus beating to the contralateral ear, and significant, yet temporary, hearing impairment 30 min after KCl injection. These findings are similar to those observed during acute Ménière's attacks
- I would like to know if there is experimental preclinical models for this pathology?
 - Several researchers have studied animal models of Ménière disease (Sami Melki and colleagues, 2010, 2014; Salt & Plontke, 2011; Megerian et al., 2010). But all of these are mainly endolymphatic hydrops model.
- Any suggestions for insomnia from severe bilateral tinnitus from Ménière's disease.
 - Please watch Dr. Richard Tyler's presentation on the HHF Webinar page: <https://hearinghealthfoundation.org/webinar/recordings/measuring-tinnitus-tyler-04-19-21>
 - Do not sleep in a quiet room – have a background noise in the room.
 - During the day, amplification (hearing aids, CROS hearing aid, or even cochlear implantation in ears with profound hearing loss) helps to improve hearing and mask tinnitus.
 - Counseling, education, and cognitive behavioral therapy are valuable reassurance and to retrain the brain Not to listen to the internal noise (tinnitus).

- How effective are cross hearing aids for sound localization when there single-sided hearing loss?
 - Contralateral routing of signal (CROS) hearing aids pick up sounds from the affected side and transmit them via a hard wire or a wireless signal to a hearing aid on the normal ear; however, patients would still have a problem with sound localization on the affected side.
 - On the other hand, osseointegrated mastoid implant with the bone conduction processor helps with sound localization and provides better speech understanding in noise. Cochlear implantation is another option in profound, no serviceable hearing loss. These amplification devices also reduce the perception of tinnitus.
- Since caffeine is a diuretic, why is it recommended to avoid coffee? Wouldn't the diuretic properties be helpful?
 - Caffeine works by stimulating the central nervous system, heart, muscles, and the centers that control blood pressure→ Caffeine can raise blood pressure, increase heart rate & blood flow. Other Side effects: insomnia, agitation, shakes/tremors. Severe side effects may induce Ménière's disease like symptoms, including headaches, anxiety panic attacks, tinnitus, dizziness, and vomiting.
 - Like most drugs, the effects of caffeine will vary from person to person and a person's tolerance to caffeine can increase over time.
- What are correlations between Depression and Ménière's?

Patel et al (2020), using the Zung's self-rating Depression Scale, reported that about 50% of patients with Ménière's disease (N=6587) suffer from depression and about 9% have Dysphoria. The patient may experience fatigue for hours to days post Ménière's disease attack.
- Can Dr. Kaf talk about some of the conditions that may be mistaken for Ménière's, and vice versa? For instance, hearing loss with vertigo is sometimes diagnosed as vestibular vertigo or migraine-associated vertigo. I'd like to hear more about that.
 - There are variants of Ménière's disease. These include Cochlear Hydrops (mainly hearing loss, no vertigo or late onset vertigo), Vestibular Hydrops (Vertigo with no hearing loss), Lermoyez Syndrome (hearing improves as soon as vertigo starts), and Tumarkin's Otolithic Crisis (occurs in 2-6% in Ménière's disease, but there are other causes such as cardiovascular or seizures). One of the main differential diagnosis is vestibular migraine (2%) is characterized by episodic vertigo (sec-days) and migraine headache, intolerance of head motion/motion sickness. Although vestibular migraine can cause tinnitus and ear fullness, hearing loss is mild and not progressive like in Ménière's disease.
- I have seen studies with growing cilia in mice and is that being carried over to humans with any success?
 - Please review this short paper by Gordon Glantz (2022, The Hearing Review). https://journals.lww.com/thehearingjournal/fulltext/2022/01000/gene_therapy_for_hearing_loss_on_the_horizon.1.aspx

- Is there any research delving into a CNS connection since Post Ictal symptoms are present after an attack? CNS meds have helped ameliorate some symptoms.
 - Not sure about research in that area. However, sympathetic nerves are distributed in the arterioles of the inner ear. In Ménière's disease, continuous overstress may cause the sympathetic autonomic nervous system hyperactivity to increase vascular permeability and perivascular inflammation in the inner ear, resulting in progressive and chronic neuroinflammation resulting in functional and structural damage (Ishii et al., 2022; Frontier in Neurology). These lead to SNHL, vertigo, and more perception of tinnitus.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8970286/>

