

Migraine: Making the Vestibulocochlear Connection

By Dennis A. Colucci, AuD, MA

Migraine is not only a bad headache, but also a multifocal neurovascular anomaly that affects central and peripheral motor and sensory function. The effects of migraine include disorientation, nausea and vomiting, dizziness and vertigo, tinnitus, hearing loss, sudden deafness and blindness, and sound, light, and smell sensitivity, in addition to fatigue, weakness, and non-epileptic seizures.

Regarding pathophysiology, there is evidence that neurological activity leads to vascular changes, such as vasospasm and vasodilation (*Am J Otolaryngol* 2012;33[4]:385-394). For example, vasospasm of the cochlear vasculature causes sudden hearing loss in migraine patients, some authors have suggested (*Am J Otolaryngol* 2012;33[4]:385-394). When the hearing loss is temporary, ischemia also may play a role, these authors add.

In patients with the less common basilar-type migraine, the direct consequences to the cerebellum and labyrinth produce brainstem symptoms, including a variety of possible auras.

A range of environmental and genetic factors are thought to cause migraine, which has a lifetime prevalence of about 14.2 percent in the general population (*Headache* 2015; 55[1]:21-34). While migraines occur at approximately the same rates in boys and girls before puberty, in adulthood, 24 million of the 32 million Americans who have migraines are women (*Neurol Clin* 2009;27[2]:503-511), with a genetic component reported in approximately half of the cases.

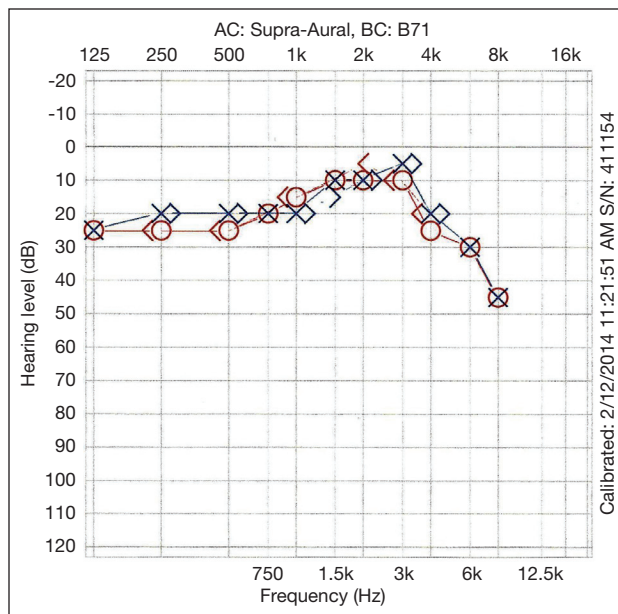
Notably, a reduction in the occurrence of migraines is observed during pregnancy. In some patients, triggers such as fatigue, stress, certain foods, medications, and sleeping patterns have been implicated.

STAGES OF MIGRAINE

Migraines may occur in four phases, starting with mood and body sensations, followed by an aura phase of sensory or motor sensations, then an attack or headache phase with the most severe symptoms, and a final phase of migraine hangover and recovery, according to the Mayo Clinic (bit.ly/Mayo-migraine). The pounding headache can be localized to one side and may last anywhere from a couple hours to a few days.



Dr. Colucci is a clinical and forensic audiologist in private practice in Laguna Hills, CA.



This audiogram was taken from a patient who has cochlear migraine.

In some episodes, there is just an aura. For example, the aura associated with ocular migraine, which is seen as a temporary blind spot in the visual field with scintillations, can exist without a migraine headache.

This phenomenon also occurs for symptoms of hearing loss and tinnitus, with up to 50 percent of vestibular migraine patients denying an associated headache (*Headache* 2013; 53[7]:1123-1133). Remarkably, abnormal vestibular function tests of both peripheral and central origin are found between attacks in migraine patients with or without vertigo.

MÉNIÈRE'S VERSUS MIGRAINE

Although balance complaints are more frequently observed with vestibular migraine, auditory complaints may also arise. These complaints appear to be similar to those auditory symptoms seen in Ménière's disease patients (*Front Neurol* 2014;5:265).

Vestibular migraine and Ménière's disease are the primary causes of spontaneous recurrent vertigo, according to Jose Antonio Lopez-Escamez and colleagues (*Front Neurol* 2014;5:265). In patients with vertigo, the diagnosis is made by not only ruling out competing diseases with appropriate testing, but also evaluating information and symptoms occurring during the vertigo attacks, the authors suggest.



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For example, in Ménière's disease, women are not more affected than men; auditory complaints of aural fullness, hearing loss, and tinnitus dominate; and headaches or migraine symptoms are not historically present, although they do occur in about 40 percent of cases.

In vestibular migraine, on the other hand, migraines occur with the vertigo at least 50 percent of the time, there is a

history of migraine and visual or other auras, and photophobia and phonophobia are frequently associated with the condition.

IMPLICATIONS FOR AUDIOLOGY

The emergence of headache research over the past decade has identified the vestibulocochlear migraine patient as having a specific profile not previously revealed.

The differentiation of various classes of migraine and their comparison with other hearing and balance disorders, such as traumatic endolymphatic hydrops and labyrinthine concussion (*Semin Neurol* 2013;33[3]:238-243), has improved our understanding of best practices for patient management.

When evaluating patients who have a primary complaint of audiovestibular symptoms associated with headaches, auras, or other sensory–motor abnormalities, questions concerning the onset, history, and related symptoms can provide insight into the potential for migraine to be the cause or a comorbid condition. [H](#)

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