
DISORDERS

A.K.A. "DIZZY MIGRAINE"

Approximately 55% of migraine patients have vestibular symptoms.

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Vestibular Migraine

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Summary: Migraine is the second most disabling chronic disorder in the world. Approximately 55% of migraine patients experience vestibular symptoms at one time or another. A large portion of people with vestibular migraine often have no accompanying headache, their predominant symptom instead being vertigo or dizziness. Vestibular migraine must be addressed in the clinical setting through a holistic, multidisciplinary combination of medical management, lifestyle changes, and rehabilitation techniques to ensure the most complete and lasting benefit to the patient.

Migraine is the second largest cause of disability in the world, second only to lower back pain. Migraine affects people in their prime, from their 20s to their 40s. It is typically recognized as a unilateral throbbing or pounding headache, accompanied by photophobia (sensitivity to light), phonophobia (noise sensitivity), nausea and/or vomiting, or aura. Despite efforts to improve public awareness and education, it is estimated that approximately 50% of migraineurs go undiagnosed or mismanaged to this day. Many self-treat or are treated inappropriately for sinus or other non-migrainous types of headache [Lipton, 2001].

However, migraine is more than a headache and can often cause vertigo and dizziness. Vestibular migraine is the most common neurological cause of vertigo among adults. It typically affects women in their 40s, especially those with a previous history of migraine headache [Beh, 2019]. People with vestibular migraine also often have a history of motion sickness and a family history of migraine [Beh, 2019].

Symptoms

Approximately 55% of migraine patients experience vertigo or dizziness at one time or another. Vestibular testing in people with migraine often reveals non-specific findings, like positional nystagmus, saccadic pursuit, and abnormalities of vestibular evoked myogenic potentials. Furthermore, patients with migraine also have a higher risk of multiple vestibular conditions, including benign paroxysmal positional vertigo (BPPV), persistent postural perceptual dizziness (PPPD), Meniere's disease, and mal de debarquement syndrome (MBBS) [Beh, 2019].

The mere presence of vestibular symptoms in a patient with migraine does not make the diagnosis of vestibular migraine. According to the



Barany Society and International Headache Society, the consensus diagnostic criteria for diagnosing vestibular migraine are: (1) at least five episodes of vestibular symptoms of moderate to severe intensity, lasting between 5 minutes to 72 hours; (2) with at least half of these episodes accompanied by at least one migraine symptom, which include (a) headache (with at least two features: unilateral, throbbing, moderate/severe intensity, aggravated by routine physical activity), (b) photophobia and phonophobia, or (c) visual aura; (3) current or previous history of migraine with or without aura; (4) not better accounted for by another diagnosis [Lempert, 2012].

Patients with vestibular migraine often describe a wide variety of vestibular symptoms, including spontaneous and triggered vertigo/dizziness [Beh, 2019]. The reported incidence of headache in vestibular migraine varies widely. Even if present, headache is often less debilitating than the vestibular symptoms [Beh, 2019]. More commonly, photophobia and phonophobia are more frequently encountered [Beh, 2019]. Visual aura is reported by a subset of patients [Beh, 2019]. Although not part of the diagnostic criteria, many other symptoms may occur in vestibular migraine, including neck pain, osmophobia, neuropsychiatric symptoms (e.g., word-finding difficulties, trouble thinking, anxiety, depression), autonomic symptoms (e.g., diaphoresis, dry mouth, tearing, nasal congestion, diarrhea), and visual disturbances (e.g., visual snow, blurred vision) [Beh, 2019].

Vestibular migraine attacks are often provoked by typical migraine triggers, including stress, weather changes, menstruation, sleep irregularities, missing meals, dehydration, bright lights, loud noise, or motion sickness. Furthermore, migraine food triggers like caffeine, chocolate, and alcohol are also well-recognized vestibular migraine triggers [Beh, 2019].

Diagnosis

Traditionally, patients with vestibular symptoms associated are evaluated by neurologists, otolaryngologists, audiologists, physical therapists, and vestibular therapists. Often, patients with vertigo are seen in emergency departments and by their primary care providers.

While vestibular migraine is a clinical diagnosis, patients often and should undergo a battery of tests to exclude other conditions. A brain MRI is essential in all patients presenting with vestibular symptoms for the first time. For those in whom MRI

TRIGGERS FOR MIGRAINE

Note: Some of the triggers below may also apply to other types of vestibular dysfunction.

Food Triggers

- Aged or ripened cheeses (examples: Cheddar, Gruyère, Emmentaler, Stilton, Brie, Gouda, Romano, Parmesan, feta, bleu, Camembert)
- Foods containing large amounts of monosodium glutamate (MSG). Processed foods must list MSG as an ingredient, but they may only say, "flavor enhancer 621."
- Smoked, cured, or processed meats such as bacon, sausage, ham, salami, pepperoni, pickled herring, bologna, chicken livers, and hot dogs
- Food prepared with meat tenderizer, soy sauce, vinegar (except white vinegar), or yeast extract; and food that has been fermented, pickled, or marinated
- Pea pods and pods of broad beans such as
- lima and navy beans
- Onions, olives, pickles
- Alcohol (especially red wine, port, sherry, Scotch, gin, and bourbon)
- Sour cream, yogurt, buttermilk
- Hot fresh bread, raised coffee cake, doughnuts
- Excessive aspartame (artificial sweetener)
- Chocolate, cocoa, carob
- Nuts, peanut butter
- Certain fruits, including figs, avocados, raisins, red plums, passion fruit, papaya, banana, and citrus fruit
- Excessive tea, coffee, cola

Other Triggers

- Hormonal fluctuations
- Barometric-pressure variations
- Sleep disturbance
- Stress
- Medications

Parts of this listing are adapted from Ronald J. Tusa, MD, PhD, "Diagnosis and Management of Neuro-otologic Disorders Due to Migraine," chap. 12 in *Vestibular Rehabilitation*, ed. Susan J. Herdman, PhD, PT (Philadelphia: F.A. Davis Co., 1994).





**50% OF
MIGRAINEURS GO
UNDIAGNOSED.**

is contraindicated, a head CT should be performed. Angiographic imaging (either CT or MRI) of the head and neck can be ordered in the right clinical setting or if there is a concern for a cerebrovascular event (stroke).

Basic vestibular tests (video-nystagmography, bithermal caloric testing, and video head impulse testing) and pure tone audiometry should be performed on all patients. Ancillary audiovestibular testing (e.g. vestibular evoked myogenic potentials, rotary chair, electrocochleography, auditory brainstem responses, computerized dynamic posturography) can be considered in the right clinical setting.

Patient reported outcome questionnaires can help quantify and track a patient's degree of disability and limitation. Questionnaires that are useful include the Dizziness Handicap Inventory, Dynamic Gait Index, Activities-Specific Balance Confidence Scale, Timed Up and Go Test, and others. For those with headaches, the Migraine Disability Assessment (MIDAS) is a useful questionnaire.

Treatment

The best approach to vestibular migraine treatment is a holistic, multidisciplinary plan that encompasses non-pharmacologic nutraceuticals, medications, lifestyle changes, vestibular rehabilitation therapy, and addressing comorbidities.

Non-pharmacologic nutraceuticals are often safe and well-tolerated. Potentially beneficial supplements include riboflavin, magnesium, vitamin D3, melatonin, and coenzyme-Q10. Lifestyle modifications in vestibular migraine should include regular exercise, stress management, consistent meals, and proper sleep hygiene. Trigger avoidance includes restricting one's intake of caffeine, alcohol, monosodium glutamate (MSG), and high-processed foods.

Preventive treatments for vestibular migraine

should be considered in those with frequent or severe attacks that interfere with a patient's ability to function. These include classic migraine prophylactics like antidepressants (e.g. amitriptyline, venlafaxine), anti-epileptic medications (e.g., topiramate, divalproex), beta-blockers (e.g., propranolol, metoprolol, timolol), and calcium-channel blockers (e.g., verapamil). There is emerging evidence that neuromodulation, onabotulinumtoxin and calcitonin gene-related peptide antagonists may also be beneficial in vestibular migraine. The choice of which medication will depend on the patient's comorbidities, preference, and desire to get pregnant.

Rescue treatments can be used for vestibular migraine attacks. There are a variety of rescue treatments that can be deployed as monotherapy or in combination. These include triptans (e.g. sumatriptan, zolmitriptan, rizatriptan), non-steroidal anti-inflammatory drugs (e.g., ibuprofen, naproxen), antiemetics (e.g., ondansetron, promethazine, metoclopramide), antihistamines (e.g., meclizine, diphenhydramine), and benzodiazepines (e.g., diazepam, lorazepam, clonazepam). Neuromodulation and calcitonin gene-related peptide antagonists may also be effective in some.

Vestibular rehabilitation (VRT) specifically for vestibular migraine typically consists of repeated vestibulo-spinal and vestibulo-ocular reflex training. Vestibular migraine patients have a heightened perception of vestibular symptoms and longer duration of vertigo compared to patients who have vestibular disorders without migraine [Vitkovic, 2013]. Patients often need a prolonged period of rehabilitation in addition to ensuring exercise adherence through motivation and emotional support. VRT must be challenging yet gradual and of low enough intensity in order to avoid triggering a migraine event. Patients with visual perceptual deficits benefit from visual acuity exercises which include working on gaze stability via repeated periods of retinal slip to induce vestibular adaptation or employ substitution by other eye movements such as corrective saccades or smooth pursuit eye motion [Han, 2011]. It is important that the velocity of the exercises should be individualized to the patient's tested velocity deficits.

Postural stability training relies on enhancing the visual and somatosensory system in order to help patients learn to use the remaining vestibular function and recover normal postural strategies





TREATMENT INCLUDES A COMBINATION OF MEDICATIONS, VESTIBULAR REHABILITATION, AND LIFESTYLE MODIFICATIONS.

that are efficient and effective. The Clinical Test for Sensory Interaction in Balance effectively assesses the integrity of the vestibular, visual and somatosensory systems in contributing to the patient's postural stability. This in turn informs the treatment approach. Visually-induced vertigo/dizziness is very common in vestibular migraine. Habituation exercises should be used carefully in repeating a provocative movement in order to attenuate the dizzy response. Visually-dependent patients benefit from hand-eye coordination exercises in addition to exposure to visually conflicting stimuli. Patients may practice balance exercises on altered surfaces such as foam if they are dependent on their somatosensory system while working on recovering normal postural strategies such as the ankle strategy.

Vestibular migraine patients often experience comorbid conditions that interfere with their quality of life. Cervical disorders like cervical spondylosis, cervical facet syndromes or muscle spasms that cause pain and reduce range of motion. Addressing these issues via joint mobilization, stretching and cervical/scapula strengthening exercises will help restore normal cervical motion. Mood disorders like anxiety, panic, and depression are also very common in those with vestibular migraine. If treatment with the patient's primary care physician and/or neurologist does not adequately address their mood disorder, the patient should be referred to a psychiatrist. In patients with significant tinnitus, tinnitus retraining therapy, hearing aids, or white noise generators may help.

Summary

Vestibular migraine afflicts a large percent of the population and continues to be a challenge to

healthcare professionals. The diagnosis is often missed and a greater awareness of this condition is needed among healthcare providers. Effective management of VM necessitates a comprehensive effort and active participation of the patient, the treating physician, and the rehabilitation professionals.



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