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## CLINICAL VIGNETTE

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# Vestibular Migraine

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An 83-year-old male with nephrolithiasis, hypertension, hyperlipidemia, and hypothyroidism presents with episodes of vertigo. The episodes started when he was in his 20's and were exacerbated by stress, poor sleep habits, and certain foods including red wine, chocolate, artificial sweeteners, and processed meats. A typical episode starts with a general feeling of unease and tension, and escalates into significant vertigo within 1-2 hours. Some include a mild headache. He had previously normal head MRI and EEG. Current medications include losartan 50 mg daily, levothyroxine 75 mcg daily, and atorvastatin 40 mg daily. He does not take supplements. Surgical history includes lumbar disc fusion and appendectomy. He does not smoke and drinks 1-2 glasses of red wine per night. Family History is significant for coronary artery disease, prostate cancer, and migraines

On exam, the patient was comfortable. Vital Signs included BP 142/72, HR 60/min, T 98.4. His exam was unremarkable, including normal Head & Neck, carotids and normal neurologic exams.

Labs included normal CBC, chemistries, TSH, lipid panel, ESR, and urinalysis.

### ***General Discussion, Epidemiology, and Pathophysiology***

Vestibular migraine, or migraines presenting primarily as episodes of vertigo is poorly understood.<sup>1</sup> The prevalence of this condition is unclear, but has been estimated to affect about 1% of the population.<sup>2</sup> As with other types of migraines, it is more prevalent in women than men.<sup>3</sup> It is also more common in children than adults, although it can be reported at any age. Vertigo is commonly seen in patients with migraines and migraines are commonly seen in patients with vertigo suggesting a common connection between these two conditions.<sup>4</sup> Many children with benign positional vertigo will be diagnosed as adults with vestibular migraine, suggesting that vertigo and migraines may have a common pathway.<sup>2</sup> Interestingly, vertigo is not more prevalent in patients with other types of headaches.<sup>4</sup> Although the etiology and pathophysiology of vestibular migraine are not well understood, possible mechanisms have been proposed. One theory is vestibular ischemia related to migraine may trigger vertiginous symptoms.<sup>5</sup> Another is that migraines may increase the patient's sensitivities to internal sensory stimuli increasing likelihood of vertigo or motion sickness.<sup>6</sup> Another theory suggests a common component of vertigo may trigger migraines in predisposed patients.<sup>7</sup> Finally, others believe that the vertigo

component may represent a migraine aura. The aura is believed to originate in one of the regions in or near the brainstem, and involves dysregulation in the vestibular nuclei or the trigeminal nucleus caudalis.<sup>1</sup>

### ***Clinical Features***

A key feature of vestibular migraines is episodes of vertigo, and possible headache, with no other neurologic symptoms.<sup>2</sup> The vertigo may be described as a feeling of the self-rotating or the external world rotating.<sup>1</sup> Occasionally the vertigo can be reported as a feeling of shakiness, lightheadedness, unsteadiness, or dizziness.<sup>2</sup> The vertigo can occur without a headache, although this is less common. The headache is often less significant than the vertigo, so it is very important to obtain a careful history.<sup>8</sup> The vertigo can occur before, during or after the headache.<sup>9</sup> Many patients do not report a clear association between the vertigo and headache.<sup>9</sup> Vertigo can be spontaneous, positional, visually-induced, or head motion induced.<sup>2</sup> Associative symptoms include photophobia, visual symptoms, nausea, vomiting, fatigue, phonophobia, tinnitus, and hearing loss.<sup>2</sup> Nystagmus is often noted on physical examination.<sup>10</sup> Episodes can last from minutes to several days but the vertigo usually resolves within hours. Most will report one or more episodes per year, although some patients will have episodes every day or every week.<sup>2</sup> Episodes can be triggered by stress, insomnia, certain foods, altitude changes, movement, flashing lights, or loud noises.<sup>2</sup> Anxiety and depression are common in patients with vestibular migraines, but the association is not believed to be causal and patients may commonly report history of motion sickness.<sup>11</sup>

### ***Diagnosis and Testing***

There is no diagnostic test for vestibular migraine, as this condition remains a diagnosis of exclusion.<sup>2</sup> Clinical criteria have been developed for diagnostic purposes.<sup>2</sup> Most clinicians and investigators use the ICHD-3 criteria for vestibular migraines which is based on the assumption that no other known diagnosis better fits the patient's signs and symptoms.<sup>12</sup>

These criteria are:

1. A current or past history of migraines
2. At least five episodes with vestibular symptoms that are of least moderate intensity and last between five minutes and three days

3. At least half of the episodes are associated with at least two of the following characteristics (unilateral, pulsating, moderate or severe intensity, aggravated by routine physical activity)
4. Photophobia and phonophobia
5. Visual aura

Some patients may require audiology evaluation.<sup>9</sup> Older patients or patients with initial episode usually undergo MRI and MRA of the brain.<sup>2</sup> Vestibular testing is usually not needed as part of the work-up.<sup>11</sup> The differential diagnosis includes benign paroxysmal positional vertigo, Meniere's disease, migraine with brainstem aura, ischemic events, medication effects, vestibular paroxysmia, and motion sickness.<sup>13</sup>

### Treatment

The treatment of vestibular migraines is directed at acute attacks and the prevention of future episodes.<sup>2</sup> For acute attacks lasting longer than twenty minutes, vestibular symptoms are treated with benzodiazepines, anti-emetics, and antihistamines.<sup>3</sup> Efficacy of these medications is highly variable.<sup>3</sup> Triptans are not typically used unless the headache component is predominant; in which case this class of medications can be very effective.<sup>3</sup> Preventive strategies rely on a careful history of potential triggers especially foods and drugs. Prophylactic medication can be considered in patients with frequent episodes without clear triggers. Prophylactic medications include tricyclic anti-depressants, gabapentin, topiramate, lamotrigine, valproic acid, beta blockers, and calcium channel blockers. SNRI's can be helpful in cases without significant headaches, but are not usually effective in headache-predominant cases. Acupuncture has been tried in refractory cases with limited success. SSRI's are not effective in most cases of vestibular migraines. Vestibular physical therapy with an experienced therapist can be effective, especially when episodes have a clear physical trigger. Physical therapy can include gaze training and balance exercises.<sup>3</sup>

### Prognosis

The prognosis for patients with vestibular migraine is variable with some having symptoms for many years, and others with improvement over time.<sup>2</sup>

### Clinical Course and Follow-Up

The patient's vestibular migraines were often triggered by stress and certain foods. These foods included red wine, chocolate, artificial sweeteners, and processed meats. The patient eliminated those foods from his diet, began practicing mindfulness techniques, with improved sleep hygiene and noted significant improvement in frequency of episodes.

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