

7 Cases In Non-Vertiginous Dizziness

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Presented at CME for Family Physicians, University of Manitoba, (October 2003).

The prevalence of dizziness ranges from 1.8% in young adults, to more than 30% in elderly patients.¹ Although dizziness is caused by vestibular disorders in more than half of patients, the remainder of cases will be unrelated to inner-ear dysfunction.^{2,3} Almost half of all patients will have more than one condition contributing to their dizziness. Most causes can be readily ascer-

tained with a detailed history and directed physical examination (Table 1).

History

Patients should be encouraged to describe the sensation experienced in their own words. The way a patient describes the dizziness is often key to the diagnosis, even in the face of

Case #1: Jennifer's Dizziness

Jennifer, 41, presents with dizziness, which began abruptly about two weeks ago. She has never suffered any similar symptoms before. There was no known initiating factor. She describes a lightheaded wooziness without environmental motion. She has slight nausea, but no vomiting or headache. Her vision becomes bright and she cannot hear during each episode because her surroundings seem distant. She has a whooshing tinnitus and generalized weakness. Symptoms are episodic and occur at least once daily, lasting seconds to minutes. On bad days, she can have as many as five episodes. Typically, her symptoms occur standing or sitting and appear unrelated to head posture or movement.



Digging deeper

Jennifer gives a past history of fainting in her youth, often in conjunction with her menstrual cycle. She had been hospitalized two years prior with a fast heart beat and had been treated with amiodarone. She had stopped taking the medication because she was told it was a "dangerous drug".

What's the diagnosis?

It is likely that this patient's symptoms are presyncopal. Lightheadedness results from transient cerebral hypoperfusion and is not typical of impending focal cerebral ischemia. Often, a patient will recognize the sensation as an imminent faint.

Symptoms:

- Abrupt onset
- Visual changes
- Vascular tinnitus
- Pallor
- Palpitations
- Weakness

Treatment:

- Remove/modify offending medications
- Hydration
- Exercise
- Support stockings, and
- Eliminate circumstances of event
- Treat the specific underlying cause

Table 1

Causes of non-vertiginous dizziness

- Presyncope
- Migraine
- Psychophysical dizziness
- Ocular dizziness
- Imbalance
- Multisensory dizziness
- Cervical vertigo

a completely normal examination. Certain questions will help guide the examination and, ultimately, the treatment of these patients.

It's all in the interpretation

Patients often have great difficulty in describing their symptoms, particularly if they are not truly spinning or tilting. While vertigo is the illusion of environmental motion, dizziness may be described as "lightheadedness" or "heavy-headedness", as well as "swimming", "floating", or "giddyness". Patients may suffer a "rush" or describe falling or imbalance.

Other symptoms which precede or accompany the dizziness may ultimately lead to the diagnosis. The presence or absence of headache, nausea, vomiting, or diarrhea may suggest migraine or viral infection. Hearing loss and tinnitus imply associated involvement of the cochlea or eighth nerve. Autonomic symptoms, such as pallor and diaphoresis, commonly accompany peripheral vestibular disorders. When these same symptoms are associated with palpitations, changes in visual acuity, or generalized weakness, hypotension, and cerebral hypoperfusion are inferred. Centrally mediated dizziness is suspected when other neurologic symptoms, such as diplopia or oscillopsia, are present.

Case #2: Brianna's Headache

Brianna, 42, presents with a six-month history of dizziness. She describes lightheadedness without environmental motion. She is nauseated and vomits frequently. Symptoms are provoked by motion, typically occurring while she is a passenger in a car or playing video games. Episodes can occur within 15 minutes of



running on a treadmill. She has a long history of headaches, which continue to occur without the dizziness. They are typically unilateral and throbbing. Symptoms will last for hours and have a catamenial exacerbation. Neurologic and cardiovascular examinations are normal.

What's the call?

Brianna most likely has migraine-associated dizziness, which occurs in 7% to 9% of patients presenting with either complaint. Symptoms of dizziness peak in the fourth to fifth decade, often many years after the onset of migraine headaches. The characteristic migraine may never be temporally associated with the dizziness.

What are the triggers and treatments?

Triggers for dizziness are those which provoke migraines.

Treatment of the dizziness is aimed at prevention of migraines.

Symptoms:

- Abrupt/insidious onset
- Headache (may be absent)
- Nausea
- Photo/phonophobia
- Catamenial exacerbation
- Motion sickness

Treatment:

- Identify triggers
- Treat with migraine prophylactic agents

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Case #3: Ricky's Stress

Ricky, a 22-year-old foreign university student, presents with a two-week history of dizziness. While he has experienced the symptoms on two or three previous occasions, this time the severity has increased. Episodes are lasting longer and occur more frequently, now several times daily. He describes lightheadedness with slight nausea. The dizziness will typically occur in class or sitting at his computer. He is otherwise well. He is enrolled in a difficult university program and his stay in Canada has been jeopardized by poor marks and financial troubles.



Where do you go from here?

His examination is unremarkable, so you decide to try to reproduce his symptoms in your office. Hyperventilation for two minutes brings on an attack and he admits he has similar feelings of dizziness when confined in small spaces.

What's causing the dizziness?

Psychophysical dizziness can be associated with panic attacks or agoraphobia. Up to 60% of patients with panic attacks will have a component of dizziness. Up to 72% of dizzy

patients may have a psychogenic origin or a comorbid psychiatric disorder. Anxiety may prolong symptoms of true vestibular disorders. Hyperventilation can cause presyncopal symptoms by lowering blood carbon dioxide.

Symptoms:

- Abrupt onset
- Anxiety, panic, palpitations, diaphoresis, weakness, dyspnea, xerostomia
- Frequently associated with stress

Treatment:

- Treat underlying anxiety or depression with appropriate therapy
- Reassurance

Drawing the information out *When did it start?*

It is important to ascertain if the dizziness has been present since childhood or if it is a recent development.

How did it start?

Was there a precipitating event? If the patient suffered some sort of head injury, even a minor one, benign paroxysmal positional vertigo (BPPV) may be present. Patients frequently do not recognize the instantaneous imbalance provoked by BPPV as true vertigo. Cervical muscle spasm and pain may be provoking symptoms of dizziness consistent with a diagnosis of "cervical vertigo". The introduction of new medication, such as anti-inflammatories, may be the precipitating occurrence. The postural hypotensive effects of an antihypertensive may be interpreted as dizziness. Perhaps the preceding event was exposure to a vestibular toxin, such as furosemide or gentamicin. Toxins will typically cause symmetric vestibular loss manifested as imbalance, not vertigo.

Case #4: Agatha's Viewpoint

Agatha, 75, presents with a six week history of dizziness which began insidiously within one week of uncomplicated cataract surgery. She describes constant lightheadedness with slight environmental motion. She has never had similar symptoms in the past. She feels symptoms have been improving over the last two weeks. She has no other significant medical problems and is not taking any medication. The operated eye is seeing 20/20 and the other eye is seeing 20/200, with a noticeable cataract. Her examination is otherwise normal.



How does the followup alter your approach?

She returns with worse lightheadedness after a cataract removal on the second eye. Again, there are no physical abnormalities upon examination. Acuity in both eyes is 20/20. She is encouraged to remain active and symptoms eventually dissipate.

What's causing Agatha's symptoms?

Agatha's case demonstrates how dizziness can be caused by refractive changes, termed ocular dizziness. Changes in refractive requirements necessitate adaptation of the VOR in order to calibrate eye movements to head movements. Ocular dizziness occurs when refractive change, such as after cataract extraction and intraocular lense implantation, exceeds the individual's ability to adapt VOR. With aging, VOR adaptation slows and becomes less effective. In children, strabismus can cause ocular dizziness.

Treatment:

- Vestibular physiotherapy
- Exercise
- Treat ophthalmic problem

How long and frequent are the episodes?

If the symptoms are episodic, then the provocative factors are important to ascertain. Perhaps an alteration in diet, exercise regimen, or start of oral contraceptives has initiated migraines.

Take-home message



- The history is more important than a physical exam when assessing a dizzy patient. Patients may have no findings at the time of the examination, but the history can direct the physical examination and lead to the most appropriate diagnosis.
- Dizziness can be due to dysfunction of the heart, endocrine system, peripheral nerves, joints, muscles, or eyes.
- The majority of dizzy patients have more than one cause for their symptoms.
- Dizziness is frequently non-vertiginous. Patients should be treated with vestibular suppressants (e.g. meclizine or betahistine) only when clinically appropriate.

Watch for catamenial exacerbation in premenopausal or perimenopausal women. Typically migraine-associated symptoms will last hours, or even days, while BPPV-like symptoms or presyncope may be instantaneous. Constant dizziness implies a cause that does not change over the course of a day and may be consistent with “ocular” or “cervical” dizziness.

Is there a connection to the past?

Past medical history may reveal hypertension, myocardial infarction, or cardiac arrhythmia. Diabetes mellitus is frequently associated with multifactorial dizziness. Other causes of visual impairment are important, as are causes of peripheral neuropathy. Whether current or treated in the past, hypothyroidism may also contribute to dizziness. A family history may also show a hereditary basis for the patient's symptoms.

Case #5: Patrick's Many Facets

Patrick, 64, presents with dizziness. He has recently been hospitalized for a foot infection secondary to his Type II diabetes and was treated with gentamicin. His symptoms began while in the hospital when he tried to walk and found himself to be quite imbalanced. He denies lightheadedness or vertigo, but feels he will fall without support. He complains of some nausea, post-prandial bloating, and diarrhea. He is currently taking insulin, hydrochlorothiazide, metoprolol, and amitriptyline. His examination is remarkable for impaired vision due to diabetic retinopathy, peripheral neuropathy, and a postural drop in blood pressure. His VOR is hypometric for head thrusts to both the right and left, and he has significant retinal slip when viewing the optic nerves during head movement.



What's the diagnosis?

Patrick's symptoms are consistent with multisensory dizziness, which occurs when there are reduced inputs from more than one sensory system. Patrick has reduced vision, vestibular loss, peripheral and autonomic neuropathy, and is taking antihypertensive medications; all of those factors are contributing to his dizziness.

What causes this dizziness?

In order to obtain balance, accurate and co-ordinated inputs are required from at least two of the three sensory systems which control balance—the vestibular system, vision, and position sense. Balance is impossible when two of three systems, or portions of all three systems, are lost.

Symptoms:

- Insidious onset
- Constant
- Associated imbalance may be prominent

Treatment:

- Try to improve or maintain vision
- Avoid walking on uneven ground or in low light circumstances
- Treat underlying medical problems and eliminate or reduce offending medications
- Keep active

Physical examination

Once the diagnostic possibilities have been determined, a physical examination should be used to ascertain the most likely cause or causes of the patient's symptoms.

An examination of the fundus may reveal a lot. Determining the health of the retina and optic discs is important, as it can lead to a diagnosis of hypertension or diabetes. By watching the optic disc, you can observe small eye movements consistent

with primary position nystagmus. For example, the optic disc may move slowly to the right followed by a leftward fast phase. As the front of the eye

moves in the opposite direction to the back of the eye, these small movements represent primary position right beating nystagmus.

By viewing the optic nerve, while generating small head movements, the accuracy of the vestibulo-ocular reflex (VOR) can be assessed. If the VOR is precisely calibrated, the amplitude and velocity of compensatory eye movements should match the head movements with the optic nerve remaining stationary. If the VOR is imbalanced, retinal slip will occur and will be seen as small to-and-fro movements of the optic nerve induced by head motion.

The VOR may also be tested by observing

Case #6: Dave's Imbalance

Dave, 43, complains of dizziness, which began four years prior and has progressively worsened. He denies vertigo or lightheadedness, but observes environmental motion he describes as "bouncing". He cannot balance and is afraid of falling. His symptoms are present all the time, but are worse if he is fatigued or walking on an uneven surface, especially in low-light conditions. He has frequent episodes of vertical diplopia and some dysarthria.

His examination is significant for primary position downbeat nystagmus, gaze evoked horizontal and downbeat nystagmus, and vertical diplopia in all positions of gaze. He has mild dysarthria, reasonable rapid alternating movements, widebased gait, and is unable to tandem walk.



What's causing Dave's dizziness?

Dave has imbalance which is the inability to maintain equilibrium and could be due to disease of the cerebellum, basal ganglia, or frontal lobes. A magnetic resonance imaging scan is essential to establish the diagnosis. The presence of downbeat nystagmus localizes the lesion to the cranio-cervical junction.

Understand the gait

Gait deteriorates with aging and senescent gait must be distinguished from the shuffling, steppage gait of Parkinson's disease and the gait apraxia of bilateral frontal lobe dysfunction (caused by subcortical strokes or multiple sclerosis). Cerebellum ataxia is a broad-based gait typically associated with other cerebellar signs. Gait disorders can also accompany arthritis of the lower back, hips, and knees.

Symptoms:

- Insidious onset
- Oscillopsia
- Ataxia
- Arthritis
- Family history
- Constant
- Diplopia
- Dysarthria
- Intention tremor

Treatment

- Treat the specific cause

catch-up eye movements when the patient is given a quick head thrust. Further examination of the ocular motor system may reveal gaze evoked nystagmus or saccadic smooth pursuit.

Absent deep-tendon reflexes will indicate peripheral neuropathy. The integrity of the cerebel

lar and vestibulospinal systems can be assessed by observing gait, tandem gait, and Romberg's testing.

A cardiovascular examination is important for the detection of cardiac murmurs or arrhythmias. Significant varicosities, in the legs or pedal edema, may indicate an incompetent venous return, suggesting postural hypotension. A precordial examination is essential with sitting and standing blood pressures. [CME](#)

Case #7: Donna's Cervical Vertigo

Donna, 55, presents with dizziness. Her dizziness is described as constant lightheadedness without vertigo. It is worse with head motion, when she arises in the morning, at work, or during exercise. She has chronic neck and head pains, which are described as aching and non-throbbing. She takes acetaminophen two or three times daily.

Her symptoms began four years ago after a minor motor vehicle accident. She suffered neck pain and wore a neck brace "faithfully" for a month. She attended physiotherapy for six weeks before deciding that it caused more pain and dizziness.

She has a normal neurologic examination. There is significant tenderness throughout her cervical muscles and bilateral temporomandibular joint crepitus, with pain to palpation. Neck flexion is weak and lateral bending is restricted bilaterally.

How would you diagnose Donna?

Donna displays symptoms of cervical vertigo.

What's the cause?

Theoretically, cervical vertigo is caused by proprioceptive-vestibular mismatch. Symptoms occur when proprioceptive input from muscle spindles in cervical muscles is altered by pain and does not agree with information coming from the inner ears.

What's the treatment?

Treatment consists of muscle relaxants and physiotherapy directed towards the painful muscles, with elimination of any ongoing precipitating factors.

Treatment

- Aerobic conditioning
- Neck exercises with increased range of head motion
- Mouth guard
- Muscle relaxants
- Amitriptyline



References

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Further references available—contact The Canadian Journal of CME at cme@sta.ca