Vertigo:

A Dizzying Diagnosis

Beth Lange, MB, ChB, MD, FRCSC

Vertigo is an illusion of movement when no movement exists. It implies an asymmetry of the right and left vestibular system, but is not a diagnosis. It may be caused by central or peripheral dysfunction.

Symptoms of vertigo are usually aggravated by head or body movement, which does not necessarily aid in the differential diagnosis.

Inner ear infection, labyrinthitis and positional dizziness are common diagnoses often based on symptoms of dizziness and the absence of central nervous symptoms or signs.

The distinguishing features between them will be discussed as appropriate treatment depends on accurate diagnosis.

Vestibular neuritis

Vestibular neuritis causes severe vertigo, imbalance and vomiting, usually occurring weeks to a month or two after a suspected viral infection. The patient is dizzy at rest. Nystagmus should be obvious and symptoms are aggravated by any movement, particularly large or fast movement. Nystagmus direction does not change with position change.

If there is a clear history of preceding viral illness, intravenous methylprednisolone, dexamethasone (6 mg to 10 mg intravenously) may improve the situation rapidly and may prevent permanent damage to the nerve,[1-3] similar to treatment for Bell's palsy.

The theory of using dexamethasone is that the inflammatory swelling of the vestibular nerve is lessened; therefore, less compression damage is caused to it as it is enclosed in the internal auditory meatus. Important in the history is the absence of hearing loss, which is more common with labyrinthitis.

Fred's Dizziness

- Fred, 41, presents with severe vertigo, imbalance and vomiting. Several weeks prior, he had mild, "flu-like" symptoms (mainly malaise and muscle aches). His symptoms are aggravated by head movement.
- He is admitted to the hospital for rehydration, with the admitting diagnosis of viral labyrinthitis.
- He improves on fluids and antiemetics.
- When examining Fred for discharge, a second physician notes Fred's symptoms are aggravated when he sits up and, thus, puts benign positional vertigo (BPV) as the discharge diagnosis.
- While researching his symptoms on the Internet, Fred finds BPV can occur after head trauma. He recalls banging his head at work some weeks before his vertigo began.

Table 1

How to increase chances of seeing nystagmus

1. In the very ill patient:

Perform during routine ophthalmoscopy

a) Examine the fundus of one eye with the patient's glasses on. After about one minute, the retina is "bleached" in this eye (visual fixation is abolished).

b) Find a blood vessel in the opposite eye, which may beat with the slow and fast phase of nystagmus. One caveat: blinking may give a false impression of downbeat nystagmus and some patients may not be able to co-operate by maintaining a steady gaze.

2. In the acute or chronic patient:

The eyes can be magnified by the patient wearing high diopter reading glasses. Nystagmus is more easily seen. These glasses are readily available in pharmacies and are inexpensive for the physician to purchase.

Did you know?...

The vestibular system senses movement of oneself. The vestibular end organs, the semicircular canals and the otolithic organs are motion sensors.

Information about sensed movement is sent to the vestibular nuclei, which assesses and "weighs" information received from the eyes and proprioceptive system, as well as the inner ears, and sends appropriate responses to the oculomotor system to maintain visual stability and to the muscles of locomotion to maintain balance.

Dr. Lange is an Assistant Clinical Professor, University of Calgary, Calgary, Alberta.

Labyrinthitis
(Inner ear infection)

A viral infection may precede labyrinthitis, but usually there are more otologic symptoms, such as aural fullness and hearing loss. The patient's symptoms are aggravated by any movement as with vestibular neuritis, but, once again, the nystagmus direction remains the same regardless of the patient's position.

The advantage of dexamethasone is less well-established in this scenario, but short-term sublingual lorazepam or dimenhydrinate given parenterally or rectally may give the patient rapid relief. Oral treatment is not the best choice in nausea and vomiting.

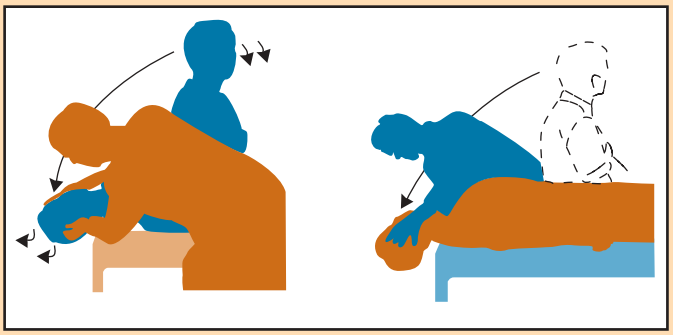

Figure 1. Dix-Hallpike manoeuvre.

1. While sitting upright, the patient's head is turned to the right.
2. The patient is reclined with the head supported, but extended. The extension can be accomplished by either having a pillow under the shoulder blades or the head may be held off the end of the bed.
3. Watch for nystagmus. The classic nystagmus is rotary and upbeat toward the undermost ear.
4. Wait until it stops. (Transient)
5. Sit the patient up. The nystagmus should change direction on sitting up. (Reversible)
   Repetition of the manoeuvre will be associated with less nystagmus and fewer symptoms. (Fatigueable)
6. Repeat on the left side.

Benign paroxysmal positional vertigo

In this condition there are only some movements that cause symptoms. In most cases, the patients are quite functional and asymptomatic, unless they assume the provocative position. The symptoms occur within seconds

of lying down (*i.e.*, when the movement has stopped), not during the movement of lying down. There may also be symptoms after assuming the upright position, rolling to one side or with hyperextension of the neck.

The diagnosis is made by observing the nystagmus when the patient assumes the Dix-Hallpike position (the head-hanging position) (Figure 1). It will be rotary and upbeat when the affected ear is down. The nystagmus will fatigue within 30 seconds. Most importantly, when the patient sits up, the nystagmus will change direction. Repeated lying down exercises will improve the patient's symptoms and lessen the nystagmus.

While symptomatic treatment for nausea may be necessary, the mainstay of treatment is repetition of movement, which involves lying down and sitting up with the head turned to the side (Figure 2). Symptomatic treatment for nausea may be necessary. This can be a "hard sell" to the patient who, quite reasonably, would prefer avoidance, but the analogy of the stiff shoulder that worsens with inactivity, usually makes sense to them.

If there is no improvement within one to two months, remember posterior fossa tumours rarely present in this fashion. Therefore, appropriate imaging studies or specialist referral should be done. If the classic rotary and upbeat nystagmus is not seen, refer the patient.

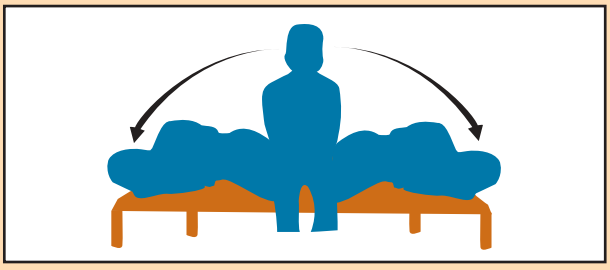

Figure 2. Vestibular exercises for positional vertigo.

Sitting on a bed or couch:

1. Lie on side; turn head up to look at ceiling.
2. Wait for dizziness to pass.
3. Sit up and lie down on opposite side.
4. Wait for dizziness to pass.
5. Repeat exercises five times daily and increase weekly. An anti-nauseant 30 minutes before starting the exercises may be needed initially.

Frequently asked questions...

1. What should I do about the patient who, although never really sick, always complains of being dizzy?

There may not be an answer to this one in all cases. Give consideration to sleep disorder, andropause, menopause or anxiety.

2. How can I be sure the initial episode is not Menière's syndrome, especially if there are some otologic symptoms?

Menière's syndrome is rare and requires repeated episodes with accompanying tinnitus, aural fullness and low frequency of hearing loss for a diagnosis to be certain. First episodes of severe vertigo have a large differential diagnosis.

3. When should a patient have their driver's license revoked?

Instant disability is unusual and usually patients have some warning. If your patient has symptoms with fast head movement, they can not shoulder check safely. If they have dizziness caused by visual surround movement, they should not drive in poor light or bad weather conditions.

Did you know?...

The primary physician has the most difficult task in the diagnosis of the dizzy patient. The physician must rule out potentially life-threatening cardiac and neurologic crises.

Often during the course of ruling out serious, life-threatning illness, the patient may be given medication that masks the nystagmus, which is so crucial for diagnosis (Table 1).

As peripheral vestibular symptoms are similar, the diagnosis of labyrinthitis, inner ear infection, positional vertigo and "virus in the ear" are often used interchangeably.

Most peripheral dysfunction is benign and self-limiting, but when patients are not better within the one to two weeks suggested by the primary physicians, they are referred for specialist assessment.

Table 2

Vestibular exercises for movement-induced dizziness

Sitting:

- Eye movements:
  - Up and down
  - Side to side
  - Oblique (right down to left up; left down to right up)

  **All performed twice*
  - Circular (following an object held in the hand and keeping in focus)

- Head movements:
  - Up and down (nodding)
  - Side to side ("no")
  - Tilting (ear on shoulder)
  - Oblique (looking behind shoulder)

  **All performed twice*
  - Shoulder shrugging and circling (to prevent stiffness and discomfort if patient is holding his/her head or neck stiffly)

Standing:

- Changing from sitting to standing first with eyes open and then with eyes closed
- Changing from sitting to standing and turning in between
- Throwing a small ball from hand to hand above eye level (follow with eyes)
- Throwing a small ball from hand to hand under the knee (below eye level and follow with eyes)

Moving:

- Standing and moving body in circular direction
- Shift weight from one leg to the other. **Use all balance exercises with caution in the elderly with peripheral neuropathy.**
- Side step right and left
- Walk moving head from side to side

References

1. Steroid is effective for vestibular neuritis, valacyclovir is not: J Fam Pract. 2004; 53(11):864-7.
2. Strupp M, Zingler VC, Arbusow V, et al: Methylprednisolone, valacyclovir, or the combination for vestibular neuritis. N Engl J Med. 2004; 351(4):354-61.
3. Kitahara T, Kondoh K, Morihana T, et al: Steroid effects on vestibular compensation in human. Neurol Res. 2003; 25(3):287-91.

Recommended reading:

1. Goebel, JA (Ed.): Practical Management of the Dizzy Patient. Philadelphia: Lippincott Williams & Wilkins, 2001.

Migraine vestibulopathy

Increasingly, in recent medical literature, dizziness, imbalance and vertigo are being recognized as possible migraine aura, with or without the accompanying headache. Any of the above symptom complexes (including positional symptoms) have been described.

Migraine vestibulopathy remains a diagnosis of exclusion, but if patients do not respond well to the above suggestions, negative imaging and either a history of migraine or a history of accompanying symptoms that may be sensory (*i.e.*, sensitivity to light and sound, aggravation by weather change, *etc.*), a trial of migraine prophylaxis is not unreasonable.

Often the symptoms that give clues are not as distressing as the vertigo, so the patient fails to mention them. Prophylaxis is preferable to acute medication that targets the headache.

What about treatment?

For fast control of vomiting, sublingual lorazepam is useful if rectal or parenteral medication is not feasible. It cannot be used long-term, owing to the addictive potential. Meclizine may be a better choice, or long-acting dimenhydrinate.

Once the vomiting is settled, the patient should be encouraged to increase their exercise tolerance. Graduated home vestibular exercises for movement-induced dizziness will help (Table 2).

There are many described manoeuvers for benign paroxysmal positional vertigo that may be difficult to follow, particularly if the physician is unsure about the diagnosis. In brief, asking the patient to repeat the movement that causes symptoms may give just as good results long-term, if vestibular physiotherapy support is not possible.

There are numerous studies to show that the majority of motivated patients can do their own home program, but for those who are very sick, fearful or in danger of falling, a vestibular therapist can be of great help.

cme