“Doctor I’m Dizzy”  
An Approach to Evaluation

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Overview
- What does dizzy mean?
- Epidemiology of dizziness
- Screening for dangerous causes
- Treatment of acute dizziness
- Chronic Dizziness: anything to be done?
- Future directions

What does dizzy mean
- Vertigo
- Near-syncope
- Ataxia

The Acute Vestibular Syndrome
- Sudden onset of
  - Severe vertigo
  - Nausea and vomiting
  - Spontaneous nystagmus
  - Postural instability
- Potential pitfalls
  - In a healthy person, it is usually attributed to a viral vestibular neuritis

Infarction and vertigo
- Infarction and hemorrhage of the inferior cerebellum, however, may simulate vestibular neuritis
- Up to 25% of patients with risk factors for stroke who present with acute vestibular syndrome to an emergency medical setting have an infarction of the inferior cerebellum

Cerebellar Infarct
The worst case scenario

- Important to recognize
  - Can produce cerebellar swelling
    - Brain-stem compression
    - Death unless
  - May need neurosurgical intervention

Central vs. peripheral vertigo

- Important to recognize an ischemic acute vestibular syndrome and identify its cause
  - Decrease the probability of recurrent stroke
- Differentiation of a peripheral vestibular lesion from stroke
  - Clinical clues
  - Directed neuroimaging

Cerebellar Stroke

Malignant Cerebellar Infarction

Cerebellar Artery Territories

Peripheral Vertigo

The bony labyrinth

Vestibular sensory organs

- Produce action potentials at a tonic rate to the brain stem
- Rapid unilateral disorder causes severe vertigo
- Bilateral ototoxicity does not produce vertigo
- Slowly evolving unilateral process; no vertigo

Vertigo

- An illusion of movement
- Cardinal symptom of vestibular dysfunction
- Typically rotational
  - Rotational vertigo may indicate disease of the semicircular canals/their central connections
- Illusion of tilting or swaying
  - May occur in disorders affecting the otolithic organs or their projections

- Vertigo worsened during standing/walking
  - Patients lie still and avoid movement
- Acute vertigo is accompanied by
  - Nausea/vomiting
  - Autonomic distress
- Different causes of acute vertigo can be distinguished by the time course, duration, and recurrence of the illusion of movement
Time Course of Vertigo

- Lasting a day or longer
  - Vestibular neuritis
  - Stroke
- Lasting hours or minutes
  - Meniere’s syndrome
  - Transient ischemic attack
  - Migraine headaches
  - Partial seizures (rare)
- Lasting Seconds
  - BPPV

Vestibular Neuritis or Stroke?

- Type of nystagmus,
- Severity of postural instability
- Presence or absence of additional neurologic signs
- Presence of hearing loss

Acute unilateral peripheral

- Spontaneous nystagmus
- Continues in the same direction when the direction of gaze changes
- Typically horizontal
  - May have a torsional component
- Nystagmus increases with gaze in the direction of the fast phase
  - Decreases in intensity when the gaze is away from the fast phase

Peripheral Nystagmus

- May cause spontaneous nystagmus
  - Changes its direction with change in direction of gaze (gaze-evoked nystagmus)
- Nystagmus may be present only when gazing in one direction
  - Appearing similar to a peripheral nystagmus
- Almost always due to central
  - Purely vertical nystagmus and purely torsional nystagmus

Acute unilateral central

Central Nystagmus
Examination

• Tendency to fall to one direction
• Romberg testing patients told to lean or fall in the natural direction
  – Peripheral vestibular disorder
    • Falling to the side opposite direction of nystagmus and toward the side of the lesion
  – With the Romberg test the direction of tilting or falling may be variable

Pitfalls

• Occlusion of the anterior inferior cerebellar artery (AICA) can produce both vertigo and hearing loss
  – Mimics neurolabyrinthitis
  – Concomitant brain-stem or cerebellar signs are almost always present.
• Absence of additional neurologic findings, does not exclude the stroke limited to the inferior cerebellum
  – Dysemriam may be minimal or absent

Evaluation

• History and examination consistent with central disorder
  – Immediate brain imaging is mandatory
• Examination findings that are not typical of a peripheral vestibular disorder
  – Brain imaging is recommended
• Sudden onset of symptoms with prominent risk factors for stroke
  – Brain imaging is recommended

Different courses

• Healthy young people who present with acute vertigo, peripheral vestibular nystagmus, and postural instability
  – Usually have a benign, self-limited process.
• Persons with risk factors for stroke who do not have the typical findings of a peripheral vestibular disorder
  – Evaluated promptly for a potentially serious cerebellar stroke

Neuroimaging in Stroke
Benign Paroxysmal Positional Vertigo

- Most common type of vertigo
- Dizziness or vertigo of sudden onset
  - Provoked by certain changes in head position
    - Rolling over in bed
    - Bending over
    - Looking upward
- Free-floating particles in the posterior semicircular canal
- Bedside treatment can offer relief

Diagnosis

- Lasts seconds
- Nystagmus
  - Positionally provoked
  - Contains both torsional and vertical components

Pathophysiology

- The movement of the debris causes alterations in endolymphatic pressure and thus cupular deflection
- Clinical manifestations explained by transitory movement of debris within the posterior semicircular canal
- Pathophysiology consistent with the epidemiologic features
  - Head trauma is a frequent antecedent

Diagnosing BPPV

- Dix–Hallpike test
  - Mixed torsional and vertical nystagmus
  - Beating toward the dependent ear and the vertical nystagmus beating toward the forehead
  - Begins after a 1-to-2-second latency
  - Lasts for 10 to 20 seconds
  - Associated with sensation of rotational vertigo
Additional Testing?

- Classic findings & favorable response to bedside treatment: No
- Abnormal findings on neurologic exam
- Atypical positional nystagmus
- No response to bedside treatment
- Dizziness or dysequilibrium cannot be attributed entirely to BPPV

Treatment

- Bedside maneuver (Epley)
  - Contraindications
    - Severe neck disease
    - High-grade carotid stenosis
    - Unstable heart disease
  - In a randomized, controlled trial
    - Success rate of 89% after a single treatment
    - 23% in a sham (untreated) control group
- Heels-over-head rotational chair

Vestibular Supressants

- Do not routinely prescribe
- Medications do not reduce the frequency of attacks of recurrent vertigo
  - May reduce the intensity of symptoms
- Produce unwanted side effects
  - Sleepiness, lethargy, and worsening of balance
- Prolonged use of vestibular suppressants
  - May delay the adaptation of the CNS

Distinguishing Episodic Vertigo

- Benign paroxysmal positional vertigo
  - Provoked by Δ in position & lasts for seconds
- Meniere’s disease
  - Vertigo ± hearing loss and tinnitus
- Migraine associated vertigo
  - Usually precedes/accompanied by headache
- Vertigo in vertebrobasilar insufficiency
  - Brain-stem symptoms: diplopia, dysarthria
- Vestibular neuronitis
  - Single episode may last as one or two days