Dizziness, Vertigo, and Syncope: Assessment and Treatment

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Disclosure
• No real or potential conflict of interest to disclose.
• No off-label, experimental or investigational use of drugs or devices will be presented.

Objectives
• At the conclusion of this presentation the participant will:
  – Differentiate among causes of syncope, near syncope, vertigo and ataxia including adverse drug effects.
  – Analyze differences between central and peripheral vertigo.
  – Evaluate pharmacologic interventions for the disorders presented.
Assessment of Dizziness

• Ataxia
  – Inability to maintain balance
• Near-syncope
  – A sense of “sinking” without actual loss of consciousness

Assessment of Dizziness

• Vertigo
  – Sense of the rotational movement of self or surroundings
• Syncope
  – Actual loss of consciousness

Ataxia

• Balance and coordination are first affected.
• Other symptoms occur later:
  – Loss of fine motor coordination
  – Slurred speech
  – Difficulty swallowing
• Both hereditary and spontaneous forms exist.
Hereditary Forms

Autosomal Dominant
- Spinocerebellar ataxia includes
  - Cognitive defects
  - Dementia
  - Neuropathy
  - Extrapyramidal features
- Adult onset forms exist

Autosomal Recessive
- Friedreich's ataxia includes
  - Cerebellar sx.
  - Corticospinal sx.
  - Sensory loss
  - Wheelchair dependence
  - Average death age 38 years

Sporadic Ataxia

- Diagnosis of exclusion
- SCA is ruled out.
- Adult onset
- No family history
- Symptoms less severe than SCA

Transient Forms

- Short-lived as name implies
- Result from insult to the cerebellum
- Alcohol or drug intoxication are leading differentials.
- Infection: Viral, meningitis, Creutzfeldt-Jacob
- Metabolic imbalance
- Abnormalities in PTH, Vit E malabsorption
Identifying Ataxia

- When the chief complaint is “dizziness” the evaluation proceeds to differentiate among actual symptom type.
- When the primary problem is ataxia, the diagnostic evaluation should proceed to rule out hereditary vs sporadic vs transient causes.

Pharmacologic Implications

- Drugs that can produce ataxia
  - Antiepileptics
  - Dextromethorphan
  - Fibric acid derivatives
  - Metformin
  - Levodopa
  - Methotrexate
  - Thiazide diuretics

Near-syncope

- Patients may be describing near-syncope when the chief complaint is “dizziness.”
- Near-syncope is generally the result of transient, decreased blood flow to the brain.
- Patients describe a general sense of “sinking” of “almost fainting” or “fainting.”
Near-syncope (continued)

- Characteristic (but not prerequisite) in the description of symptoms is that it occurred when the patient was upright and resolved when they went supine/prone.

Near-syncope (continued)

- Causes of near-syncope will be explored more fully in the discussion of syncope.
  - Cardiogenic
  - Neurocardiogenic
  - Neurologic
  - Psychiatric

Vertigo

- Described by the patient as the sense of the patient or the room “spinning.”
- Often accompanied by other symptoms.
- Occurs in any position.
- Is the cardinal symptoms of vestibular dz
- Virtually always exacerbated by head movement and never continuous.
Diagnostic Evaluation of Vertigo

• Vertigo is almost always evaluated effectively by the history.
• Rule out systemic/metabolic causes.
  – Medications
  – Psychogenic
  – Infection
  – Hypoxia

Drugs that Cause Vertigo

• Similar to those causing ataxia
  – AEDs
  – Sedative-hypnotics
  – Narcotic analgesics
  – Antibiotics
  – Salicylates
  – Miscellaneous

Central or Peripheral

• After ruling out metabolic causes, need to determine whether vertigo is central or peripheral
• Consider the statistics
  – 50% of vertigo is benign paroxysmal positional vertigo (BPPV).
  – 25% of vertigo is vestibular neuronitis.
  – 10% of vertigo is Meniere’s disease.
Central Vertigo

- Cerebellar disease accounts for most cases of central vertigo.
- Brain stem ischemia
- Multiple sclerosis

Central Vertigo

- Associated symptoms increase likelihood of central dz.
  - Hiccups in coordination
  - Visual or sensory loss
  - Diplopia
- Neoplastic disease accounts for only 1%.
  - Onset is insidious.

Central Vertigo

- Vascular disease accounts for remainder of central vertigo.
  - Other symptoms of vascular disease are usually present.
  - Onset of vertigo more acute and lasts for minutes.
  - Other neurologic symptoms may be present.
Central Vertigo Associated Findings

- Diplopia
- Autonomic symptoms
- Nausea
- Dysarthria
- Dysphagia
- Focal weakness

Central Vertigo Associated Findings

- Unable to ambulate during acute episodes
- Dysdiadochokinesis (DDK or ataxia in cerebellar disease)
- Sensory/motor sx in CNS disease

Peripheral Vertigo

- A variety of conditions that are external to the brain stem and cerebellum are considered peripheral vertigo.
Peripheral Vertigo

• Causes
  – Meniere’s disease
  – Recurrent vestibulopathy
  – Labyrinthitis
  – Benign paroxysmal positional vertigo (BPPV)
  – Traumatic vertigo
  – Perilymphatic vertigo

Peripheral Vertigo

• Associated symptoms contribute to diagnosis.
  – Hearing loss
  – Pain in the ear
  – Tinnitus

Characteristics of Peripheral Vertigo

• Sudden onset and vivid memory of vertigo usually a product of inner ear disease
• Onset and time course help distinguish among peripheral causes
• Associated or exacerbated with head or body movement or position changes
Meniere’s Syndrome

- Clinical diagnosis of vertigo, hearing loss, tinnitus
- Cause is unknown.
- Distention of the endolymphatic compartment of the inner ear
- It is chronic.
- Sensorineural hearing loss

Recurrent Vestibulopathy

- Meniere’s syndrome without the auditory symptoms
- Most patients will go on to develop the auditory symptoms.
- Increased incidence in migraine sufferers

Labyrinthitis

- Transient vertigo
- Acute and short-lived
  - Typically a matter of days
- Often associated with bacterial or viral infection
- Associated tinnitus and hearing loss
- Rapid head movement will provoke vertigo for weeks.
Less Common Causes of Peripheral Vertigo

• Positional vertigo
  – Vertebrobasilar insufficiency
  – Triggered by position change: Sx occur 10–60 seconds later
• Traumatic vertigo: Follows fx
• Periphymphatic vertigo
  – Linked to head trauma, barotrauma, Valsalva

Remember…

• Vertigo is never continuous.
• Vertigo is always exacerbated by head movement.
• If both of these are not present, the patient is not having vertigo.

Physical Examination

• Romberg test
• Evaluate gait
• Nystagmus
• Vision/hearing
• Provoking maneuvers
  – Valsalva maneuver
  – Nylen-Barany maneuver
Nystagmus Assessment

• Description of nystagmus should include
  – Provocative factors
  – Direction
  – Latency
  – Fatigue
  – Suppression by visual fixation
  – Accompanying dizziness

Nystagmus

• Peripheral vertigo
  – Usually rotary
  – Most evident by removing visual fixation
  – Can fatigue if elicited by head movement
  – Does not change direction with change of gaze
  – Diminishes with fixation

Nystagmus

• Central vertigo
  – Purely horizontal or vertical
  – Not suppressed by visual fixation
  – Can change direction with gaze
Head Tilt Test

- Nystagmus and vertigo occur when diseased side turned downward.
- Peripheral nystagmus fatigues with repeated maneuvers.
- Central nystagmus does not change with repeated maneuvers.

Medical Management of Central Vertigo

- Histamine receptor antagonists
  - Decreases excitability of inner ear labyrinth and blocks conduction in inner ear vestibular-cerebellar pathways
- Anticholinergic agents
  - Blocks action of acetylcholine at parasympathetic sites in CNS
  - Antagonizes histamine and serotonin action
Medical Management of Central Vertigo

- Benzodiazepines
  - Potentiate effects of (GABA) and facilitates inhibitory GABA neurotransmission and other inhibitory transmitters
- Phenothiazines
  - Blocks postsynaptic mesolimbic dopaminergic receptors in brain and reduces stimuli to brainstem reticular system

Medical Management of Peripheral Vertigo

- Medications not always recommended; depends upon the type
- Acute vertigo: Bedrest
- Chronic vertigo: Activity

Medical Management of Peripheral Vertigo

- Vestibular neuronitis
  - Vertigo without auditory sx, lasts several days to one week; frequently followed by several weeks of BPPV
  - 1/3 of patients develop chronic sx
  - Likely of viral etiology
Medical Management of Peripheral Vertigo

• Vestibular neuronitis (cont.)
  – Brief course of antiemetics and vestibular suppressant in acute phase
  – Corticosteroids can improve long-term outcomes.

Medical Management of Peripheral Vertigo

• BPPV
  – May be symptomatic of another condition or idiopathic
  – Brief vertigo with position change
  – Treatment involves dispersing otoliths.
  – Treated with Epley’s maneuver

Medical Management of Peripheral Vertigo

• The traditional cocktail for symptom management
  – Benzodiazepine
  – Antiemetic
  – Antihistamine
Management of Peripheral Vertigo

• Meniere’s disease
  – Low salt diet and diuretics helpful for 80% of patients.
    • Thiazides are the most common type used.
    • No strong evidence-based support for efficacy of diuretic therapy

Management of Peripheral Vertigo

• Meniere’s disease (cont.)
  – Alcohol, caffeine, nicotine avoidance
  – Steroids for severe episodes
  – Injection of gent/bicarb only in ear with no serviceable hearing
  – Surgical therapies very controversial
Syncope

• Multiple causes of syncope
• Generally divided among four categories
  – Neurological/neurogenic
  – Cardiogenic
  – Postural
  – Others

Neurogenic Syncope

• Need to rule out seizure
  – Post episode disorientation
  – Bowel/bladder incontinence
  – Tongue biting
• Small cerebral bleeds/infarcts
• Assess for focal neurological deficits
• Not affected by position

Cardiogenic Syncope

• Generally characterized by an absence of premonitory symptoms
• Can include any cardiogenic cause of decreased cerebral blood flow
  – Dysrhythmia
  – Valvular disease
  – Atrioventricular block
Postural Causes

• Hypotension
  – Consider new vasoactive meds
• Baroreceptor abnormalities
  – Common in the elderly
• Dehydration
• Neurocardiogenic syncope (vasovagal)
  – Emotional factors
  – Physiologic factors

Syncope Risk Factors

• Cardiovascular disease
• Diabetes
• Offending drug therapy
• Age
• Neurologic disease

Signs and Symptoms

• Loss of consciousness is the significant one.
• Presence of a prodrome suggests neurocardiogenic.
• Signs and symptoms of predisposing disease may be present.
Diagnostic Studies

• Dictated by the history of the event
• Positive tilt test suggests autonomic dysfunction
• More invasive procedures as indicated when cause remains elusive

Management of Syncope

• When organic cause identified, treat as appropriate
• Therapies for recurrent neurocardiogenic syncope
  – Non-cardioselective beta blockade
  – Fludrocortisone (Florinef®)
  – SSRIs
  – Disopyramide phosphate (Norpace®)
• Adjust medications that may be offending.

References

References
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