Evaluation of Dizziness in the Elderly

Kale Knudson, MD
Billings Clinic IMR Faculty
“A mind that is stretched by a new experience can never go back to its old dimensions.” – Oliver Wendell Holmes
• 3 different family physicians, 107 physician visits, 8 neurology/3 ENT/2 Cards/1 Endocrine/PMR/allergist consults, negative studies

• No specific diagnosis

• IMPACT (interprofessional model of practice for ageing and complex treatment) – Sunnybrook
  – Avoid sudden movements, call if things worsen
The 17-minute managed-care visit will rarely suffice for evaluating the elderly patient with dizziness...it requires, and deserves, careful attention to sort out the underlying diagnoses and most often to treat successfully.

We need an evidence-based, practical approach to dizziness in the elderly...
Objectives

• Discuss the clinical importance of dizziness in the elderly

• Review approaches to evaluating dizziness in the elderly

• Understand treatment and management of geriatric dizziness
Why is dizziness important?
Population-based cohort study of patients 65 and older via telephone interview in Germany

Dizziness is significantly associated with disability (OR 1.7; CI 1.4-2.0) and among the strongest contributor to burden of disability with adjustments for age, sex, and chronic conditions
• Cross-sectional analysis NHIS

• Dizziness is an independent predictor of mortality (OR 2.2, CI 1.8-2.8) in preceding 12 months adjusted for age/gender, OR 1.7 adjusted for all covariates

• Similar rate of mortality to the four leading cause of death in adults
Why does it matter?

- It negatively affects our patients
- It is common
- It is burdensome to our health system
In general, what makes diagnosing and managing dizziness so challenging?
The Challenge of Dizziness

• One of the most challenging symptoms in medicine
  – Difficult to define
  – Challenge to diagnose
  – Troublesome to treat

• Most common nonspecific symptom

• Life threatening causes are rare but if present has serious functional impairment
What pathophysiologic mechanisms contribute to dizziness in the elderly?
Dizziness - Basics

- “Vertigo” and “dizziness” describe a whole spectrum of perceptions/symptoms
- Postural stability involves integration of visual, proprioceptive, somatosensory and vestibular signals
- Any discrepancy of the senses, slow or inaccurate central integration, or abnormal motor function may lead to mismatch in input causing dizziness/imbalance
Dizziness - Basics

- Dizziness is NOT an effect of normal aging
  - Aging increases susceptibility to dizziness and slower recovery
- With age:
  - Reduction in sensory receptors in semicircular canals/saccule/utricle/retina
  - Decline in vision (older individuals are more reliant on vision for postural control) and visual-vestibular reflexes
  - Decrease in limb muscle fibers, muscle control
Objectives

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What are causes of dizziness in the elderly?
Causes

• Classic “lumping”

• Geriatric Syndrome

• Vestibular Syndrome
Dizziness – “Lumping”

- Vertigo
- Presyncope
- Disequilibrium
- Nonspecific
Vertigo

• Illusion (false sense) of personal or environmental movement

• Associated with nausea, worse with head movement

• Described as swaying, tilting, associated with abrupt movement

“Frankly it’s one of the worst cases of vertigo I’ve ever seen.”
Vertigo -- Differential

• Peripheral
  – BPPV
  – Vestibular neuronitis/labyrinthitis
  – Meniere disease
  – Perilymphatic fistula, vestibular schwannoma, aminoglycoside toxicity, migraines, herpes zoster

• Central
  – Stroke, brain tumors, cerebellar atrophy, seizure disorders, multiple sclerosis, Wernicke's, brainstem encephalitis, migraines
  – Vertebrobasilar stroke usually presents with dysarthria, dysphagia, diplopia, weakness, numbness
  – **Isolated dizziness is a presenting symptom in 10-20% of patients with vertebrobasilar ischemia**
Dizziness – “Lumping”

- Vertigo
- Presyncope
- Disequilibrium
- Nonspecific
Presyncope

- Near LOC / light-headedness without loss of postural tone / “Impending faint”
- Neurally-mediated
  - Occurs with standing with nausea, LH, warmth
  - May follow cough, urination, defecation, pain, laughing
- Orthostatic
  - Primary, diabetes, amyloidosis, spinal cord injury, Parkinson’s, hypovolemia, medications, age-associated
- Cardiac
  - Abrupt, no prodrome, may have palpitations
- Cerebrovascular
  - Rare with anterior circulation, may see vertigo/dizziness with posterior circulation
Dizziness – “Lumping”

- Vertigo
- Presyncope
- Disequilibrium
- Nonspecific
Disequilibrium

- Unsteadiness, sense of imbalance with standing or walking (relieved with sitting)
- Elderly primarily at risk
- Causes:
  - Impaired visual/auditory acuity
  - Impaired proprioception
  - Motor weakness
  - Joint pain
  - Psychiatric disease
  - Orthostasis
  - Neuropathic/cerebellar disease
  - Medications
Dizziness – “Lumping”

- Vertigo
- Presyncope
- Disequilibrium
- Nonspecific
Nonspecific / Chronic Subjective Dizziness

- Lightheadedness, floating, swimming, heavy-headedness, feeling “spaced-out”

- Dizziness/disequilibrium present for most days over a period of at least 3 months that cannot be explained, consider Chronic Subjective Dizziness (CSD)
  - Usually more severe with standing or walking, motion, high stimulation, indistinct visual cues
  - Accompanied by depression, anxiety, OCD

- Metabolic disturbances
  - Hypoglycemia/hyperglycemia
  - Electrolyte disturbances
  - Thyrotoxicosis
  - Anemia
Causes

• Classic “lumping”

• Geriatric Syndrome

• Vestibular Syndrome
Most studies on dizziness are performed in secondary or tertiary centers.

Cross-sectional diagnostic study among elderly patients in Netherlands.

62% were assigned 2 or more contributory causes.
40% have 2 or more causes of dizziness

Vestibular impairment in older people frequently contributes to dizziness as part of a geriatric syndrome.

Authors: David J Ahearne and Dolores Umapathy

Peripheral vestibular causes of dizziness (n=24):
- 16 BPPV – 7 definite, 8 probable
- 13 PVI (non-specific, endolymphatic hydrops, post-traumatic)
- (some patients have more than one).

Central vestibular causes of dizziness (n=10):
- 1 cerebello-pontine angle meningioma
- 2 other cerebellar pathology
- 4 cerebrovascular disease
- 1 migraine
- 2 movement disorder (Parkinson’s disease/progressive supranuclear palsy).

General medical/cardiac causes (n=26):
- 21 orthostatic hypotension
- 3 peripheral neuropathy
- 3 atrial fibrillation
- 2 anaemia
- 1 renal failure
- 1 bradycardia
- 1 proximal myopathy
- (24 patients had more than one).

Fig 1. Venn diagram showing diagnosed peripheral and central vestibular, general medical and cardiac causes of dizziness. BPPV = benign paroxysmal positional vertigo; PVI = peripheral vestibular impairment.
Causes

• Classic “lumping”

• Geriatric Syndrome

• Vestibular Syndrome
• Cross sectional study of adults with dizziness in ER

• Asked to report symptoms in open-ended, multi-response, single-choice and directed formats

• 62% selected more than one dizziness subtype

• 70% NOT identifying vertigo initially later confirmed “spinning or motion” on direct questioning
• Time course, associated symptoms and provoking and aggravating factors seem to be more consistent than description
  – Head movement = vertigo
  – Worse with postural change = orthostasis
  – Warmth = presyncope
  – Stress = vasovagal
  – Ambulation only = disequilibrium

• “TITRATE”
  – TI (Timing) -- TR (Triggers) -- A -- TE (Targeted Exam)
# Vestibular Syndrome

<table>
<thead>
<tr>
<th>EPISODIC</th>
<th>ACUTE</th>
<th>CHRONIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seconds to &lt;6 hours</td>
<td>~24 hrs Continuous/persistent</td>
<td>&gt;1 month</td>
</tr>
<tr>
<td>1. Triggered</td>
<td>HIGHER RISK FOR STROKE*</td>
<td>Typical - partial recovery from prior vestibular syndrome, anxiety/phobia</td>
</tr>
<tr>
<td>• Orthostatic hypotension</td>
<td>Vestibular neuritis / labrynthitis</td>
<td>Neurologic disorders</td>
</tr>
<tr>
<td>• BPPV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Spontaneous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Vestibular Migraine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Meniere’s Disease</td>
<td></td>
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- *HINTS Exam (distinguish acute vestibular syndrome from stroke) -- [https://youtu.be/1q-VTKPweuk](https://youtu.be/1q-VTKPweuk)
- [https://youtu.be/bUzKZEqya1U](https://youtu.be/bUzKZEqya1U)
Causes

• Classic “lumping”

• Geriatric Syndrome

• Vestibular Syndrome
Medications

- Obligatory review with geriatric population
- Anti-hypertensives
- Narcotics, neuropathic agents
- Anti-depressants, anxiolytics
- Anticonvulsants
- Rebound dizziness from dizziness suppressants
What are the testing options?
Exam

- Findings/maneuvers may help illicit the presence or type of dizziness
  - Orthostatic vital signs
  - Dix-Hallpike maneuver
  - ENT – impaction, middle ear disease
  - Vision evaluation
  - Cardiac arrhythmias, murmurs
  - Neurologic exam, cerebellar testing, Romberg

- What findings are present (when compared to controls) for general dizziness (College et al, 1996)?
  - Heel-knee test
  - Abnormal gait
  - Head turning
  - Romberg
Testing

- Audiology testing for Meniere’s, acoustic neuroma
- CBC, blood glucose, BMP, LFT, thyroid tests may be helpful
- Holter monitors for arrhythmias
  - Identified as cause 7% of time without other cardiac symptoms
- Tilt-table test
- CT/MRI...
Independent predictors of serious neurologic diseases were imbalance, age > 60, focal neurologic abnormality.
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Retrospective study from EMR in 2013 from Dutch general practices of what physicians actually do in managing dizziness in the elderly

Strategies employed

- Wait-and-see 28.4%
- Education and advice 28%
- Additional test 27% (blood work 22%)
- Medications prescribed and adjusted 18.7% (11% reduction or d/c of med)
- Referred to specialist 19% (neurologist, cardiologist, physiotherapist)
General Options

- General
  - Correct what can be corrected (vision, hearing)
  - Address polypharmacy
  - Adaptive equipment
  - Optimize chronic condition management

- Treat specific diseases causing the dizziness (Epley maneuver, arrhythmias, etc.)

- Anti-histamines/anti-cholinergics for SHORT-TERM, physical therapy (not well studied), vestibular rehab, balance training/Tai Chi (studies support for improved balance)
240 patients > 70 years of age at tertiary center

General Vestibular Rehab (VRT)

63% had no specific cause to dizziness found

Significant improvement in dizziness question scales at 3 weeks versus non-VRT
Internet-Based Vestibular Rehabilitation for Older Adults
With Chronic Dizziness: A Randomized Controlled Trial in Primary Care

- Single-center, single-blind randomized controlled trial of internet vestibular rehab versus usual care

- [https://balance.lifeguidehealth.org](https://balance.lifeguidehealth.org)

- >50 years of age with dizziness worsened with head movement

- Scores were significantly improved but lost significance at 6 months (due to improvement in the control group)
Prospective study of Zoloft in patients with dizziness > 6 months in absence of neurologic disease

16 week study, n = 24 patients

Dosage 25 – 200mg daily (average 100mg)

Significantly reduced dizziness scores on scales
CHIROPRACTIC CARE FOR OLDER ADULTS: EFFECTS ON BALANCE, DIZZINESS, AND CHRONIC PAIN

Cheryl Hawk, DC, PhD, and Jermlyn Cambron, DC, PhD

RESEARCH ARTICLE

Efficacy and safety of acupuncture for dizziness and vertigo in emergency department: a pilot cohort study

Chih-Wen Chiu, Tsung-Chieh Lee, Po-Chi Hsu, Chia-Yun Chen, Shun-Chang Chang, John Y. Chiang, and Lun-Chien Lo
Objectives

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Summary

• In the elderly:
  – Dizziness often has more than one cause
  – Time course, associated symptoms and triggers may help elucidate cause (TITRATE) better than classic “lumping”
  – Treatment options or outcomes not well studied, but vestibular rehab can helpful regardless of type of dizziness and SSRI’s may be helpful in chronic cases
Questions???
References

• Ahearn, David, Umapathy, Dolores. Vestibular Impairment in older people frequently contributes to dizziness s part of a geriatric syndrome. Clinic Medicine, Royal College of Physicians. Volu 15, No 1: 25-30. 2015.
• Smirnova, Alina, Bell, Stephanie. Still dizzy after all these years: a 90-year old woman with a 54-year history of dizziness. BMJ Case Reports 2011; doi: 10.1136/bcr.05.2011.4247.