Demystifying the dizzy patient: What does the evidence tell us?

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Geriatric Grand Rounds
12/18/2014

When selecting a grand rounds topic...

“Pick something you’re excited about!”
“Don’t pick something you hate...”
“Pick something you want to spend 3-4 weeks reading about.”

Instead I chose based on the following:
  - Interest
  - Intimidation
  - Fear...

Something common that I will deal with time and time again, and thus should know something about!
CHALLENGE #1 – Look around the room and find someone who doesn’t cringe when they see a patient with chief complaint of dizziness.

Scope of Problem

Older patients
- >65 – 30-40% of patients report chronic or recurrent dizziness (Tinetti, Sloane)
- >85 – 50% of patients (Jonsson)

- Dizziness & imbalance lead to approx. 700,000 ED or hospital visits annually
- Frequent rx of potentially harmful medications
  - 36% on diuretic (for BPPV)
  - 25% on anxiolytic
  - 21% meclizine

Major source of morbidity:
Chronic dizziness is associated with anxiety, depression, falls, and social or behavioral avoidance (Tinetti 2000, 2001)
Learning Objectives

• What factors predispose elderly patients to dizziness?
• How should we conceptualize and categorize dizziness?
• Are there evidenced-based components of the H&P or other testing that are actually helpful?
• What options are there for treatment, and how well do they work?
Why is dizziness so common in the elderly?

Symptoms often associated with a wide range of underlying conditions, many of which are more prevalent in the elderly:

- Orthostasis
- Heart failure
- Arrhythmias
- Vestibular disease
- Neuropathy
- C-spine pathology
- CNS disorders...

Environmental and lifestyle factors more prevalent in older patients:

- Polypharmacy
- Deconditioning
- Nutritional issues

Physiologic changes with age:

- Decline in acuity of sensory and motor pathways
- Deterioration of integration mechanisms in the CNS

Balance: a function of multiple sensory systems, many of which deteriorate with advancing age.
Physiologic Changes – Touch & Proprioception

Advancing age leads to...
- Decline in vibration and touch thresholds in older individuals (Wiles, 1991)
- Decline in ability to detect position and direction of joint movements (Sturnieks, 2008)
- Impaired postural control with high levels of visual stimulation (Peteika, 1990)

Physiologic Changes – Vestibular System

Advancing age leads to...
- Decreased number of hair cells in the semicircular canals
  - >age 70 (Rosenhall 1973)
  - >age 50 (Ishiyama 2009)
- Decreased number of primary and secondary vestibular-cerebellar nerve fibers (Tang 2001)
Vestibular system

Advancing age leads to...

- Decreased number of hair cells in the semicircular canals
  - >age 70 (Rosenhall 1973)
  - >age 50 (Ishiyama 2009)
- Decreased number of primary and secondary vestibular-cerebellar nerve fibers (Tang 2001)
- Steady decline in vestibulo-ocular reflex over time (Baloh 2003)

Older individuals are more reliant on vision for postural control (Poulain 2008), which is problematic because...
...multiple components of the visual system also decline with age

**Sensory**
Visual acuity and contrast sensitivity both decline with age (Ishigaki 1994)
- Affects ability to accurately judge distances and avoid obstacles
- Both are associated with increased falls (Lord 2001)

**Motor**
Decline in smooth pursuit (Moschner 1994) and fixation (Kerber 2006)
- Ultimately results in images not remaining stationary on the retina

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**Physiology – Motor system**

Gradual loss of limb muscle fibers and motor units beginning at age 50, leading to 50% loss by age 80 (Faulkner 2007)
- Seen in sedentary and active individuals

Strength and muscle control also affected by age-related slowing of fiber contraction speed (Roos 1997)
Multiple reasons why elderly people as a whole are more likely to have dizziness

But what are the options on how to approach an individual patient?

Learning Objectives

• What factors predispose elderly patients to dizziness?
• How should we conceptualize and categorize dizziness?
• Are there evidenced-based components of the H&P or other testing that are actually helpful?
• What options are there for treatment, and how well do they work?
Dizziness = A subjective experience

• Often difficult for Pt’s to explain and describe
  – Dizziness, whirling, weakness, “almost blacked out,” lightheaded, faint, fatigued, “unbalanced”
• Frequent overlap in sx description as well as underlying processes
• Can have multitude of underlying issues, both benign and more serious

Four classic subtypes of dizziness

1) Vertigo
   – Arises from asymmetry of vestibular system, peripheral or central
   – Patients describe sensation of motion, though classic “spinning sensation” is often unreliable
     • Objective vertigo – objects moving around them
     • Subjective vertigo – feels like they are spinning
Four classic subtypes of dizziness

2) Presyncope
- “nearly blacked out”, “nearly fainted”
- Sensation typically lasts seconds to minutes
- Accompanied by lightheadedness, warmth, diaphoresis, nausea, vision blurring
- Typically occurs when seated or standing, rarely when lying down
- Raises concern for cardiovascular cause, either benign (vasovagal) or more serious (arrhythmia, outflow obstruction, carotid stenosis, etc.)

3) Disequilibrium – sense of imbalance that occurs with walking
- May be a presenting sx of multiple processes: neuropathy, gait disorder, vestibular or cerebellar disorder, Parkinson’s, C-spine pathology, visual impairment
- Good news: less likely to be cardiac etiology or medication related

Drachman 1972
Four classic subtypes of dizziness

4) Generalized dizziness
   – Difficult to describe – “I’m just dizzy”
   – Commonly associated with psychiatric disorders (Kroenke 1992)
   – More likely than other types to result from hypoglycemia or medication effects (Jaap 1998)

How useful is this classification scheme?

Does assigning a dizziness type actually help make a diagnosis or relieve symptoms?

- Cross-sectional study of adults with dizziness in the emergency department
- 872 patients reporting “dizzy, light-headed, or off-balance”
  - Asked to report sx in open-ended, multi-response, single-choice, and directed formats
- Results
  - 62% selected more than one dizziness subtype
  - 54% chose variable subtype depending on question format
  - 70% of patients NOT identifying vertigo initially later confirmed “spinning or motion” on direct questioning


- Review of five observational studies of patients with confirmed cardiovascular cause of dizziness, more specifically vertigo
- Studies included a total 1659 dizzy patients later diagnosed with either myocardial infarction, orthostatic hypotension, or syncope
- Results
  - Vertigo present in 63% of patients
  - 37% reported vertigo as the only dizziness type
Maarsingh 2010. “Causes of Persistent Dizziness in Elderly Patients in Primary Care”

- 417 patients aged ≥65 in Dutch primary care settings
- 44% met criteria for ≥2 dizziness subtypes
  - Vertigo, presyncope, disequilibrium, generalized dizziness
- 16% could not be accurately classified
- 62% had ≥2 contributory causes
- Major and minor contributors – significant overlap
  - Cardiovascular disease
  - Peripheral vestibular disease
  - Psychiatric conditions
    - Mainly anxiety and/or depressive disorder
    - Adverse drug effects contributing in 23% of cases

If patient reporting is so unreliable, what aspects of the history, exam, and other testing can we actually use to help make a diagnosis?
Learning Objective

- What factors predispose elderly patients to dizziness?
- How should we conceptualize and categorize dizziness?
- Are there evidenced-based components of the H&P or other testing that are actually helpful?
- What options are there for treatment, and how well do they work?

CHALLENGE #2: Find an article on dizziness that does NOT emphasize the importance of a “thorough history and physical examination”

Most also emphasize consideration of additional studies (imaging, event monitors, etc.) in patients “at high risk” of underlying issues, regardless of exam findings

- i.e. arguably a substantial majority of elderly patients
**PHYSICAL EXAM**

- **Ocular exam**
  - Pupillary reactivity and EOM
  - Fundoscopic exam – papilledema may be present in absence of changes in visual acuity

- **ENT**
  - Cerumen impactions, foreign bodies
  - Middle ear disease (fluid, scarring)
  - Hearing loss

- **Cardiovascular**
  - Carotid bruits?
  - Heart: murmurs, S3/S4, arrhythmia?

- **Neurologic**
  - Cerebellar function in particular
  - Gait: wide base, unsteadiness, irregularity, lurching
  - Romberg for eval of proprioception
  - Remainder of neurologic exam less helpful unless Pt has other neuro sx

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**Using the history**


- Patient-reported time course, associated symptoms and provoking and aggravating factors seem to be more consistent than description of symptoms
  - Worse with head movement? → vertigo
  - Worse with postural change → orthostasis
  - Postural instability → primary CNS process (cerebrovascular dz, Parkinson’s, etc.)
  - Feeling of warmth, visual blurring → presyncope
  - Observed pallor → presyncope
  - Provoked by stress → vasovagal, generalized dizziness
  - Present mainly with ambulation → disequilibrium
College et al, 1996. Evaluation of investigations to diagnose the cause of dizziness in elderly people: a community based controlled study

Compared findings in chronically dizzy patients age ≥65yrs with age-matched controls

- Physical exam
- Provocation maneuvers
- Lab testing
- ECG
- Electronystagmography
- Posturography
- MRI of head and neck

149 patients, 97 controls, all community dwelling

Findings:
- Dizzy patients more likely to be smokers, have hx MI/angina, stroke, ear disease, poor vision
- Taking an average of 3 medications compared to 1 med for controls
- Diagnosis actually found in 96% of patients
  - Most common: cerebrovascular disease, cervical spondylosis, anxiety/hyperventilation
- 85% of patients had 22 underlying causes of dizziness
- No difference in lab tests, ECG abnormalities, 24-hour ECG monitoring, or MRI

<table>
<thead>
<tr>
<th>Procedure</th>
<th>dizzy group (n = 149)</th>
<th>control group (n = 97)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor function</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patellar reflex</td>
<td>69 (47)</td>
<td>2 (2)</td>
<td>0.0009</td>
</tr>
<tr>
<td>Increased time to heel-knee</td>
<td>88 (60)</td>
<td>7 (8)</td>
<td>0.0068</td>
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<tr>
<td>Nystagmus</td>
<td>80 (54)</td>
<td>7 (8)</td>
<td>0.0073</td>
</tr>
<tr>
<td>Vestibular function</td>
<td>10 (7)</td>
<td>1 (1)</td>
<td>0.0027</td>
</tr>
<tr>
<td>Vestibular function</td>
<td>60 (41)</td>
<td>34 (35)</td>
<td>0.01</td>
</tr>
<tr>
<td>Balance/proprioception</td>
<td>87 (60)</td>
<td>65 (67)</td>
<td>0.006</td>
</tr>
<tr>
<td>Sensory testing</td>
<td>84 (58)</td>
<td>65 (67)</td>
<td>0.0081</td>
</tr>
<tr>
<td>Locomotion system</td>
<td>77 (52)</td>
<td>32 (33)</td>
<td>0.003</td>
</tr>
<tr>
<td>Lumbar pain</td>
<td>7 (5)</td>
<td>1 (1)</td>
<td>0.09</td>
</tr>
<tr>
<td>Neurological symptoms</td>
<td>6 (4)</td>
<td>0 (0)</td>
<td>0.009</td>
</tr>
<tr>
<td>Visual acuity</td>
<td>49 (34)</td>
<td>3 (3)</td>
<td>0.009</td>
</tr>
<tr>
<td>Less than 50 in both eyes</td>
<td>22 (15)</td>
<td>4 (4)</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Provocational Maneuvers
- Sx provoked in minority of patients
- Changes in BP did not correlate with sx

<table>
<thead>
<tr>
<th>Procedure</th>
<th>dizzy group (n = 149)</th>
<th>control group (n = 67)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperventilation</td>
<td>58 (39)</td>
<td>6 (9)</td>
<td>0.004</td>
</tr>
<tr>
<td>Head turning</td>
<td>51 (35)</td>
<td>8 (12)</td>
<td>0.001</td>
</tr>
<tr>
<td>Hypotensive maneuver</td>
<td>13 (9)</td>
<td>2 (3)</td>
<td>0.13</td>
</tr>
<tr>
<td>Hypervension test</td>
<td>52 (36)</td>
<td>1 (1)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Canine stress reaction</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Provocative change</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive response</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperventilation</td>
<td>14 (9)</td>
<td>1 (1)</td>
<td>0.001</td>
</tr>
<tr>
<td>Hypotensive maneuver</td>
<td>25 (17)</td>
<td>13 (19)</td>
<td>0.008</td>
</tr>
<tr>
<td>No MH in blood pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MH response</td>
<td>64 (44)</td>
<td>60 (88)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Physical Exam
- Multiple findings were slightly more common in dizzy patients
- Largest differences were in abnormal heel-knee, RAM, gait disturbances
College et al, BMJ 1996. Evaluation of investigations to diagnose the cause of dizziness in elderly people: a community based controlled study

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No of subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical vascular disease</td>
<td>155</td>
</tr>
<tr>
<td>Cervical spondylosis</td>
<td>98</td>
</tr>
<tr>
<td>Anxiety or hyperventilation</td>
<td>48</td>
</tr>
<tr>
<td>Poor vision</td>
<td>23</td>
</tr>
<tr>
<td>Postural hypotension</td>
<td>14</td>
</tr>
<tr>
<td>Benign positional vertigo</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>36</td>
</tr>
<tr>
<td>No diagnosis</td>
<td>6</td>
</tr>
<tr>
<td>More than one diagnosis</td>
<td>126</td>
</tr>
<tr>
<td>Neck disease and central vascular disease:</td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>68</td>
</tr>
<tr>
<td>Neither</td>
<td>14</td>
</tr>
<tr>
<td>Poor vision only</td>
<td>0</td>
</tr>
<tr>
<td>Anxiety or hyperventilation only</td>
<td>3</td>
</tr>
</tbody>
</table>

Diagnostic criteria for causes of dizziness

- Benign paroxysmal vertigo: Brief episodes of vertigo on change of position with a positive response to the Hallpike manoeuvre
- Cervical spondylosis: Symptoms on head or neck movement with reduced range of neck movements
- Postural hypotension: Fall of ≥ 20 mm Hg in systolic pressure or of ≥ 10 mm Hg in diastolic blood pressure one minute after standing from the supine position with associated symptoms
- Cerebral vascular disease: Unilateral with or without light-headedness in association with an abnormal gait (stumble a little as you walk) and increased effort and time, with or without loss of power
- Anxiety or hyperventilation: Anxiety score of more than 8 on hospital anxiety and depression scale with or without reproduction of symptoms on hyperventilation
- Poor vision: Visual acuity reduced to less than 6/18 in both eyes
- Other: For example, extracranial, pulsatile, peripheric tinnitus
- No diagnosis possible

**History – Medications**
(Obligatory in a geriatrics presentation)

- Anti-hypertensives
- Analgesics
  - Opiates, neuropathic agents
- Anti-alzheimers
  - (menantine, rivastigmine)
- Antipsychotics
- Antidepressants
  - Including SSRIs, SNRIs, bupropion, mirtazapine
- Anxiolytics
- Anticonvulsants
- Dizziness suppressants
  - Rebound dizziness

All are well known to include dizziness as a side effect

**CHALLENGE #3:** Find an elderly patient who is not on any of these medications (this one might actually be possible...)
And imaging?

CHALLENGE #4: Find an elderly dizzy patient who has NOT had any brain imaging.

Goal of imaging: Presumably to identify dangerous structural pathology causing the dizziness.


• National Health Interview Survey patients ≥65 yrs with balance disorders
  – NHIS: continuous survey of approximately 35,000 households
  – Core set of basic health and demographic questions along with supplemental questions on specific topics (in this case balance disorders)
• Imaging studies had been done in 56.7%
• 59.6% had been diagnosed with a specific balance disorder
• Whether or not someone had imaging did not correlate with establishment of a specific diagnosis.

• Population-based study of 1666 patients ≥45 yrs of age
• All presented to the ED or were admitted with dizziness symptoms
• Results
  – Acute stroke diagnosed in 3.2% of all patients with dizziness (with or without other sx)
  – Stroke diagnosed in 0.7% of patients with isolated dizziness


• Total of 907 patients reporting dizziness, vertigo, imbalance, or disequilibrium as primary symptom
• Patient characteristics:
  – Mean age 59 yrs
  – 33% had had prior episodes of symptoms
  – 19% had isolated dizziness
• Primary outcome: “serious neurologic diagnosis”
  – Ischemic stroke, intracranial hemorrhage, TIA, seizure, brain tumor, demyelinating disease, CNS infection

### TABLE 4. Final Diagnoses for 907 Patients Presenting to the Emergency Department With Dizziness

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Patients, No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious neurologic diseases</td>
<td>49 (5)</td>
</tr>
<tr>
<td>Ischemic stroke</td>
<td>24 (3)</td>
</tr>
<tr>
<td>Transient ischemic attack</td>
<td>8 (1)</td>
</tr>
<tr>
<td>Brain neoplasm</td>
<td>6 (1)</td>
</tr>
<tr>
<td>Intracerebral hemorrhage</td>
<td>5 (1)</td>
</tr>
<tr>
<td>Seizure</td>
<td>4 (&lt;1)</td>
</tr>
<tr>
<td>Demyelinating disease</td>
<td>2 (&lt;1)</td>
</tr>
<tr>
<td>Subarachnoid hemorrhage</td>
<td>0</td>
</tr>
<tr>
<td>Subdural hemorrhage</td>
<td>0</td>
</tr>
<tr>
<td>Epidural hemorrhage</td>
<td>0</td>
</tr>
<tr>
<td>Brain abscess/meningitis</td>
<td>0</td>
</tr>
</tbody>
</table>

35% of patients had neuroimaging (28% CT, 11% MRI, 4% both)
Imaging strongly associated with subsequent primary outcome
But only 7% of imaging studies showed “a relevant finding”

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### TABLE 3. Associated Symptoms in 907 Patients Presenting to the Emergency Department With Dizziness

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Serious neurologic diagnoses (n=287)</th>
<th>Other diagnoses (n=618)</th>
<th>Total (n=905)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea or vomiting</td>
<td>19 (39)</td>
<td>422 (47)</td>
<td>441 (46)</td>
<td>.30</td>
</tr>
<tr>
<td>Light-headedness</td>
<td>19 (39)</td>
<td>290 (34)</td>
<td>309 (34)</td>
<td>.44</td>
</tr>
<tr>
<td>Headache</td>
<td>9 (18)</td>
<td>181 (21)</td>
<td>190 (21)</td>
<td>.72</td>
</tr>
<tr>
<td>Gait disturbance</td>
<td>23 (37)</td>
<td>130 (15)</td>
<td>153 (17)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Visual disturbance/diplopia</td>
<td>7 (14)</td>
<td>92 (11)</td>
<td>99 (11)</td>
<td>.48</td>
</tr>
<tr>
<td>Dizziness</td>
<td>6 (12)</td>
<td>76 (9)</td>
<td>82 (9)</td>
<td>&gt;.99</td>
</tr>
<tr>
<td>URI symptoms</td>
<td>7 (14)</td>
<td>67 (8)</td>
<td>74 (8)</td>
<td>.58</td>
</tr>
<tr>
<td>Sensory disturbance</td>
<td>6 (12)</td>
<td>62 (7)</td>
<td>68 (8)</td>
<td>.26</td>
</tr>
<tr>
<td>Chest pain</td>
<td>2 (4)</td>
<td>67 (8)</td>
<td>69 (8)</td>
<td>.58</td>
</tr>
<tr>
<td>Psychiatric symptoms</td>
<td>1 (2)</td>
<td>65 (8)</td>
<td>66 (7)</td>
<td>.25</td>
</tr>
<tr>
<td>Tinnitus</td>
<td>6 (12)</td>
<td>48 (6)</td>
<td>54 (6)</td>
<td>.06</td>
</tr>
<tr>
<td>Syncope</td>
<td>3 (6)</td>
<td>47 (5)</td>
<td>50 (6)</td>
<td>.75</td>
</tr>
<tr>
<td>Confusion</td>
<td>3 (6)</td>
<td>37 (4)</td>
<td>40 (4)</td>
<td>.47</td>
</tr>
<tr>
<td>Hearing loss</td>
<td>1 (2)</td>
<td>35 (4)</td>
<td>36 (4)</td>
<td>.72</td>
</tr>
<tr>
<td>Speech disturbance</td>
<td>10 (20)</td>
<td>13 (2)</td>
<td>23 (3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Dizziness</td>
<td>7 (14)</td>
<td>16 (2)</td>
<td>23 (3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Unilateral weakness</td>
<td>9 (18)</td>
<td>8 (1)</td>
<td>17 (2)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

*NOJ = not otherwise specified, URI = upper respiratory tract infection.
*Data are presented as No. (percentage) of patients.
*Sensory neurologic symptoms comprises a composite of ischemic stroke, transient ischemic attack, subarachnoid hemorrhage, subdural hemorrhage, subdural hematoma, brain metastasis, sepsis, demyelinating disease, and brain abscess/meningitis.
*Other presenting symptoms include syncope, vertigo NOJ, benign paroxysmal positional vertigo, vestibular neuritis, Meniere disease, concussion, migraine, gait disturbance, NOJ orthostatic/dizziness, syncope, diastolic NOJ, psychiatric disorder NOJ, syncope, acute coronary syndrome, stroke, anemia, cocaine, heart failure, deconditioning, hypertensive emergency, drug or substance ingestion/noxious fumes, hypoglycemia, electrolyte disorder, anemia, or gastrointestinal bleeding, systemic infection, and other.
What have we learned so far?

- Dizziness is more common in elderly patients for a variety of reasons, including changes in physiology with aging.
- Attempting to categorize dizziness into subtypes is of questionable benefit.
- An alternative possibly more useful method of consideration is to consider what underlying processes might be more or less likely in a given patient.
- Patient reports of time course, associated sx, and aggravating factors are more useful than sx description themselves.
- Imaging studies are frequently done but are only rarely helpful in identifying a cause of dizziness.

Okay, but what options do we have to actually help people?

Learning Objectives

- What factors predispose elderly patients to dizziness?
- How should we conceptualize and categorize dizziness?
- Are there evidenced-based components of the H&P or other testing that are actually helpful?
- What options are there for treatment, and how well do they work?
Treatment options

General interventions
- Vision and hearing correction
- Reducing polypharmacy
- Provide adaptive equipment and safety training
- Optimize management of underlying conditions

Disease specific
In patients with clear diagnosis, obvious treatment focus is to correct the underlying issue (BPPV, labrynthitis, CNS pathology, CV process, etc.)

“I’m just dizzy”

Patients with chronic dizziness are frequently treated with potentially harmful medications
- e.g. anti-histamines, anti-cholinergics
- Is there any evidence for how well these work?
- Are there any other medications we should consider?

What about non-pharmacologic options?
- Physical therapy
- Vestibular rehab
- Balance training – tai chi
Medications

Anti-histamines
- **Meclizine, **dimenhydrinate (*dramamine*)
- Mechanism: prevent histamine release in nerve endings and blood vessels
- Studied mostly in acute vertigo where they do improve symptoms
- Notoriously poor response rate for chronic symptoms
- Equally notorious risk of significant SE

Anti-cholinergics
- **Scopolamine, glycopyrolate**
- Mechanism: suppress conduction in vestibular-cerebellar pathways
- Also mainly studied in acute vertigo

**Many SE associated with all of the above

Anti-depressants

- Multiple positive studies of SSRIs in *adult patients* with chronic dizziness, but not many in the *elderly*
- Shown to be particularly effective in patients with concurrent psychiatric diagnoses (Staab 2005)
  - Major: depression, anxiety, panic disorder
  - Minor: somatoform disorder, social anxiety
- Minimal to no effect in patients with CNS pathology or contributing CV causes (Staab 2002)
Physical Therapy & Exercise

Aside from vestibular rehabilitation therapy, not well studied for dizziness specifically

Multiple studies showing improved stability and fall reduction
  – Strength and balance training
  – Tai chi


- Reviewed 11 studies on patients with balance disorders
  – Not dizziness specifically
- All included 8-16 weeks of treatment
- Consistently found improved balance, flexibility, and strength associated with tai chi
Vestibular Rehabilitation

Initially developed for patients with classic vertigo

Variable interventions depending on center and practitioner

Length of rehab also variable but typically at least weeks

Yun Jung et al 2007. “Effect of vestibular rehabilitation on dizziness in the elderly”

- 153 participants age >70yrs with chronic dizziness
  - Sx classification: rotational or positional vertigo, disequilibrium, unsteadiness, lightheadedness, orthostasis, impending fainting
  - Included patients with abnormal exam findings and/or when CNS pathology was initially suspected but later ruled out
  - Excluded patients with specific diagnoses for their dizziness
    - All participants essentially fell into category of “other”
  - 107 patients prescribed vestibular rehab therapy
  - 46 patients told to “carry out daily routine physical activity”

- Results based on changes in self-reported symptoms on two separate scales assessing sx severity and impact
Yun Jung et al 2007. “Effect of vestibular rehabilitation on dizziness in the elderly”

Results

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>3 weeks</th>
<th>3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRT VAS score</td>
<td>6.8±1.86</td>
<td>5.28±1.38 (p=.001)</td>
<td>3.02±1.32 (p=.001)</td>
</tr>
<tr>
<td>Non VRT VAS score</td>
<td>6.63±1.75</td>
<td>5.8±1.77 (p=.068)</td>
<td>4.6±1.46 (p=.001)</td>
</tr>
<tr>
<td>VRT ABC score</td>
<td>41.8±10.5</td>
<td>52.1±6.83 (p=.001)</td>
<td>65.55±6.48 (p=.001)</td>
</tr>
<tr>
<td>Non VRT ABC score</td>
<td>44.67±11.52</td>
<td>49.8±9.93 (p=.04)</td>
<td>59±4.33 (p=.01)</td>
</tr>
</tbody>
</table>

Table 1: Verbal analogue scale

Grade 0: No dizziness
Grade 1: Slight dizziness on working
Grade 2: Moderate dizziness on working
Grade 3: Severe dizziness on working

Table 2: Activities-specific balance confidence scale item

Vestibular Rehabilitation

  - 22 participants age 65-80 yrs with chronic dizziness
    - Included patients with true vertigo as well as dizziness from other causes (e.g. cardiovascular and proprioceptive dysfunction)
    - Excluded patients with infrequent attacks or known neurologic diagnoses (e.g. Parkinson’s, prior cerebral hemorrhage)
  - Randomized to 7 weeks of treatment vs. “waiting list” control group
    - Rationale: patients with chronic dizziness also endorse anxiety, hyperventilation, or avoidance of situations and movements that might provoke the dizziness
  - Results:
    - Improved walk times, reported sx severity, and DHI scores
    - No change in reported level of anxiety or fear of falling
  - Caveat: no description of which patients in the treatment group experienced benefit
Dizziness Handicap Index (DHI) – Jacobson et al, 1990

- Self-report questionnaire assessing degree of disability associated with dizziness
- Not dependent on underlying cause
- 3 domains, total of 25 questions
  - Answers: “yes” → 4 pts, “sometimes” → 2 pts, “no” → 0 pts
- Scores range 0 to 100, higher scores indicating greater perceived disability
  - Mild: 0-30 pts, Moderate: 31-60 pts, Major 61-100 pts
- When looking at the efficacy of interventions, meaningful change in sx correlates with Δ ≥ 18

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Learning Objectives

What factors predispose elderly patients to dizziness?
- Comorbidities and characteristics increase in prevalence in elderly patients
- Multiple physiologic changes potentially affecting balance mechanisms in elderly adults

How should we conceptualize and categorize dizziness?
- Classic dizziness subtype structure not necessarily useful in chronically dizzy patients where causal process is likely to be multifactorial
- May be more appropriate to classify patients based on known or suspected underlying comorbidities

Learning Objectives

Are there evidenced based components of the H&P or other testing that is actually helpful?
- Time course and aggravating/alleviating factors possibly more accurate than description of dizziness
- Useful neurologic exam findings: gait disturbance, diplopia, objective weakness
- Imaging helpful generally only if there are concerning exam findings
  - Though obtaining an imaging study may be reassuring for both provider and patient
Learning Objectives

What options are there for treatment, and how well do they work?

– *Given likelihood of multifactorial process, treatment is limited*
– *Medications minimally helpful and frequently associated with SE*
– *Consider use of SSRI if patient has concurrent psychological comorbidities*
– *Vestibular rehab helpful even in absence of vertigo or clear vestibular process*
– *Strength and balance training to minimize fall risk and maximize functionality*

Thank you!
Questions?
References


References