The Dizzy patient: Evidence-based practice

Yuri Agrawal, M.D.
Otolaryngology-Head and Neck Surgery
Johns Hopkins University School of Medicine
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Disclosures: None
Outline

1. Definitions
   - Dizziness
   - Falls

2. Magnitude of the problem

3. Risk factors

4. Management guidelines

5. Johns Hopkins Falls Prevention Clinic
Definitions
Presbyvertigo
Age-related dizziness

Causes: Vestibular, visual, neurologic, psychological, polypharmacy, cardiovascular, orthostasis

Presbystasis
Age-related imbalance/disequilibrium

Causes: Weakness, peripheral sensory, arthritis

Definitions

Age-related vestibular loss

SUB-CLINICAL

CLINICAL

VSR

VOR

Presbyvertigo
Age-related dizziness

Causes: Vestibular, visual, neurologic, psychological, polypharmacy, cardiovascular, orthostasis

Presbystasis
Age-related imbalance/disequilibrium

Causes: Weakness, peripheral sensory, arthritis
Magnitude of the problem
Prevalence of dizziness and falls in the US population

Data from NHANES 2001-2003
Impact of dizziness

• 27% changed jobs, 21% gave up work, 50% had reduced efficiency at work

• 57% disrupted social life, 35% family difficulties, 50% traveling difficulties

• Dizziness one of most influential symptoms affecting quality of life in older individuals

• 2-3 fold increased risk of falling
Impact of falls

• > 1/3 community-dwelling adults >65yo fall each year

• 10% of falls result in major injuries such as hip fractures

• 10-fold increased risk of nursing home placement after fall with injury

• Costs estimated to exceed $20 billion annually
Risk factors
Most important risk factors

1. Previous falls
2. Medications
3. Strength, balance and gait impairment
   • Age-related vestibular loss
Vestibular system: anatomy

Balance
vestibular system

Hearing
cochlea

Prevalence: US National Health and Nutrition Examination Survey

Prevalence of balance dysfunction increases with age.

Vestibular dysfunction and falls

Vestibular dysfunction associated with increased odds of falling

Head impulse test

- Clinical measure of **semicircular canal function**, look for **gaze-stabilizing compensatory saccade** (rapid eye movement)

Vestibular loss associated with reduced gait speed

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Gait Speed (&lt; 1m/s)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio</td>
<td>P-value</td>
</tr>
<tr>
<td>Horizontal HIT</td>
<td>5.04</td>
<td>0.026</td>
</tr>
<tr>
<td>Age</td>
<td>0.88</td>
<td>0.074</td>
</tr>
<tr>
<td>Gender</td>
<td>0.89</td>
<td>0.909</td>
</tr>
<tr>
<td>Somatosensory function</td>
<td>0.51</td>
<td>0.113</td>
</tr>
<tr>
<td>Visual acuity</td>
<td>1.88</td>
<td>0.031</td>
</tr>
<tr>
<td>Grip strength</td>
<td>0.94</td>
<td>0.204</td>
</tr>
</tbody>
</table>
Vestibular loss associated with increased fall risk

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Fall in the last 5 yrs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio</td>
<td>P-value</td>
</tr>
<tr>
<td>Horizontal HIT</td>
<td>5.17</td>
<td>0.024</td>
</tr>
<tr>
<td>Age</td>
<td>1.00</td>
<td>0.962</td>
</tr>
<tr>
<td>Gender</td>
<td>1.67</td>
<td>0.601</td>
</tr>
<tr>
<td>Somatosensory function</td>
<td>0.96</td>
<td>0.916</td>
</tr>
<tr>
<td>Visual acuity</td>
<td>0.88</td>
<td>0.607</td>
</tr>
<tr>
<td>Grip strength</td>
<td>1.02</td>
<td>0.663</td>
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</tbody>
</table>

Agrawal Y et al, Otol Neurotol 2013
Supportive evidence for a causal association

• Peripheral vestibular dysfunction significantly more prevalent in older adult fallers (N=25) compared to age-matched non-fallers (N=16) (Liston et al, Age Ageing 2013)

• Vestibular asymmetry predicts increased 1-year prospective falls risk in 55 subjects (OR 3.4), (Hansson et al, BMC Geriatrics 2013)

• Vestibular asymmetry observed in a majority of patients with fall-related wrist and hip fractures
Management guidelines
US Preventive Services Task Force:

- Recommends exercise or physical therapy and vitamin D supplementation in community-dwelling adults ≥ 65 years at increased risk for falls (Grade B recommendation)

- Does not recommend multifactorial risk assessment in any adult ≥ 65 years, but only in individual cases based on circumstances of prior falls, comorbid medical conditions, and patient values (Grade C recommendation)
AGS Guidelines

• American Geriatrics Society 2010:
  – Older persons who present for medical attention because of a fall, report recurrent falls in the past year, or report difficulties in walking or balance (with or without activity curtailment) should have a multifactorial fall risk assessment.
CDC Guidelines

• 4 essential components of a multidisciplinary fall risk assessment:

1. Balance and gait
2. Vision
3. Multiple medications use (polypharmacy)
4. Home safety

_Falls often multifactorial so need to take a systematic approach_
Many falls can be prevented. By making some changes, you can lower your chances of falling.

Four things YOU can do to prevent falls:

1. Begin a regular exercise program
2. Have your health care provider review your medicines
3. Have your vision checked
4. Make your home safer

“We feel stronger when we walk frequently. And we have a more positive outlook.”
Balance and Gait

• Most important of the 4 risk factors

• Timed Up and Go:
  – Efficient screening test
  – > 14 seconds:
    increased fall risk

• EXERCISE!
  – Progressive balance, strength & endurance
Vision

• Most common cause of low vision in the elderly:
  – **PRESBYOPIA**: age-related decline in near vision

• Other big 3 causes of age-related visual loss:
  – Cataracts
  – Glaucoma
  – Macular Degeneration
Vision

- Expedited first cataract surgery shown to significantly reduce fall risk
Polypharmacy

- Use of $\geq 4$ prescription medications, regardless of which medications they are, increases fall risk

- **Psychoactive** medications (sedatives, antipsychotics, and antidepressants), **anticonvulsants**, and **antihypertensive** medications most significant risk
## Medications: Beers criteria

<table>
<thead>
<tr>
<th>Disease or Syndrome</th>
<th>Drug(s)</th>
<th>Recommendation, Rationale, Quality of Evidence (QE) &amp; Strength of Recommendation (SR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of falls or fractures</td>
<td>Anticonvulsants, Antipsychotics, Benzodiazepines, Nonbenzodiazepine hypnotics, Eszopiclone, Zaleplon, Zolpidem, TCAs/SSRIs</td>
<td>Avoid unless safer alternatives are not available; avoid anticonvulsants except for seizure. Ability to produce ataxia, impaired psychomotor function, syncope, and additional falls; shorter-acting benzodiazepines are not safer than long-acting ones. QE = High; SR = Strong</td>
</tr>
</tbody>
</table>
Medications:

**STopp** and **START** criteria

**STopp:** Screening Tool of Older People’s potentially inappropriate Prescriptions.

The following drug prescriptions are potentially inappropriate in persons aged ≥65 years.

**H Drugs that adversely affect fallers**

1. Benzodiazepines.
2. Neuroleptic drugs.
3. First-generation antihistamines.
4. Vasodilator drugs with persistent postural hypotension, i.e. recurrent >20 mmHg drop in systolic blood pressure.
5. Long-term opiates in those with recurrent falls.

**START:** Screening Tool to Alert doctors to Right, i.e. appropriate, indicated but often omitted Treatments.

These medications should be considered for people ≥65 years of age with the following conditions, where no contraindication to prescription exists.
Medications

• Trade-offs
  – Diseases, e.g. heart failure, hypertension associated with poor health outcomes (e.g. heart attack, stroke), but the medications that treat them associated with fall risk
  – Patients need to weigh benefit of treating disease with risk of medications
  – Reduce dose or eliminate high-risk medications
Home Safety

• Common home hazards:
  – Poor lighting
  – Tripping hazards (e.g. throw rugs, telephone cords, cables)
  – Lack of handrails
  – Objects stored close to the ground or on high shelves
Home Safety

This checklist is based on the original version printed by the Centers for Disease Control and Prevention. Support for this version was provided by MetLife Foundation.

2005

CDC Foundation

MetLife Foundation

Department of Health and Human Services
Centers for Disease Control and Prevention

Check for Safety

A Home Fall Prevention Checklist for Older Adults
Home Safety

FLOORS: Look at the floor in each room.

Q: When you walk through a room, do you have to walk around furniture?
☐ Ask someone to move the furniture so your path is clear.

Q: Do you have throw rugs on the floor?
☐ Remove the rugs or use double-sided tape or a non-slip backing so the rugs won’t slip.

Q: Are there papers, books, towels, shoes, magazines, boxes, blankets, or other objects on the floor?
☐ Pick up things that are on the floor. Always keep objects off the floor.

Q: Do you have to walk over or around wires or cords (like lamp, telephone, or extension cords)?
☐ Coil or tape cords and wires next to the wall so you can’t trip over them. If needed, have an electrician put in another outlet.

“Last Saturday our son helped us move our furniture. Now all the rooms have clear paths.”
Home Safety

STAIRS AND STEPS:
Look at the stairs you use both inside and outside your home.

Q: Are there papers, shoes, books, or other objects on the stairs?
   □ Pick up things on the stairs. Always keep objects off stairs.

Q: Are some steps broken or uneven?
   □ Fix loose or uneven steps.

Q: Are you missing a light over the stairway?
   □ Have an electrician put in an overhead light at the top and bottom of the stairs.

Q: Do you have only one light switch for your stairs (only at the top or at the bottom of the stairs)?
   □ Have an electrician put in a light switch at the top and bottom of the stairs. You can get light switches that glow.

Q: Has the stairway light bulb burned out?
   □ Have a friend or family member change the light bulb.

Q: Is the carpet on the steps loose or torn?
   □ Make sure the carpet is firmly attached to every step, or remove the carpet and attach non-slip rubber treads to the stairs.

Q: Are the handrails loose or broken? Is there a handrail on only one side of the stairs?
   □ Fix loose handrails or put in new ones. Make sure handrails are on both sides of the stairs and are as long as the stairs.
Home Safety

**KITCHEN:** Look at your kitchen and eating area.

**Q:** Are the things you use often on high shelves?

☐ Move items in your cabinets. Keep things you use often on the lower shelves (about waist level).

**Q:** Is your step stool unsteady?

☐ If you must use a step stool, get one with a bar to hold on to. Never use a chair as a step stool.

**BATHROOMS:** Look at all your bathrooms.

**Q:** Is the tub or shower floor slippery?

☐ Put a non-slip rubber mat or self-stick strips on the floor of the tub or shower.

**Q:** Do you need some support when you get in and out of the tub or up from the toilet?

☐ Have a carpenter put grab bars inside the tub and next to the toilet.
Home Safety

“"I put a lamp on each side of my bed. Now it’s easy to find the light if I wake up at night.”

BEDROOMS: Look at all your bedrooms.

Q: Is the light near the bed hard to reach?
☐ Place a lamp close to the bed where it’s easy to reach.

Q: Is the path from your bed to the bathroom dark?
☐ Put in a night-light so you can see where you’re walking. Some night-lights go on by themselves after dark.
THANK YOU!