Non-otologic Dizziness

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Dizziness is an imprecise term

- Vertigo (sensation of motion)
- Lightheaded
- Ataxia
- Confusion

Because “Dizziness” is an imprecise term, a major role of the clinician is to sort patients.

Epidemiology of Dizziness

Most dizziness is non-vestibular

29.5% lifetime prevalence of dizziness or vertigo
7% lifetime prevalence of vestibular vertigo, 1-year prevalence is 5.2%

Neuhouser et al, Neurology 65:898-904 2005

More Dizziness #s

- Dizziness is the chief complaint in 2.5% of all primary care visits (Sloane et al, 1989).
- Older people have more dizziness

Diagnostic Categories

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Question 1

- Which category is associated with the most dizziness?
  1. Inner ear disorders
  2. CNS problems (e.g. Stroke)
  3. Blood pressure
  4. Psychological problems
  5. Undiagnosed
Answer 1

- It depends on your referral base
  1. Inner ear disorders (about 50% of ENT, 30% in general)
  2. CNS (about 25% of neurology, 5% everyone else)
  3. Blood pressure (30% of family practice, 5% everyone else)
  4. Psychological problems (15% to 50%)
  5. Undiagnosed (up to 50%)

Diagnostic Categories

- Neurological (i.e. posterior fossa)
- Medical
- Psychological (anxiety, malingering)
- Undiagnosed

Diagnostic Categories – non-otologic dizziness

1. Neurological (i.e. posterior fossa, Migraine)
2. Medical (i.e. low blood pressure)
3. Psychological (anxiety, malingering)
4. Undiagnosed

Causes of neurological dizziness

15-30% subspecialty, 5% ER

- 35% Stroke and TIA (% varies with practice)
- 16% Migraine (% varies with practice)
- Various Ataxias (% varies with practice)
- Seizures (rare)
- Multiple Sclerosis (rare)
- Tumors (very rare)
- Head Trauma
- CSF pressure abnormalities - CSF leak, NPH

Carotid disease does NOT cause dizziness

- Carotids supply anterior brain.
  No dizziness circuitry there.
  Carotid disease causes weakness/numbness/speech disturbance
- Carotid endarterectomy rarely helps dizziness

Posterior Fossa stroke

- 50 year old doctor developed vertigo and unsteadiness
- Continued to operate for a week before seeking medical attention but wife wouldn’t let him drive.
- PICA stroke seen on MRI
Common Strokes with Dizziness

- PICA (lateral medulla and cerebellum) – palatal weakness, hemiataxia, anisocoria
- AICA (pons and cerebellum) – hearing loss
- SCA (cerebellar)


Posterior Inferior Cerebellar Artery (PICA)
Wallenberg’s Syndrome
Lateral Medullary Syndrome

- Adolf Wallenberg
German internist, born November 10, 1862, Preuss.-Stargard, died 1949.

Case (IC)

- Onset of dizziness 1 week ago
- Unable to walk
- Diabetes and new onset a-fib
- Exam:
  - Ataxic but intact VOR
  - No spontaneous nystagmus
  - Neuropathy

Lateral Medullary Syndrome

- Most common “dizzy” stroke
- Generally lack clear localizing findings.
- MRI makes dx.

Lateral Medullary Syndrome

- Usually occluded vertebral

Basilar Artery syndrome (C.A.)

A 44 year old woman was involved in a rear end collision. She had a whiplash injury, and apparently the vertebral arteries in the neck were contused. Several days after the accident she became comatose, and studies suggested complete occlusion of the basilar artery.
Basilar artery case findings (1991 vs. 2001)

- Unsteady Gait  
- Finger to nose ataxia  
- Nystagmus (eyes moving involuntarily)  

Basilar artery strokes are often fatal.

Common features of cerebellar gait ataxia

- Severe impairment of balance (worse than sensory balance disorders)
- Wide based gait
- Often refractory to treatment and time

Anterior inferior cerebellar artery Case

- Woman with diabetes, obesity, hypertension suddenly becomes dizzy, and develops facial weakness in swimming pool.
- Brought into hospital and CT scan shows stroke in pons.

Anterior inferior cerebellar artery AICA syndrome

- Rare stroke
- AICA supplies pons, cerebellum, 8th nerve
- Facial weakness
- Vertigo/hearing loss
- Incoordination

Superior Cerebellar Artery SCA Syndrome

- Rare stroke
- SCA supplies superior cerebellum and midbrain
- Ataxia and diplopia
Paraneoplastic syndromes -- case

- 35 year old woman admitted to hospital because very unsteady – poor coordination
- Many tests were done without a diagnosis. Nobody did a breast exam.
- 1 year later noticed a large breast lump
- Breast cancer removed – but patient left with severe cerebellar syndrome

Paraneoplastic syndromes

- Remote effect of cancer
- Associated with lung and breast cancer
- Vestibulo-cerebellar syndrome – dominated by
  - Ataxia
  - Downbeating Nystagmus
  - Saccadic nystagmus
  - May be related to cellular immunity

Survivor from Colon Cancer

DBN of floccular syndromes (paraneoplastic, Chiari) gets greater on lateral gaze

The other pattern of paraneoplastic nystagmus is opsoclonus/saccadic flutter

Multiple Sclerosis (MS)

- No single pattern
- Multiple lesions distributed in time and space

Multiple Sclerosis (MS)

- INO is common in MS
Chiari Malformation: Case
- Dock worker in Baltimore came in because gets dizzy when lifts heavy boxes
- Examination: unsteady, downbeating nystagmus.
- MRI showed cerebellar tonsils lower than normal.

Downbeating Nystagmus may be clue to underlying cerebellar degeneration or Chiari

Chiari Malformation
- Cerebellar tonsils herniate downward
- Adult onset
- Straining or coughing produces headache or fainting
- Unsteadiness
- Nystagmus

Treatment: Suboccipital decompression (rarely indicated)

Arrow points to cerebellar tonsils. This surgical exposure is larger than would be used in real operation.

Non-otologic ataxias – all of neurology?
- Cerebellar
- Basal Ganglia
- Hydrocephalus
- Sensory loss (B12)
- Periventricular WM lesions
- CSF leak
- Drugs (e.g. anticonvulsants)
- Degenerations (e.g. PSP, SCA)
- Palatal myoclonus

Brain Tumors Causing Dizziness
We worry a lot about these rare disorders
- Acoustic Neuroma (rare)
- Meningioma
- Cerebellar astrocytoma
- Cerebellar hemangioblastoma
- 4th ventricular ependymoma
Cerebellar Astrocytoma Case
- Young woman in residency training
- Developed a headache and went to ER. In ER a CT scan was done.
- A large tumor was found occupying most of right side of cerebellum.
- Tumor was removed – after operation patient developed incoordination R side. Over 6 months, has improved so much can return to training program.

Cerebellar Astrocytoma
- Largely in children
- Slowly growing tumor
- Cerebellar hemisphere syndromes
- Resection often cures

Pontine Astrocytoma
- Largely in children
- Slowly growing tumor
- Affects cerebellar connections
- No treatment – fatal disease

Pontine Astrocytoma
- Severe ataxia
- Strong positional nystagmus

Cerebellar Medulloblastoma
- Mainly affects children
- Begins in cerebellar nodulus -- vestibulocerebellum
- Hydrocephalus (projectile vomiting) and cerebellar signs.
- Treat with resection, chemotherapy and radiation.
- 5 year survival – 80%

Periodic Alternating Nystagmus (PAN)
- Congenital and acquired forms. Acquired form usually from cerebellar nodulus lesion (such as medulloblastoma). Usual period is 200 sec. Responds to medication (baclofen), but not to PT.
Treatment of Central Dizziness

- Vestibular Suppressants
- Vestibular rehabilitation
- Environmental adaptations

Case

- 8 Year old became dizzy playing video games
- Mother noted the eyes jumped
- Transient confusion

In the clinic he had a spell of dizziness with clear nystagmus

EEG shows seizure during nystagmus

Seizures causing Dizziness

- Quick spins (1-2 seconds)
  - Also caused by vestibular nerve irritation
- Confusion and dizziness
- May be triggered by flashing lights
- Head injury is common
- Oxcarbamazine or other anticonvulsants may stop them

Migraine & Vertigo: Prevalence

- Migraine:
  - 14% of U.S. population has Migraine†
  - 20-30% of women childbearing age
- Vertigo: 35% of migraine population.*
- Migraine + vertigo (MAV):
  - 1% of entire population (Neuhauser, 2006)

† Tfelt-Hansen and Stewart 1993; Stewart et al. 1994
Diagnosis of MAV

Nystagmus

- Often low amplitude downbeating or upbeating nystagmus, commonly present during positional testing.
- Bitorsional is common too (looks like bilateral BPPV)
- ? Due to cerebellar disturbance


Diagnosis of MAV

Clinical judgment

- Headaches and dizziness
- Lack of alternative explanation (normal otological exam, neurological exam, CT)
- High index of suspicion in women of childbearing age. Perimenstrual pattern.
- Family history in 50%
- Response to prophylactic medication (e.g. venlafaxine) or a triptan

CSF pressure problems

Orthostatic symptoms

- CSF leak
  - Post-LP dizziness/nausea/headache
  - Post-epidural dizziness/hearing loss/tinnitus
  - Idiopathic
- No nystagmus

CSF-pressure problems

Normal pressure hydrocephalus

- Ataxic/Apraxic gait
- No vertigo, hearing problems or cerebellar signs
- Respond to spinal tap followed by shunt

Diagnostic Categories

- Neurological (i.e. posterior fossa)
- Medical
- Psychological (anxiety, malingering)
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"Medical Dizziness"

Much more prevalent than vestibular

- Cardiovascular (23-43%)
  - Orthostatic hypotension
  - Arrhythmia
- Infection (4-40%)
- Medication (7-12%)
- Hypoglycemia (4-5%)

Source: Madlon Kay (85), Herr et al (89)
Psychogenic Vertigo
Substantial

- Anxiety, hyperventilation, panic, Agoraphobia
- Somatization
- Malingering

Anxiety

- Long-duration dizziness
- Situational
- Responds to benzodiazepines
- Some have vestibular disorders too (Chicken-Egg problem)

Somatization

- Chronic dizziness
- Numerous bodily ailments
- One goes away to be replaced by another
- We don’t have a treatment for SD.
- Do not tell these people there is “nothing wrong”. Rather, try to minimize the health-care cost.

We have several good tests for Malingering

- Moving Platform
- Posturography – An algorithm for detecting inconsistency (Cevette score)


Undiagnosed Dizziness

- About 15% of all dizzy patients
- Our tests are not 100% sensitive
- We are not perfect either

Summary – non otologic dizziness

- Neurological (i.e. Migraine, posterior fossa)
- Medical (i.e. low blood pressure)
- Psychological (anxiety, malingering)
- Undiagnosed
More Details


More movies

www.dizziness-and-hearing.com