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Saturday, June 9, 2018
14:00 - 14:55  WS #139: The Acutely Dizzy Patient
15:05 - 16:00  WS #151: The Acutely Dizzy Patient (Repeated)

(Room 11)
The Acutely Dizzy Patient

Dr Karim Mahawish
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Rotorua Hospital
9th June 2018
Dizziness
- Scope

- Targeted history
- Tips on examining the otoneurological system
- Acute vestibular syndrome
- Miscellaneous conditions
- ?Syncope
Background

• One-third of <60 year olds have suffered a balance disorder
• Associated with falls & increased mortality
<table>
<thead>
<tr>
<th>Variable</th>
<th>Kroenke, et al 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patients</strong></td>
<td>100</td>
</tr>
<tr>
<td><strong>Average age</strong></td>
<td>46</td>
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<tr>
<td><strong>Cause, percent</strong></td>
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<tr>
<td>Vertigo</td>
<td>54</td>
</tr>
<tr>
<td>BPPV</td>
<td>16</td>
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<tr>
<td>Vestibular neuronitis</td>
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<tr>
<td>Other vestibular</td>
<td>10</td>
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<tr>
<td>Central</td>
<td>10</td>
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<tr>
<td>Migraine</td>
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<td>Nonspecific</td>
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<td>Psychiatric disorder</td>
<td>16</td>
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<td>Presyncope</td>
<td>6</td>
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<tr>
<td>Disequilibrium</td>
<td>2</td>
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<tr>
<td>Hyperventilation</td>
<td>1</td>
</tr>
<tr>
<td>Multicausal</td>
<td>13</td>
</tr>
<tr>
<td>Unknown</td>
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</tr>
</tbody>
</table>
Patient 1: Mr PT

- 56 year old
- Presents with 1 day history of dizziness

- What would you like to know?
Traditional method

- Vertigo – Vestibular causes
- Pre-syncope – Cardiovascular
- Disequilibrium – Neurological causes
- Non-specific – Psychiatric/metabolic/drug effects
Triage, Timing & Triggers

• Triage (Red flags):
  – Abnormal vital signs
  – Altered mental state
  – Sudden, severe, sustained head or neck pain
  – Hearing loss
  – Neurological symptoms: diplopia, focal symptoms
  – Cardiovascular symptoms: chest pain, dyspnoea, syncope
Timing

- Sudden onset / gradual
- Transient / episodic / continuous
- Duration
- Frequency
- Associated symptoms
Triggers

- Hanging up washing/looking at the sky/turning over in bed
- Changes in posture
- Relieving factors/avoidance behaviours
Dizziness is experienced when there is disconnect in the input-output pathway.
Physical Examination

**Cardiac system**
- Murmurs
- Orthostatic blood pressure changes
- (Note – not carotid bruit)

**Vestibular system**
- Neurological deficit
- Detection of nystagmus
- Positional testing (Dix-Hallpike)

**Neurological system**
- Assessment of gait
- Neurological deficit
Mr PT cont.

• Preceding RTI
• Sub-acute vertigo
• Now unsteady when walking and nauseous
• OE
  — Nystagmus
  — No focal neurological deficit
Examination
Labyrinth signals to central vestibular nuclei
Nystagmus

• Direction determined by the fast phase
• Slow phase – movement induced by vestibular pathology
• Fast phase – reflex resetting mechanism bringing eyes back to original position
• May be horizontal/vertical/torsional or a combination
Nystagmus - Examination

• Peripheral vestibular nystagmus
  – Dampened by visual fixation
  – Horizontal-rotatory

• End point nystagmus may be induced if gaze > 30 degrees off the midline
Peripheral Neuritis

- AKA – labyrinthitis, vestibular neuronitis, acute vestibulopathy
- Sub-acute vertigo, presumed viral aetiology with spontaneous nystagmus
  - The fast phase directed away from the affected ear
  - Postural instability
HiNTS Test –
Distinguishing peripheral from central vertigo

• For use in patients with hours to days of continuous, ongoing vertigo and spontaneous nystagmus

• 3 components
  – Head impulse test
  – Nystagmus
  – Test of Skew
Head impulse test

• To perform:
  – Hold onto head
  – Patient fixates on nose
  – Patient relaxed
  – Rotate head side to side slowly, then briskly to centre (30 degrees from midline)
  – Look for catch-up saccades → positive
Head Impulse Test
(Result - Abnormal)
Frenzel Goggles
Head impulse test
Normal HiNTS

• All of:
  – Unidirectional nystagmus
  – No vertical skew
  – Abnormal head impulse test

• Diagnosis – Vestibular Neuritis
Test of Skew
Direction Changing Nystagmus
Abnormal HiNTS

• Any of:
  – Direction changing nystagmus
  – Abnormal test of stew
  – Normal head impulse test

• If any present, 100% sensitivity & 96% specificity for central cause (e.g. stroke).
HiNTS Test

• Brain imaging may be normal in acute stroke
  – 29% false negative MRI in TIA/minor stroke
• HiNTS is more sensitive for the diagnosis of acute stroke than MRI in the first 48 hours
• One Caveat – may be falsely ‘normal’ in patients with AICA stroke (hearing loss)
Vestibular Neuritis

• Treatment:
  – 60mg for 5 days then reduce by 10mg/day
    (hastens recovery, but not long term prognosis)
• Stop symptomatic treatment ASAP (to avoid compromising long term adaption)
• Early mobilisation
• Vestibular rehabilitation
Prognosis

• Static oculomotor recovery starts within 3-4 hours (rebalancing of the vestibular nuclei)
• The majority will compensate within 6 weeks to 6 months
  – Recovery with recurrent episodes of decompensation
Compensation

• Causes of failure of compensation are:
  – Impairment of the other sensory inputs required for balance (vision/proprioception)
  – Use of vestibular suppressant drugs
  – Co-morbid systemic disorders
  – Psychological disorders
Patient 2: Mr RT

- 46 year old
- Sudden onset ataxia
- Brought into surgery – left facial droop noted by reception staff

- What next?
Indications for Admission

• Stroke symptoms
• High risk TIA
  – $\text{ABCD}_2 \geq 4$
  – On anticoagulants
  – AF/PAF
  – > 1 episode in last week
  – Known carotid stenosis
Time is brain

Each minute, the brain loses:

- 2 million neurones
- 14 billion synapses
- 12km of fibres

Saver JL. *Stroke* 2006; 263: 263-6
Effect of alteplase on good stroke outcome (mRS 0–1) by onset to needle

- 90 mins - NNT 4
- 180 mins - NNT 9
- 270 mins - NNT 14
Posterior circulation stroke

- Unilateral ataxia/weakness
- Bilateral signs
- Sensory signs (?dissociated)
- Diplopia
- Visual loss
- Dysphagia
- Truncal ataxia
Patient 3: Mr JW

• Attends afternoon clinic
• Wakes from sleep with sudden onset vertigo lasting < 1 minute

• What would you like to know?
Benign Paroxysmal Positional Vertigo (BPPV)

• Acute vertiginous episodes triggered by changes in the position of the head relative to gravity
• Caused by canalithiasis or cupulolithiasis
  – Posterior semi-circular canal (93%)
  – Horizontal canal (5%)
  – Anterior canal (2%)
BPPV

• Most common type of vertigo seen

• Causes:
  – Closed head injury
  – Vestibular neuritis (20% develop BPPV)
  – Ear Surgery
  – Prolonged bed rest
Key features

• Vertigo
  – Sudden, violent attacks triggered by head movement
  – Last <30 seconds
  – Occur in spells
  – Asymptomatic in between episodes
  – Avoidance behaviour
Dix-Hallpike

- Eyes open in centre gaze for 30 seconds
  - Upright – head turned 45 degrees
  - Rapidly recline the patient until the head extends over the edge of the bed
  - Right ear down
  - Left ear down
When should you be careful about trying this?

- Paget’s disease
- Neck pain
- Morbid obesity
- Severe RA
- Cervical instability/stenosis
- Confused/agitated
- Cervical radiculopathy
Why should you do it?

• Your patients will love you
• You can ‘fix’ their problem with no medication
• It can prevent a fall
• Your patients quality of life is enhanced
Interpretation

• Positive for ear turned down when nystagmus occurred
• If nystagmus observed, note:
  – Latency
  – Duration
  – Direction
  – Fatigability
Interpretation

• Latency of 3-5 seconds
• Upbeating rotatory vertigo 5-15 seconds
  – crescendo-decrescendo pattern
  – (central nystagmus lasts minutes)
• Right ear – nystagmus is upbeating & anticlockwise
• (Careful attention to iris markings improves observation of nystagmus)
Interpretation

• Fatigability
  – DH may be negative
  – Early morning tests are more reliable than late afternoon
Treatment – Posterior canal BPPV

- Canalith repositioning to float otoliths out of the posterior canal
  - Epley maneuver
  - Semont maneuver
  - Brandt-Daroff exercises
BPPV prognosis

- Initial success rates 80–95%
- Repeated manoeuvres may be necessary
- After treatment, BPPV could change from one canal variant to another
- 15% recurrence
- 5% of patients do not respond
  - Consider surgical interventions such as plugging the posterior canal
- Patients may experience vague disorientation for 2–3 days after treatment
### Diagnostic Matrix for Acute Vertigo

<table>
<thead>
<tr>
<th>HEARING LOSS</th>
<th>VERTIGO</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Episodic</td>
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<tr>
<td>Meniere’s disease</td>
<td>Persistent</td>
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<tr>
<td>BPPV</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>Persistent</td>
</tr>
<tr>
<td>Labyrinthitis</td>
<td></td>
</tr>
<tr>
<td>Vestibular neuritis</td>
<td></td>
</tr>
</tbody>
</table>
Meniere’s disease

• Repeated attacks of spontaneous vertigo (hours) with nausea and vomiting
• Unilateral hearing loss, tinnitus & aural fullness
• Occurs in clusters
• Otolithic crises of Tumarkin
Mrs GW

• 67 year old
• Falls with LOC < 30 seconds
  – No seizures/confusion
  – No incontinence
• Diffuse burning pain
• Diabetes for 8 years, recently started insulin
  – HbA1c 13% 3 months ago → 7.5% now
• Stocking sensory loss and absent ankle jerks
• What is the cause?
Treatment Induced Neuropathy of Diabetes (TIND)

• Iatrogenic small fibre neuropathy
  – Caused by abrupt glycaemic control in the setting of chronic hyperglycaemia
• Symptoms OH & diffuse neuropathic pain
• Prevention:
  – Reduce HbA1c by <2%
  – every 3 months
Orthostatic Hypotension

• Sustained reduction of BP
  – ≥20 mmHg systolic
  – ≥10 mmHg diastolic
  – Within 3 minutes of standing

• Increased risk of falls, syncope, fractures and death

• Prevalence
  – 5-18% of healthy elderly outpatients
Symptoms of cerebral hypoperfusion

- Lightheadedness
- Blurred/tunnel vision
- Muffled hearing
- Pallor
- Headache or coat hanger pain
Causes

• Medications
• PD/MSA
• Autonomic neuropathies:
  – Diabetes
  – Amyloid
  – Autoimmune
  – Idiopathic
Treatment

- Reduce/eliminate offending meds
- Non-pharmacological strategies
- Add medication to raise BP
Miscellaneous

• Superior canal dehiscence syndrome – vertigo/oscillopsia evoked by intense stimuli/sounds
• Mal de debarquement
• Basilar Migraine
• Carotid sinus hypersensitivity
• Metabolic disturbances
• Psychological dizziness
• Mechanical issues?
Drugs

• Vestibular/auditory damage
  – Aminoglycosides
  – Salicylates – reversible within 24 hours
  – Anticonvulsants – phenytoin/carbamazepine
  – Loop diuretics
  – Opiate medication
  – Chemotherapeutic agents

• Treatment
  – Discontinue drugs/vestibular rehabilitation
Progressive disequilibrium of aging

• Multi-system decline
  – Vestibular degeneration
  – Proprioceptive loss (degenerative joint disease)
  – Visual impairment
  – Cerebral & cerebellar degeneration
  \(\rightarrow\) gait instability & falls
Progressive disequilibrium of aging

Treatment

• Stop vestibular suppressants & sedatives
• Correct vision & hearing
• Physiotherapy:
  – Balance training
  – Walking aids
• Occupational therapy
  – Hand rails, lighting, fit loose carpets
Vestibular Rehabilitation

• CNS plasticity
Scenarios

1. 45 year old with subacute continuous vertigo
2. 78 year old with dizziness hanging up washing
3. 32 year old with recurrent episodes of fortification spectra, visual loss, diplopia & headache
Thank you – Resources

• Videos: http://www.neurology.org/content/70/22/2067/suppl/DC2

• BPPV guideline: http://www.entnet.org/content/clinical-practice-guideline-benign-paroxysmal-positional-vertigo-bppv