Migraine Associated Vertigo (MAV)

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Disclosure

Dr. Hain has no conflicts of interest relevant to the topic of this presentation.

Case (patient DA)

- 43 y.o. F, episodes of dizziness for 5 years
- Attacks begin with headache, nausea, dizziness, and severe ear pain.
- About 3/month, lasting 2-3 days.
- Severe motion intolerance

Case Study (patient DA)

- Tinnitus in both ears
- Denies hearing loss
- Physical exam normal
- Audiogram, 3 caloric tests, MRI of brain normal

MAV
Migraine Associated Vertigo

Headaches are common

- 90% lifetime prevalence
- 25% annually report recurrent episodes of severe headache
- 3-4% daily or near-daily headache
- Medications are used by 9% of US adults each week to treat headaches

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Migraine

- Most common headache, about 10-14% of entire population (Stewart, 1992)
- 20-30% of women of childbearing age have migraine
- Most self diagnosed “sinus” headaches are migraines (Eross et al, 2007)

Migraine is a “committee” diagnosis

- No specific tests – i.e. MRI’s or blood tests
- Diagnostic criteria were set by a committee (the IHS).
- Other “committee diagnoses” include
  - Meniere’s disease (AAO)
  - Chronic subjective vertigo

Migraine (IHS) criteria:
recurrent headaches separated by symptom-free intervals and accompanied by any three of the following:

- abdominal pain
- complete relief after sleep
- nausea or vomiting
- aura (visual, sensory, motor)
- hemicrania
- throbbing, pulsatile quality

Vestibular Migraine 2013 IHS criteria

a) At least 5 episodes fulfilling C and D
b) Past Migraine meeting IHS criteria
c) Episodic vestibular symptoms of moderate or severe intensity, lasting between 5 min and 72 hours
d) At 50% of episodes with at least one of following 3 migrainous features
   a) Headache: Unilateral, pulsating, moderate or severe, aggravation by activity
   b) Photophobia AND photophobia
   c) Visual aura.
IHS criteria for MAV are cumbersome

• We use simpler criteria:
  • Headaches or sensory amplification (photo or phonophobia or osmophobia)
  • Dizziness
  • Exclusion of alternative causes

Migraine Variants

• Common migraine (just headache – 90%)
• Classic migraine (with aura – 10%)

“Kaleidoscopic vision”

dots in middle of vision

seemed to enlarge + burst into colors

colors then blurred into a mass & then formed an arc
Migraine associated Vertigo

Even intermittent headache is not necessary to diagnose migraine

Migraine Variants

Acephalgic migraine: Aura without headache (a tough call).

- Usual story is transformation of headache with aura into aura alone.
- In older people, called “benign migrainous accompaniments of the elderly.
- About 1% of migraine population*

Migraine variants with vertigo but without headache (acephalgic migraines)

- Benign Positional Vertigo of Childhood (BPV)
- Cyclic vomiting syndrome – periodic vomiting for several days.
- Benign Recurrent vertigo (BRV).

Headache (HA) and dizziness don’t have to occur at same time in MAV either.

- Cutrer/Balogh (1992)
  - 5% (5/91): vertigo time-locked to HA
  - 25%: vertigo always independent of HA
- Johnson (1998): 91% (81/89) vertigo independent of HA


Migraine associated Vertigo

Migraine Variants

- Complicated migraine is accompanied by a neurological deficit.
- About 1% of migraine patients
- About 25% of patients with migraine have "small vessel disease" on MRI.
- Prevention is important

Prevalence of Migraine

(Stewart et al., 1994, did not align on menopause)

Migraine & Vertigo: High Prevalence

- Migraine:
  - 14% of U.S. population has Migraine†
  - 20-30% of women childbearing age
  - MAV – 1% with strict criteria* 3% with loose criteria.

Age distribution of MAV is older than Migraine in general

(From speakers adult “dizziness” practice 3:1 female: male)

Migraine in Women

- 3:1 ratio of women:men.
- Peak age for migraine is 40
- 10:1 increase in frequency of migraine around time of menses.
- Attributed to fluctuations in estrogen level. Can treat by eliminating fluctuations (BC pills – “seasonale”).
- 75% stop while pregnant
- Often flares for a few years near menopause

There is more migrainous vertigo than there is Meniere’s disease!


Hearing in MAV can look like Menieres

- Fluctuating low-tone SN hearing loss is common
- Both ears can fluctuate together

Migraine-Meniere’s overlap

- 50% of Menieres have migraine too.


Dr. Hain’s opinion is that migraine prophylaxis should be used prior to any invasive treatment for Meniere’s

Verapamil is usually a good pick (later coming in treatment).

Nystagmus in Migraine

- Spontaneous nystagmus was seen in 19% of 26 patients and nystagmus provoked by horizontal headshaking was seen in 35%.
- Nystagmus could be provoked with positional testing in 100% of symptomatic patients with fixation blocked. The positional nystagmus most commonly was sustained, of low velocity, and could be horizontal, vertical or torsional.
- Bithermal water caloric or rotary chair tests obtained during symptom-free intervals were normal in all patients.

Dr. Hain’s opinions about nystagmus in MAV

- Weak UBN or DBN is frequent
- DCPN
- Bitorsional -- specific

Bitorsion in Migraine
Migraine associated Vertigo

Migraine associated Vertigo

MAV symptoms may last for days (or even months)

- Cutrer and Baloh, 1992: Bimodal distribution
- 31% min-2 hrs
- 49% longer than 24 hours
- Chronic migraine – about 0.2%.


Migraine is often accompanied by strong motion sensitivity

10% normals have “motion sensitivity”

<table>
<thead>
<tr>
<th>Percent of migraine patients with motion sickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>49% Children</td>
</tr>
<tr>
<td>45% Children (60)</td>
</tr>
<tr>
<td>50.7% Unselected</td>
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</tbody>
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Migraines are “hard-wired”

- Sensitive brains, with thicker sensory cortex (Aurora, 2007)
- Structural changes in brain (Palm-Meinders, 2012)
- Strong genetic association (about 50%)


Diagnosis of MAV is based on 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 or a triptan

Missing brain tumors happens

- Risk of missing brain tumors in patients with headaches is small (because brain tumors are rare)
- Cost of missing them to providers is gigantic (because of litigation).
- Thus, when patients "ask for an MRI", the answer is usually Yes.

Differential Diagnosis

- Independent headache/dizziness
  - HA responds to treatment, dizziness persists – might have BPPV…
  - Dizziness -> headache
- Structural lesion (very rare)
  - No response to treatment
- Sleep apnea (AM headache)
- Psychogenic headache and dizziness
- Anti-phospholipid antibody syndrome
- Refractory headaches
- May need anticoagulation because of stroke risk

Chicago Dizziness and Hearing
A Missed Tumor

- 45 year old woman with dizziness, imbalance and headaches.
- Worse with bright light, loud noise, smell (i.e. she really has migraine)
- MRI showed a tumor.

Serendipitous brain tumor

- Cerebellar neurocytoma (bx)
- No change over 4 years
- Patient responded nicely to migraine medication.

I usually treat first – but if severe headaches do not respond …

- MRI or CT scan of brain/sinuses, possibly neck also. Makes most sense for non-triptan responders.
- Sed-Rate (for temporal arteritis)
- Sleep study if AM

Migraine Treatments

- Life style change (diet, sleep, BC pills)
- Analgesics and antiemetics
- Abortive agents (triptan family)
- Prophylactic agents
- Alternative agents (e.g. Butterbur, magnesium supplements)
- Last resorts (MAO inhibitors)

Two reviews


Most useful non-drug treatments

- Migraine diet (migraine patients LOVE diets)
- Withdraw birth control pills if possible
- Regular sleep patterns
- Withdraw vasodilators if possible (e.g. nitrates, some calcium channel blockers)
Dietary Factors in Migraine
- Monosodium glutamate (MSG)
- Cheese, especially blue cheese
- Alcohol (red wine)
- Chocolate (even dark)
- Caffeine (2 cups+)

Dietary Factors in Meniere’s very similar restrictions
- Furstenberg diet (1992)
  - Salt (includes MSG as in Migraine diet)
  - Sugar (e.g. chocolate too)
  - Alcohol (e.g. red wine too)
  - Caffeine (same as migraine)
  - Smoking


Analgesics and anti-emetics
- Acetaminophen, ASA
- NSAIDS
- Metoclopramide (Reglan)
- Phenergan
- APAP

Prophylaxis most important
- Unpredictable vertigo spells may prevent driving or be dangerous
- Migrainous vertigo rarely responds to vestibular suppressant medications

Prophylaxis of Migraine - 2013
80% of those who get headache relief also get vertigo relief (Bikhazi et al. 1997)
- Antidepressants
- Anticonvulsants
- Antihypertensives
  - L-channel Calcium channel blockers
  - Beta blockers
- Botox

Pregnancy Categories (Almost all are Pregnancy C or D)
- A: Proven safe
- B: Probably safe
- C: Use caution
- D: Dangerous
- X: Don’t use
## Venlafaxine (Effexor XL)
- Very effective – 50 to 80% (Bulut, 2004)
- Start with 1/3 of 37.5 XL, increase to 37.5
- Side effects are minor:
  - A little activation – like a cup of coffee
  - Minor sexual side effects
  - No effect on weight
- Pregnancy category C
- Warn patient not to “cold turkey” for larger doses (head-zaps)

## Tricyclic antidepressants 75% effective
- Very cheap and very effective
- Amitriptyline, Nortriptyline
- Side effects are major:
  - Fatigue, weight gain, hair loss
  - Antihistamine AND anticholinergic (vest. Suppressor)
  - Not a good drug for older people
- Pregnancy category D
- Start with 10 mg, increase weekly to 25-50

## SSRI antidepressants ?? effective ??
- Fluoxetine, Celexa, Paroxetine
- SSRI’s don’t work for migraine associated vertigo but can certainly use for depression.
- Some SSRI’s cause tinnitus.
- All SSRI’s cause nausea, at least on startup.

## L-channel Calcium Channel Blockers
- Verapamil 120-240 SR.
- 1 mg/pound initial dose
- Takes 2 weeks to work
- No sedation – great drug for this reason
- Hypotension rarely a problem
- Constipation main side effect – increase dose if not constipated after 2 weeks.

## Other calcium channel blockers
- flunarizine (Sibelium) 5-10 mg.
- Not FDA approved, but VERY well studied – 532 papers in Pubmed.
- Has a 30 day half-life and also serious side effects (dopamine blocker).
- Most other calcium channel blockers just don’t work or make headache worse due to vasodilation.

## Beta Blockers
- Any beta blocker works – so pick an inexpensive one in a good pregnancy category. $20/month
- Propranolol 60 LA (category C)
- Metoprolol 50 XL (category C)
- Bisoprolol (Bystolic) Low side effect
- Side effects
  - Fatigue, Slow pulse, Hypotension, sexual
- 1 month to work
Migraine associated Vertigo

Anticonvulsants (Don’t affect BP, cognitive issues)

- Gabapentin (Neurontin) – category C
- Sodium Valproate (Depakote) – category D
- Topiramate (Topamax) – category D
- 10% cleft palate
- Levetiracetam (Keppra) – category C
- Lamictal (Lamotrigine) – category C


Gabapentin (Neurontin)

- Dose: 100 tid to 800 tid
- Extremely safe
- Not very effective – adjunctive agent
- Also suppresses vertigo and nystagmus
- Also useful for pain in general (arthritis)
- Pregnancy category C


Anticonvulsants: Topiramate (Topamax)

- Dose: 25 mg to 150 mg, Start with 25, increase weekly
- 50% response
- Associated with weight loss!
- Moderate doses – speech disturbance
- “Dopamax” – can’t talk or think
- Tingling in hands and feet too
- Pregnancy category D


Botox for Migraine

“you mean my insurance will pay for this?”

- Strong evidence for a small effect in many (roughly 10%). Large ‘n’.
- Trials funded by Botox manufacturer, Allergan
- Difficult to understand how paralyzing scalp works.
- Very expensive! About $1000 JUST drug. q3m


Abortive medications

- Triptans (sumatriptan, etc.).
- Useful for diagnosis
- Generic – sumatriptan
- Powerful – Relpax/Maxalt
- Long acting – frovatriptan (36 hour)


Alternative Medications for Migraine

- Magnesium 500 mg/day (two “cal-mag”)
- Petadolex 50 mg TID (? Miracle drug ?)


Migraine associated Vertigo

Medications of last resort

- MAO inhibitors (e.g. tranylcypromine – Parnate; phenelzine – Nardil)
- Narcotics

These medications have substantial potential for toxicity.

Migraines don’t respond to:

- Physical therapy, including the Epley maneuver
- Diuretics (i.e. HCTZ-triamterine)
- Meclizine or scopolamine patches

Returning to our case

- Patient tried verapamil for 1 month. No response.
- Patient then tried on propranolol 60 LA. Headaches and dizziness greatly reduced.
- Plan was to continue on propranolol, with attempts to D/C every 2 years till post menopause.

Summary

- Migraine associated vertigo is very common, more so than Meniere's disease
- Meniere’s and Migraine overlap substantially
- Diagnosis is via clinical judgment, combined with judicious tests to exclude dangerous alternatives.
- Drug treatment is generally very successful