Migraine Associated Vertigo
(Vestibular Migraine)

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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

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 (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 (Neuhauser) strict criteria:

- Migraine meeting IHS criteria (this is hard part)
- Episodic vestibular symptoms
- At least one of following during 2 attacks
  - Migraine headache
  - Photophobia
  - Phonophobia
  - Visual or other aura
- Exclusion of other causes

Our Take -

- IHS criteria for VM are too cumbersome – We prefer simpler criteria:
  - Headaches or sensory amplification (photo or phonophobia)
  - Dizziness
  - Exclusion of alternative causes

Migraine Variants

- Common migraine (just headache – 90%)
- Classic migraine (with aura – 10%)
Migraine Variants

- Acephalgic migraine: Aura without headache (a tough call).
- Usual story is transformation of headache with aura into aura alone.
- About 1% of migraine population*

*Kayat/Hood, 1984; Selby/Lance, 1960
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 here

(Evans and Olsen, 2003; De Benedictis and Lorenzetti, 1995).

Prevalence of Migraine

- Women
- Men

Second migraine peak at Menopause

- 57% of patients in a Menopause clinic, 29% of women during 3 months prior to visit.
- 44% “premenopausal” (Wang, 2003)
- Vestibular migraine patients age peaks around menopause.

Migraine in Women

- 3:1 ratio of women:men.
- Peak age is 30-45.
- 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

Migraine & Vertigo: Prevalence

- Migraine:
  - 10% of U.S. pop†
  - 20-30% of women childbearing age
- Vertigo: 35% of migraine population.*
- Migraine + vertigo (loose criteria):
  - ~ 3.5% of U.S. pop.
  - ~ 10% of women of childbearing age
- Strict criteria
  - 0.89% of German population (Neuhauser, 2006)

† Lipton and Stewart 1993; Stewart et al. 1994

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
- 50% of Menieres have migraine too.


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

Exception: Migraine does NOT cause drop attacks.

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

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


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**Migraine without headache**

- Acephalgic migraine: Aura without headache, or sensory exaggerations alone.
- Usual story is transformation of headache with aura into aura alone.
- About 1% of migraine population*


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**Even intermittent headache is not necessary to diagnose migraine**
VM 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>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>49% Children</td>
<td>Bille (1962)</td>
</tr>
<tr>
<td>45% Children (60)</td>
<td>Barabas et al (1983)</td>
</tr>
<tr>
<td>50.7% Unselected</td>
<td>Kayan and Hood (1984)</td>
</tr>
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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 – Committee diagnosis

- 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

Differential Diagnosis

- Independent headache/dizziness
  - HA responds to treatment, dizziness persists – might have BPPV…
- 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

Genetics – is migraine one disorder?

- Since 2010, three large genome-wide association studies (GWAS) have identified six genetic variants associated with migraine. Each variant has only a modest contribution to the overall genetic risk of migraine, suggesting a marked genetic heterogeneity.


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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 (especially for AM headaches)

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)

Most useful non-drug treatments

- Migraine diet (these patients LOVE diets)
- Magnesium supplements (500 mg/day)
- 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

Analgesics and anti-emetics

- Acetaminophen, ASA
- NSAIDS
- Metoclopramide (Reglan)
- Phenergan

Prophylaxis is most important

- Unpredictable vertigo spells may be dangerous
- Migraineous vertigo rarely responds to vestibular suppressant medications
- Migraine rarely responds to physical therapy.
Prophylaxis of Migraine - 2015
80% of those who get headache relief also get vertigo relief (Bikhazi et al, 1997)

- Antidepressants
- Anticonvulsants
- L-channel Calcium channel blockers
- Beta blockers
- Botox


Effectiveness of Treatments in Headache with Dizziness

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 37.5 XL, 1/3 capsule. Increase to full 37.5, 1/3 more every week
- 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 about “cold turkey” for larger doses


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 120-240SR.
- 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.
- Cheap ($19/month). Pregnancy category C, interacts with statins (prolongs tc)

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 common side effects (dopamine blocker, weight gain, cardiac).
- 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

Anticonvulsants
(Don’t affect BP, cognitive issues)

- Gabapentin (Neurontin) – category C
- Sodium Valproate (Depakote) – category D
- Topirimate (Topamax) – category D
  - 10% cleft palate
  - “dopamax” – can’t talk or think
- Levetiracetam(Keppra)
- Lamictal

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
- 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

ACE inhibitors not effective for migraine

- Lisinopril (29-34% response)
- Candesartin (32-48% response)

Abortive medications

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

Alternative Medications

- Magnesium 500 mg/day (two “cal-mag”)
- Petadolex 50 mg TID – author has had no good responders to this.

Medications of last resort

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

These medications have substantial potential for toxicity and are generally administered by headache neurologists or pain clinics.
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
- Diagnosis is via clinical judgment, combined with judicious tests to exclude dangerous alternatives.
- Drug treatment is generally very successful but may require several months of trial/error

More reading