Headache Diagnosis and Management

RYAN M SMITH DO
Disclosure

- Consultant to TEVA
  - One time...
Objectives

- Be able to diagnose common headache types based on ICHD-3 criteria
- Distinguish between primary and secondary headaches
- Be able to confidently use tried and true migraine medications
Headaches

- ~86% of people in the USA will experience a headache this year.
  - Most common headache type is tension type headache (TTH).
  - Most people will not seek medical care for their headaches.
- Migraine is experienced by 11% of the population.

Migraine is the most common disorder seen by Neurologists

- Up to 5% of people in the world have chronic migraine
- 30 million Americans with migraine
- 300 thousand with MS in comparison
- Most costly neurologic disorder in Europe.

Top 10 Disabling Medical Conditions According to a calculated “Years Lived with Disability” (YLD) Global Burden of Disease Study (Vos et al., Lancet 2013)

1. Low back pain
2. Major depressive disorder
3. Iron-deficiency anemia
4. Neck pain
5. COPD
6. Other musculoskeletal disorders
7. Anxiety disorders
8. **Migraine**
9. Diabetes
10. Falls

*Migraine rated #8 for top disabling medical conditions (years lived with disability)*
World Health Organization estimates that a day of migraine is the equivalent of being quadriplegic

- *N Engl J Med, Vol. 346, No. 4 - January 24, 2002*
Funding

- NIH spends ~13 million on headache research
- Based on funding for diseases of similar prevalence and disability migraine research should be > 100 million.

Migraine: More than just pain

- Genetic brain disease with spectrum of episodic flare ups to chronic disease with many additional manifestations other than head pain:
  - Medical
    - Epilepsy, HTN, mitral valve prolapse, Raynaud’s phenomenon, stroke, patent foramen ovale
  - Psychiatric
    - Depression, bipolar disorder, functional neurological disorders, anxiety, panic disorder, personality disorders

Migraine:
More than just pain

- Disease of sensory processing and integration:
  - light, sound, smell sensitivity
  - dizziness (persistent postural perceptive dizziness)
  - blurry vision (visual snow)
  - exertional worsening of pain
  - cognitive slowing

Sensory integration?

- Migraineurs on fMRI demonstrate more connections between auditory and visual cortices, anterior insula and brainstem regions.

Diagnosing Headaches

- International Criteria for Headache Diagnosis (ICHD)
  - Multiple iterations
  - Most recent in 2013
    - ICHD-3 beta will become final in 2016
- 180 pages
Tension Type Headache (TTH)

- Most common headache disorder
- Rarely seen as physicians
  - Most don’t need treatment unless chronic
  - Mild to moderate pain typically pressure or tightness
- More important for what it is **NOT**
  - Can only have photo or phono- **NOT BOTH**
  - No nausea
  - No exertional worsening of pain
  - No aura
  - Not due to muscle “contraction”
Treatment

- Most common phenotype of post-traumatic headache
- TCA’s mainstay of treatment if chronic
  - Prefer amitriptyline
  - Gabapentin if intolerant
  - No evidence muscle relaxers help
  - NSAIDs typically very helpful
Migraine

• More important for positive features than negative features
• ICHD-3 beta criteria can be confusing

• **A Good rule of thumb:**
• Severe headache
• Light, sound, smell sensitivity
• Nausea and exertional worsening
• Presence of Aura
Aura
“Complicated” Migraine

- Not an ICHD diagnosis
- Aura is not “complicated or complex”
  - Brainstem
  - Motor
  - Visual
  - Sensory
  - Speech
- Cortical **spreading** depression
  - 2-3 mm/min
  - No impairment with autoregulation or vasculature
  - Presents different than stroke
Key question to migraine diagnosis

• “Do you have severe headaches where you like to lie down in a dark and quiet place and not move?”

• If answer is yes then most likely migraine!
Primary vs secondary headache

- Fellowship experience
- **Reassurance**
- A 1995 study found 0.1% of brain tumors actually accounted for primary origin of headache.
- In 2005, of 1876 patients with MRI OR CT with normal neurologic examinations and non acute headache only 1% had a “clinically relevant finding”.
- Most common phenotype of “brain tumor” headache is actually tension type headache
Power of the neurologic exam

- Air force recruits mean age 20.5
  - N=2500 all had “normal neurologic examinations”
  - 6.5 % abnormal scans
    - Arachnoid cyst 1.7%
    - Cavernoma/AVM 0.5%
    - Mass- 0.4% -lipoma and hypophyseal adenoma
    - Chiari type I 1.7 %
    - Rest were nml, or pineal cyst
• Recent significant change in the pattern, frequency or severity of headaches
• Progressive worsening of headache despite appropriate therapy
• Focal neurologic signs or symptoms
• Onset of headache with exertion, cough, or sexual activity
• Orbital bruit
• Onset of headache after age 40 years
Brain tumor signs

- TTH most common phenotype
- Rare is the supine worsening and improvement with standing
- Abnormal exam
- Brain tumor headaches are progressive and do not respond to prevention therapy

One other reason to image...
Medication overuse headache (MOH)

Large part of my job

*First do no harm*
MOH is REAL

- Does not occur in patients without prior headache
- Central sensitization due to downregulation of 5Ht 1B and D receptors
- Chronic narcotic usage increases CGRP, and substance P in MOH patients
  - Also inhibits descending anti-nociceptive input from rostral ventral medulla
  - Endocanniboids decreased in MOH patients and return to normal after withdrawal of offending medicine
  - Several rat models
  - One study found polymorphisms in the COX-2 gene were more susceptible to MOH
- Sometimes difficult for patients and clinicians to accept

Pathophysiology and management of transformed migraine and medication overuse headache.
Medication Overuse Headache

- Overuse of abortive agents can prevent efficacy of preventives

- Treatment
  - Abrupt withdrawal (except opiates and butalbital) vs slow withdrawal
  - To bridge or not to bridge
    - Prednisone, prevention therapy, injections, educate patient
    - Infusion
  - Rarely admission is necessary

Mathew NT, Kurman R, Perez F. Drug induced refractory headache--clinical features and management. Headache. 1990;30(10):634
Behavioral component

- Migraineurs seem to be more compulsive in drug seeking and gravitate towards drug seeking even with negative consequences.
  - Often still take offending medications despite receiving no benefit from them.
  - I see this frequently.
  - Substance abuse more common in MOH patients than those without MOH

- Relapse rate after 1 year around 40% overall—much higher with opiates.

---


Causal drugs

1. Butalbital containing compounds (any use-5 days)
   1. banned in Europe
2. Acetaminophen: 10-14 days
3. Opioids (any use)
4. ASA: 10-14 days
5. Triptans: 10-14 days
6. Ergots (e.g. DHE): 10-14 days
7. NSAIDs other than ASA ~14 days

Caveats to the numbers

- Very low incidence of MOH if triptans, NSAIDs used less than 9 days per month and complete avoidance of butalbital and opiates
  - Reason insurances won't pay for more than 9 triptans
  - Some people can tolerate more days than others and some less
  - Importance of headache calendar
  - My standard is two days per week of triptans and 14 days of NSAIDs
    - Patients don’t like to hear this…reason I stress prevention…
I never use Fioricet, opiates or ergots except DHE injection

I. Garza story

Hypnic headache one exception

Excedrin very effective
Very important to prevent MOH

- **Can prevent prophylaxis from working**
  - Not everyone converts back to episodic despite withdrawal of offending medicine.
    - Up to 30% with discontinuation alone do not respond
    - 15% with prophylaxis and discontinuation
  - Case reports of some patients taking 6 months before returning to episodic headache
    - Long time to have a headache everyday...


Treatment of MOH

- Abrupt vs gradual taper
  - *never abruptly stop butalbital or opiates if taken at high doses or everyday
  - Can use phenobarbital if needed to wean off of butalbital
    - 30 mg of PHB per 100 mg of butalbital
    - Taper PHB by 30 mg every 3 days until off
  - Some patients may need to be admitted (rare)
- For opiates can use clonidine patch 0.1 mg (once weekly) a couple weeks until off.
Bridge therapy

- Used for short term while prevention is beginning and patient is being weaned off of medications
  - Prednisone-2 studies suggest efficacy; 1 study suggests no benefit (doses vary 60-100mg x 5 days)
  - Peripheral nerve blocks
  - Naproxen alone for those withdrawing from Excedrin or ergotamines suggests efficacy
    - Adding tizanidine may make naproxen more effective
- Inpatient strategies
  - DHE Raskin protocol
  - Continuous DHE
  - IV Depakote
  - IV Compazine
  - IV lidocaine
Treatment of MOH
3 strategies

i. Limit medicine only (e.g. 9 days of triptans or 14 days of NSAID)
   i. Efficacy ~21%

ii. Discontinue medication entirely for 2-3 months
   i. Efficacy ~58%

iii. Discontinue medication and add prophylaxis
   i. Efficacy ~85%
   i. Of those already on prophylaxis changing prophylaxis may increase likelihood of response as well.
Tips to success

- Make sure patient is aware of high chance of worsening headaches
- Involve family in helping patient abstain
- Have patient make choice on which method they want to try to get through this
- Educate that this is the only way forward for headache relief
Tips to success

- Make sure they are aware there ARE things they can take to help them through this period and they aren’t being abandoned
  - Close follow-up through withdrawal period
- Realize that relapses are common ~1/2 will relapse
- Consider admission if patient unable to come off medicine and continues to relapse
Migraine Treatment

• Many medications used for migraine treatment
• Most not FDA approved
• Many have not been rigorously studied in controlled trials
• Stick with the tried and true medications first
Tricks to prevention treatment

- Patience - 3 months usually needed
- Warn of side effects in advance
- Titrate slowly
- Stick to tried and true medicines first
- Unusual side effects - warning sign
- Ensure patient is not over using abortive medicines
Migraine prevention

“Which one do I pick?”
- Discuss multiple and their side effects and allow discussion
- Genetic research
- Everyone has their pick and method of titration—anecdotally based
Topiramate

- Multiple mechanisms of action (glutamate antagonist, sodium channel antagonist etc)
- Often first line therapy
- Fellowship experience with efficacy >150 mg
- Side effects
  - Weight loss
  - Paresthesias
  - Cognitive side effects
  - >200 mg interacts with OCP
  - Nephrolithiasis
- Category D


**amitriptyline**

- Multiple mechanisms of action-side effects typically anticholinergic
- Up to 100 mg-(25 mg/week titration)
  - If go higher then EKG (QT prolongation)
  - In elderly 65+ consider max dose at 50 mg (10 mg/week titration)
- Helps with sleep (often temporary)
- Dry mouth, weight gain (appetite related), constipation, sun burn easier
- Best medicine for featureless headaches-think CTTH
- Excellent for post traumatic headache, also good for neuropathic pain and somatic pain

gabapentin

- Modulates c-fiber activity
- Very few side effects
  - No metabolism thus TID dosing
  - Max dose 3600 mg (if normal GFR)
  - Few drug interactions
- Most require 600 mg TID or higher
- Dose lower and slower in elderly
- Useful for neuralgiform pain

Works on multiple types of beta receptors

Side effects
- Orthostatic intolerance, dizziness, bradycardia, worsening of asthma
- Weight gain, sexual side effects, debatable worsening of depression
- Exercise intolerance

60 mg LA and increase weekly-debate on max 160 – 240 mg.
- Check HR and BP after 120 mg
- Personal experience

May be just as effective as Topamax, and better than Depakote
- Cheap!

Abortive Medications

- Triptans
  - Mainstay of migraine treatment
    - 5HT1B, D, F agonists
  - Not pain medication
    - Underlying mechanism involves shutting down migraine genesis
  - Cutaneous allodynia – point of no return
Triptans

- SE-dizziness, paresthesias, warm sensation, chest discomfort/tightness
- Vigorous debate as to intracranial vasoconstriction and cardiac vasospasm
- FDA warning in hemiplegic migraine, “basilar” migraine, CAD, stroke, uncontrolled HTN
- Based on “vascular” theory of migraine
Triptans

- Multiple types of triptans
  - SQ-sumatriptan: most effective; least tolerated effective within 15 minutes
  - PO-eletriptan likely most effective, not generic yet; naratriptan most tolerated; prefer rizatriptan due to efficacy and tolerability
  - NS-sumatriptan, zolmitriptan
    - Less bioavailability than PO, not more effective than PO; does not avoid GI absorption
  - MLT rizatriptan: less bioavailability than PO; tastes terrible; does not avoid GI absorption
  - Transdermal sumatriptan
    - 2nd to SQ in terms of onset of action and bioavailability; avoids GI absorption; no head to head comparison

Injections

- Occipital nerve blocks and supraorbital blocks can be very helpful
- Only 1 RC study with use as preventive with good results
- Helpful to educate on duration of benefit
  - Minutes, hours, days, weeks, rarely months
- Used more often for rescue for status migrainosus or as treatment in pregnant women

Onabotulinum A

- Some consider the “most effective” treatment
- Virtually no drug interactions
- Administer every 12 weeks
- 25 -30 injections per session
- Side effects rare
  - Neck weakness
  - Ptosis
  - Neck pain
- Only approved for chronic migraine
Supraorbital transcutaneous stimulation
Sphenopalatine ganglion block

- Both sensory and autonomic input
  - Can abort cluster headache
- No needle
- Cather based approach
  - Sphenocath©
- Target for neuromodulation
- SE
  - Numb throat
  - Discomfort from catheter
- Case series and anecdotal evidence

Refractory chronic migraine

- Pain rehab program
  - Mayo Clinic experience
- Neuromodulation
  - Occipital
    - 3 negative RC trials; 1 +/- trial
    - Anecdotal evidence mainly drives procedure
    - Insurance typically won’t pay
- Sphenopalatine
  - Limited data, but promising!
- Supraorbital
  - Even less limited data-not enough to recommend
Cluster Headache

- Very different than migraine
- Side locked headache—typically periorbital
- Autonomic dysfunction unilaterally
  - Rhinorrhea, lacrimation, ptosis, miosis, conjunctival injection
- Could be worst pain a human can endure
- Patients are RESTLESS where migraneurs want to lie still
- Only lasts 30 to 90 minutes
  - Occurs in clusters of multiple a day for several weeks to months
  - Chronic cluster is rare—thank goodness!
- High suicide rate
Treatment

- Consider headache specialist referral
- Mainstay is prednisone bridging while titrating verapamil
  - Some require up to 1 gm daily of verapamil
  - Lithium, bromocriptine, topiramate and valproate
- Rescue therapy
  - Oxygen 15L/min with non-rebreather-usually works within 15 minutes
  - Sub-Q sumatriptan 6 mg works with 5-10 minutes
- Several satisfactory trials for neuromodulation including deep brain stimulation for chronic refractory cluster headache
Summary

- Better understanding of headache types and treatments
- When to image and what red flags to look for
- Avoid over-use of abortive medications
Questions?