Headache

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Epidemiology

• One of most common complaints in primary care
  – 90% of US population
  – 50% at least one “severe”
  – 25% recurrent disabling attacks
  – 5% chronic daily headache
Common Primary Headache Syndromes

- Tension Type
- Migraine
- Cluster (and other TAC complex)
Tension Type Headache

• Most common 40-80% but account for <5% of visits to primary care

• Definition (episodic)
  – At least 10 episodes, <1 day per month on average
  – Duration 30 mins-7 days
  – At least 2 of: bilateral location, mild to moderate, pressing/tightening (non-pulsating) quality, not aggravated by routine physical activity
  – No nausea/vomiting
  – Photo or phonophobia but not both
Tension Type Headache

• Frequent 1-14 days/mo
• Chronic >15 days/mo
  – Probably more central pain mechanisms involved
  – Sensitization of pain pathways in the central nervous system due to prolonged nociceptive stimuli from pericranial myofascial tissues
  – May have genetic factors
Tension Type Headache

• Etiology is not actually thought to be muscle contraction
  – Peripheral activation or sensitization of myofascial nociceptors
  – Tenderness to palpation of pericranial myofascial
• When more severe/disabling—part of migraine spectrum or “mixed headache disorder”
• Chronic form may develop (medication overuse)
Tension Type Headache

• **Treatment**
  – Usually respond to OTCs
    • Acetaminophen, ASA/caffeine, NSAIDs
    • Avoid opioids, butalbital containing compounds, muscle relaxants, etc.
    • If do not respond, consider migraine
  – **Nonpharmacologic**
    • PT, massage, biofeedback, etc
  – **Chronic**
    • Consider depression, medication overuse, or secondary HA
    • Tricyclic antidepressants, SSRIs/SNRIs
    • Limited studies of gabapentin, topiramate
Migraine

• Prodrome/aura/headache/resolution/postdrome
• Without aura or “common” (80%)
  – At least 5 attacks
  – Duration 4-72 hours (without treatment)
  – At least 2 of: unilateral, pulsating quality, mod to severe, aggravated by/avoidance of routine physical activity
  – During HA, at least 1 of: nausea or vomiting, photo, phonophobia

  – Olophobia, other GI symptoms, mood disruption, cognitive dysfunction, sleepiness, sinus symptoms, trigeminal autonomic symptoms
Migraine

• With aura (20%)
  – Same features as migraine without aura
  – Visual symptoms—positive or negative
  – Sensory symptoms—positive or negative
  – Dysphasic speech disturbance
  – Typically develop over at least 5 mins and last less than 1 hour; headache, if present, within 1 hour
  – Cognitive or visuospatial difficulties, rarely motor weakness
Which type of aura symptoms do you experience?

- Flashes or flickering light (48% | 211 Votes)
- Blurry vision (40% | 176 Votes)
- Dizziness (38% | 164 Votes)
- Confusion (35% | 152 Votes)
- Aphasia (difficulty speaking) (33% | 143 Votes)
- Parasthesia (prickling/numbness) (30% | 129 Votes)
- Total/partial loss of vision (28% | 122 Votes)
- Other (27% | 118 Votes)
- Vertigo (whirling/spinning) (26% | 113 Votes)
- Decrease in/loss of hearing (23% | 101 Votes)
- Allodynia (sensitivity to touch) (16% | 71 Votes)

1,500 total votes. Thanks for sharing.
Migraine Epidemiology

- 2\textsuperscript{nd} most common cause of headache
- Most common HA visit to primary care
- Lifetime prevalence >20%
- Genetic component (polygeneic)
- Affected by gender and age
  - 90\% 1\textsuperscript{st} attack by age 40
Migraine Epidemiology

[Graph showing age distribution of migraine incidence by gender (Males and Females)]

- Males:
  - 12 to 17: 4.0%
  - 18 to 29: 5.0%
  - 30 to 39: 7.4%
  - 40 to 49: 6.5%
  - 50 to 59: 5.0%
  - 60+: 1.6%

- Females:
  - 12 to 17: 6.4%
  - 18 to 29: 17.3%
  - 30 to 39: 24.4%
  - 40 to 49: 22.2%
  - 50 to 59: 16.0%
  - 60+: 5.0%
Migraine Pathophysiology

• Old theory—vascular
  – Hyperemia and ischemia
  – Treatment with vasoconstrictors

• New theory—primary braintem dysfunction/hyperexcitable cortex
  – Motion sickness, light sensitivity, “brain freeze”
  – Activation and sensitization of central trigeminal system
  – Sensitization of PN perivascular nerve terminals
  – Neuropeptide release neurogenic inflammation of meningeal vessels (substance P, CRGP)
  – Self sustaining feedback loop
Treatment of Migraine

• Prevention
  – Identify and avoid triggers
    • Environmental
    • Food/dietary—restrictive diet unhelpful
  – Migraine diary

• Non-pharmacologic (Grade A in AAN)
  – Stress management and relaxation techniques, biofeedback, CBT
  – Maintaining regular schedule
Treatment of Migraine

• Acute attacks (abortive therapy)—take early!
  – Simple analgesics and NSAIDs
  – Caffeine containing compounds
  – Triptans +/- NSAIDs
  – Isomethptene compounds (Midrin)
  – DHE nasal spray
  – Antiemetics
    – Periactin (cyproheptadine), Baclofen, Thorazine, Indocin
  – Steroid burst
  – Opioids/Butalbital—rarely (high risk for rebound)
    • “Rescue” meds
Treatment of Migraine

– Triptans (9 currently)—Take early!
  • Oral, rapidly disintegrating wafer, SQ injection or nasal spray; transdermal released soon
  • Serotonin 1b/1d agonists
  • inhibit the release of vasoactive peptides, promote vasoconstriction, and block pain pathways in the brainstem

– Clinical trials
  • Transcranial magnetic stimulation/TC supraorbital nerve stimulation
  • CRGP antagonists (hepatotoxicity); CRGP antibodies
  • Lasmiditan-serotonin agonists
Treatment of Migraine—Refractory Acute

• Phase I—treat acute head pain
  – IV NS (1-2L); migraine cocktail (ketorolac/Benadryl/phenothiazone)
  – IV DHE 1 mg IV push over 3-5 mins (0.25 mg test dose)

• Phase II—Decrease cortical irritability/central sensitization
  – Depacon (IV valproic acid) 1000mg
  – Dexamethasone or methylprednisolone

• Phase III—additional Rx to decrease central sensitization
  – Mg sulfate 1 gm IV push over 3-5 mins
  – Thorazine (chlorpromazine) 12.5-25 mg IV

Wait 30 mins between phases
Treatment of Migraine

• Prophylactic therapy
  – Recurring migraines significantly interfering with daily life
  – Adverse effects, complications, failure or overuse of acute therapies
  – Frequent protracted or increasing attacks (>3/mo)
  – Cost of acute therapies
  – Patient preference
Treatment of Migraine

New study shows early intervention of prevention/adequate treatment of episodic migraine prevents progression to chronic migraine
Treatment of Migraine

• Prophylactic therapy
  – Antihypertensives
    • B blockers, Ca channel blockers
  – Antidepressants
    • TCAs, SNRIs, duloxetine (often not SSRIs)
  – Anticonvulsants
    • Valproic acid, topiramate, zonisamide, gabapentin, lamotrigine
  – Botox (chronic refractory migraine >15 days/mo)
  – Herbal/naturopathic
    • Magnesium glycinate, butterbur, feverfew, riboflavin

– Menstrual migraine—use NSAIDs, triptans on days of expected migraines

– FOLIC ACID in women of childbearing age
Cluster Headache

• One of the Trigeminal Autonomic Cephalgias
  – Cluster headache
  – Episodic paroxysmal hemicrania
  – Chronic paroxysmal hemicrania
  – Hemicrania continua
  – SUNCT/SUNA syndrome
  – Stabbing headache
  – Trigeminal neuralgia?

NB—migraine can also have autonomic features
# Trigeminal Autonomic Cephalgias

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cluster</th>
<th>CPH</th>
<th>EPH</th>
<th>SUNCT</th>
<th>Stabbing</th>
<th>Trigeminal Neuralgia</th>
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<tbody>
<tr>
<td>Gender M:F</td>
<td>4:1</td>
<td>1:3</td>
<td>1:1</td>
<td>2-3:1</td>
<td>F&gt;M</td>
<td>F&gt;M</td>
</tr>
<tr>
<td>Duration 15-180 mins</td>
<td>2-30 mins</td>
<td>1-30 mins</td>
<td>5-240 secs</td>
<td>&lt;1 sec</td>
<td>&lt;1 sec</td>
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</tr>
<tr>
<td>Frequency 1-8/day</td>
<td>1-40/day</td>
<td>3-30/day</td>
<td>1/day-30/hour</td>
<td>Few-many</td>
<td>Few-many</td>
<td></td>
</tr>
<tr>
<td>Autonomic features</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ETOH precipitate</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Indocin effect +/-</td>
<td>+/-</td>
<td>+</td>
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</tbody>
</table>
Cluster Headache

- Multiple attacks of severe unilateral, orbital/supraorbital/temporal pain lasting 15-180 mins if untreated
- At least one of:
  - Unilateral conjunctival injection, tearing or both
  - Ipsilateral nasal congestion, rhinorrhea or both
  - Ipsilateral eyelid edema
  - Ipsilateral forehead and facial swelling
  - Ipsilateral miosis, ptosis or both
  - A sense of restlessness or agitation
- Attack frequency 1 every other day to 8/day
Cluster Headache

- Cluster over time
- Circadian periodicity
- ?Posterior hypothalamus
- Onset is more rapid than migraine
- Often nocturnal
- Triggers—ETOH, NTG, Viagra
- PACING, RESTLESS!
Cluster Headache Treatment

• Abortive treatment
  – Inhaled 100% O2, 10-12 L/min
    • 70% effective, especially when attack at maximum
  – Injectable sumatriptan 6mg
    • 90% effective for 90% of attacks
    • Efficacy in 15 mins in 50-75%
  – Intranasal sumatriptan and zolmitriptan
  – Intranasal (or injectable) DHE
  – Intranasal lidocaine
Cluster Headache Treatment

• Short Term prevention
  – Corticosteroid burst, ergots, methysergide

• Longer term prevention
  – Verapamil 480-720 mg daily
  – Lithium 600-900 mg daily
  – Topiramate, gabapentin, valproic acid
  – Methysergide (limited by fibrosis)
  – NOT B blockers (? Unsafe)

• Procedures
  – Nerve blocks, RF rhizotomy, gamma knife
Hemicrania syndromes

• Indomethacin responsive syndromes
  – Cough, exercise, coital
  – 75 mg tid
Diagnostic work up in HA

• None except good H and P
  – Headache diary can be very helpful
  – Ask about all medications and doses tried (OTC, nutraceuticals and prescription)
  – No lab tests (unless temporal arteritis suspected)
  – Imaging usually not required

• “First, worst or cursed…”
“Red Flags” in HA history/physical

- Acute onset of especially severe HA
- Age of onset >50 yo
- Significant change in HA pattern
- Progressive or increasing medication needs
- Focal neurologic symptoms
- Fever or systemic symptoms
- Precipitated/aggravated by position changes, Valsalva, coughing
Case #1

- 50 year old man with HTN and smoker
- Chopping wood in backyard
- Wife hears him cry out—fallen to ground but no LOC
- “I have the worst headache of my life”
Case #1—Subarachnoid Hemorrhage
Case #2

• 70 yo woman with h/o OA s/p B TKR, migraines during first pregnancy (20 yo)
• 1 month h/o fatigue, malaise, no fevers
• This week has had a moderate R sided headache, throbbing
• Came to your office today after 30 sec episode of vision dimming in R eye
Case #2—Temporal Arteritis

• ESR > 50 but can be normal in 20% of patients
• Urgent treatment with high dose steroids
• Biopsy large (>1 in) segment, ? bilateral
Case #3

- 19 yo woman, no PMH. +FH of migraine in mother and sisters
- On OCPs
- Diarrheal illness a month ago; now 3 week h/o constant L temporal dull aching HA, not responsive to OTC meds
- Last 2 days, nausea and vomited once last night; somewhat drowsy today
Case #3—Cerebral venous sinus thrombosis

MRV of Cerebral Sinus Thrombosis

- Transverse sinus
- Missing transverse sinus
- Sigmoid sinus
- Internal jugular vein

Notice how the patient’s left transverse sinus is “missing” indicating a thrombosis or blood clot is present.
Case #4

- 48 yo man with “borderline” hyperlipidemia
- On no medications
- Came to office because his wife made him
- Past 2 weeks, 2 episodes of severe piercing HA during sexual activity. No neurological symptoms
Case #4—Coital/post coital HA
Case 5

- 28 yo morbidly obese male graduate student with PMH asthma, social smoker
- Only medication—PRN albuterol inhaler
- Under a lot of stress with dissertation, sleeping less, difficulty concentrating
- Past 2-3 months, waking up with headaches that resolve as day goes on
Case #5—Brain Tumor

- OSA, depression, CDH