Diagnosis and Management of Headaches

Dr. Richard H. Leu
Via Christi Family Medicine Residency

Objectives

• Discuss the diagnosis and management of the following headache types:
  • Tension – type headache
  • Migraine headache
  • Menstrual related migraine
  • Cluster headache

Headache Spectrum

• Tension ------- Migraine

• How many types of headaches do you have?

Tension – Type Headache

• Most common headache in adults
• Approximately 40% of adults will treat a tension-type headache in any given year
• Uncommon in children or older adults
Characteristics of Tension – Type Headache

- Bilateral
- Mild to moderate pain
- No aura
- Minimal disability
- Minimal impact of exercise
- Occasional light/sound sensitivity
- Scalp or cervical tenderness

Migraineurs

- 41% report bilateral pain
- 50% report non-pulsating pain
- 75% describe neck pain
- 84% identify stress as a trigger

Pathophysiology of Tension – Type headache

- Heightened sensitivity of nerve cells in the brain
- The “muscular” component is merely a secondary phenomenon

Pathophysiology of Tension – Type headache

- Many experts feel that episodic tension – type headache may merely reflect a milder or less developed version of migraine.
- Tension HA --------- Migraine HA
**Diagnosis of Tension – Type headache**

- Diagnosis is defined by the absence of features typical of migraine or cluster headache.

**Precipitating Factors of Tension – type headache**

- STRESS
- Hunger
- Sleep disruption

**Treatment of Tension – type headache**

- Regulate sleep / meals
- Adequate hydration
- Exercise 30 minutes/day
- Limit alcohol, caffeine and artificial sweeteners

**Treatment of Tension – type headache**

- Stress management
- Biofeedback
- Massage therapy
- Physical therapy (Integrative Manual Therapy)
Acute Treatment of Tension – type headache

- Acetaminophen
- Aspirin products
- Non-steroidal anti-inflammatory drugs
- Limit use to 2-3 days/week to avoid rebound headache

Preventive Treatment of Tension – type headache

- Antidepressants (amitriptyline)
- Anti-seizure medications (topiramate; valproic acid / divalproex)
- Little scientific evidence to support the use of anti-seizure medications in tension – type headache
- Don’t use muscle relaxants long-term

Migraine

- Migraine is a recurrent headache that lasts 4-72 hours
- 18% of women
- 6% of men
- Under diagnosed and under treated

Typical Features of Migraine

- Usually one sided
- Pulsating, throbbing, pounding
- Aggravated by routine physical activity
- Associated with nausea and vomiting
- Sensitivity to light / noise
“ID Migraine”

- Has a headache limited your activities for a day or more in the last 3 months?
- Are you nauseated or sick to your stomach when you have a headache?
- Does light bother you when you have a headache?

Migraine

- Aura --- 15%
- Warning signs --- 70%
  - Fatigue
  - Mood changes
  - Food cravings
  - Poor concentration

Pathophysiology of Migraine

- The nervous system is more sensitive and vigilant to the environment
- Inflammation of nerves and vessels in the brain

Approach to Treatment

- Goal is to give the patient control over their headaches instead of the headaches controlling the patient's life.
Principles of Treatment

- Prevention (prophylactic measures)
- Abortive treatment
- Elimination of intractable migraines

Preventive Measures

- Diet
- Sleep
- Exercise
- Weight loss
- Caffeine regulation
- Smoking cessation
- Medications

Diet

- Don’t Skip Meals!!
- Big Four: chocolate, NutraSweet, caffeine and MSG
- Keep a headache diary

Sleep

- Goal is 7-8 hrs of restful sleep
- Increased frequency with < 6 hrs of sleep
- Increased frequency with > 9 hrs of sleep
- Regulate sleep 7 days per week
Disorders of Sleep

- Poor sleep hygiene
- Sleep apnea
- Depression

Exercise / Weight Loss

- Adipose tissue secretes proteins & hormones that help regulate immunity & inflammation (adiponectin, interleukin-6)
- Dieting and exercise can improve headaches
- Weight may affect choice of medications

Caffeine

Two – edged sword

- 100 – 200 mg = well being
- 300 – 400 mg = anxiety, dysphoria
- 340 – 750 mg = severe anxiety, panic attacks
- 5 – 10 grams (75 cups of coffee) = lethal dose
- Try to eliminate caffeine use in patients with severe migraines (taper slowly)

Caffeine in Medications

- Several medications used for headache relief contain various amounts of caffeine.
- These combination medications commonly cause “rebound headaches” if used more than three days per week
Smoking

- Smoking increases frequency of headaches
- Smoking cessation:
  - Varenicline (Chantix)
  - Bupropion (Zyban)
  - Nicotine patches/gum
  - Hypnosis

Prevention

When to Consider Prevention with Medications

- Headache occurs more than 2 days per week
- Use of acute medications more than 2 days per week
- Headache attacks that are disabling despite treatment
- Prolonged aura, complex aura or migraine-induced stroke
- Patient desires to reduce frequency

Principles of Prevention

- Reduce frequency of attacks by more than 50%
- Start low; Go slow
- Often requires lower dosages
- May take 2-3 months to see benefit
- Maintain for 6-12 months once 50% reduction achieved, then taper
- Reduces cortical spreading depression (CSD)
Evidence-based Recommendations for Preventive Treatment

• 2012 AHS/AAN Guidelines for Prevention of Episodic Migraine

Major Classes of Medications for Prevention

• Beta-adrenergic blockers
• Antidepressants
• Anticonvulsants (neurostabilizers)
• Calcium antagonists
• NSAIDs
• Herbal preparations

Migraine Prevention – Level A (established as effective)

• Valproic acid / Divalproex (Depakote) - 400-1000 mg/d
• Metoprolol (Lopressor) - 47.5-200 mg/d
• Butterbur (Petadolex) - 75 mg bid or 50 mg bid – tid
• Propranolol (Inderal) - 120-240 mg/d
• Timolol (Blocadren) - 10-15 mg bid
• Topiramate (Topamax) - 25-200 mg/d

Butterbur - Petadolex

• 71% of adults and 77% of children cut migraine attacks in half after three months
• Adults: 75 mg bid with meals or 50 mg tid with meals
• Children: (6-9 yrs) – 50 mg with evening meal
• Children: (10-17 yrs) – 50 mg bid with meals
## Migraine Prevention – Level B
(probably effective)

- **Amitriptyline (Endep)** - 25-150 mg/d
- **Ibuprofen (Motrin/Advil)** - 200 mg bid
- **Naproxen (Aleve)** - 500 mg bid
- **Magnesium** - 400-600 mg/d
- **Riboflavin** - 400 mg/d
- **Venlafaxine (Effexor ER)** - 150 mg/d

## Migraine Prevention – Level B
(probably effective)

- **Fenoprofen (Nalfon)** - 200-600 mg tid
- **Ketoprofen (Oruvail)** - 50 mg tid
- **Histamine** - 1-10 ng subq 2x/week
- **Feverfew** - 50-300 mg bid; 2.08-18.75 mg tid for MIG-99 preparation
- **Atenolol (Tenormin)** - 100 mg/d

## Migraine Prevention – Level C
(possibly effective)

- **Carbamazepine (Tegretol)** - 600 mg/d
- **Lisinopril (Zestril)** - 10-20 mg/d
- **Coenzyme Q10** - 100 mg tid
- **Cyproheptadine (Periactin)** - 4 mg/d
- **Pindolol (Visken)** - 10 mg/d
- **Clonidine (Catapres)** (patches also studied) - 0.075-.15mg/d

## Migraine Prevention – Level C
(possibly effective)

- **Candesartan (Atacand)** - 16 mg/d
- **Guanfacine (Tenex)** - 0.5-1 mg/d
- **Nebivolol (Bystolic)** - 5 mg/d
- **Flurbiprofen (Ansaid)** - 200 mg/d
- **Mefenamic acid (Ponstel)** - 500 mg tid
Migraine Prevention – Level U (inadequate evidence)

- Acetazolamide (Diamox)
- Fluoxetine (Prozac)
- Indomethacin (Indocin)
- Verapamil (Calan/Isoptin)
- Hyperbaric O2
- Nifedipine (Procardia/Adalat)
- Gabapentin (Neurontin)

Migraine Prevention – Level U (inadequate evidence)

- Fluvoxamine (Luvox)
- Protriptyline (Vivactil)
- Nicardipine (Cardene)
- Nimodipine (Nimotop)
- Warfarin (Coumadin)
- Aspirin

Migraine Prevention – Level U (inadequate evidence)

- Omega 3 acid (Lovaza)
- Acenocoumarol (Sintrom)
- Cyclandelate
- Picotamide
- Bisoprolol (Zebeta)

Migraine Prevention (probably ineffective)

- Clomipramine (Anafranil)
- Clonazepam (Klonopin)
- Acebutolol (Sectral)
- Lamotrigine (Lamictal)
Migraine Prevention (probably ineffective)

- Montelukast (Singulair)
- Nabumetone (Relafen)
- Oxcarbazepine (Trileptal)
- Telmisartan (Micardis)

In one study, 3 mg of melatonin taken 30 minutes before bedtime for three months decreased the number of migraines by almost 2/3 and reduced severity by half.

Side – effects of Melatonin

- The side – effects noted in this study included:
- Excessive sleepiness
- Hair loss
- Increased sexual libido

Botox

- Approved by FDA for treatment of chronic migraines in adults
- Children age > 10 with chronic headaches have had excellent results
- Cost is a drawback – must code as chronic migraine (346.70)
Principles of Abortive Therapy

- Use the most effective therapy at the onset of the migraine
- Must always have medication with you!
- Try to limit acute treatments to 3x per week

Common Abortive Medications

- NSAIDs
- Aspirin
- Combination analgesics with caffeine
- Triptans
- Antiemetics (often used in combination with NSAIDs or Triptans)

Triptans

- Use with Naproxen 500 mg at onset of migraine
- Use most appropriate delivery mode
- Failure = no response to three different triptans

Triptans

- May use Triptans with SSRIs (inform pt of symptoms of serotonin syndrome)
- Treat the headache; not the aura
Evidence-based Recommendations for Acute Treatment of Migraine

- Triptans as initial treatment for moderate to severe migraine – Grade A
- Triptans as initial treatment for migraine of any severity when nonspecific treatment has failed – Grade C

Evidence-based Recommendations for Acute Treatment of Migraine

- DHE nasal spray for moderate to severe migraine - Grade A
- DHE (IM, SC) for moderate to severe migraine – Grade B
- DHE (IV) plus antiemetic (IV) for severe migraine – Grade B
- Ergotamine (Ergomar) for moderate to severe migraine – Grade B

Evidence-based Recommendations for Acute Treatment of Migraine

- Metoclopramide (Reglan) IV / IM to control nausea – Grade C
- Metoclopramide (Reglan) IV as monotherapy for migraine pain relief – Grade B
- Prochlorperazine (Compazine) IV, IM, PR for migraine in appropriate setting – Grade B

Evidence-based Recommendations for Acute Treatment of Migraine

- Acetaminophen not recommended – Grade B
- NSAIDs and combination analgesics with caffeine as first-line treatment for mild-moderate attacks – Grade A
- Corticosteroids (dexamethasone 16 mg IV or PO) for rescue therapy for status migrainosus – Grade C
Abortive Therapy

• WHO lists aspirin as an essential medication for treatment of migraine in adults

• FDA – approved dose for migraine is 1000 mg for a one-time administration in 24 hours; limit use to max of 3x/week to prevent rebound headaches

Economic Migraine Treatment

• Prevention:
  • 1. Lifestyle changes
  • 2. Melatonin 3 mg 30 minutes before hs

Abortive Therapy:

• 1. ASA 1000 mg plus metoclopramide; prochlorperazine or promethazine at onset of migraine
• 2. limit use to once in 24 hours; max of 3x per week

Difficult to Treat Migraines

• DHE (Migranal) nasal spray
  – One spray each nostril
  – May repeat in 15 mins.
  – Max: 4 sprays / attack
    6 sprays / 24 hrs
    8 sprays / week
  – Use with an antiemetic

Intractable Migraine

• Inflammation !!!

  Dexamethasone 8mg /16 mg IM, IV or oral as a single dose

  Prednisone 50 mg daily x 3 days

  Methylprednisolone (Solumedrol) 80 mg IM

  Ketorolac (Toradol) 60 mg IM
Intractable Migraine

- 5 day Dexamethasone taper:
  - Use 0.75 mg tablets
  - Take two tablets twice daily x 2 days
  - Take one tablet twice daily x 1 day
  - Take one tablet daily x 2 days

Steroids in Pregnancy

- Steroids should not be used in patients less than 10 weeks gestation due to increased risk of cleft palate

Intractable Migraine (ER or Infusion Center)

- D.H.E. 45 – 1 mg IV; dilute in 50 ml of NS and run in over 30 minutes; don't use if pt. took a triptan within 24 hours; always use with an antiemetic (may repeat in 1 hour x 2 doses; max of 3 mg/attack and 6 mg / week)
- Magnesium sulfate 1 gram IV; dilute in 50 ml of NS and run in over 30 minutes; may repeat in 8-12 hours
- Caffeine sodium benzoate 500 mg IV; dilute in one liter of NS and run in over one hour

Intractable Migraine (ER or Infusion Center)

- Valproic acid/Divalproex (Depacon) – 500 – 1000 mg IV; dilute 1:1 with NS and run in over 15 minutes
- Antiemetics – IV
- Diphenhydramine (Benadryl) 25 – 50 mg IV
- Hydromorphone (Dilaudid) 2 mg IV
Infusion Center Protocol

- IV caffeine sodium benzoate 500 mg in one liter of NS over one hour
- Prochlorperazine (Compazine) 10 mg IV
- Diphenhydramine (Benadryl) 50 mg IV
- Dexamethasone 8 or 16 mg IV upon completion of caffeine infusion and discharge to home
- Limit to 2 – 4 times per month
- Use Dexamethasone only 1x/month

Infusion Center Protocol

- Infuse one liter of NS over one hour
- Magnesium sulfate – 1 gm diluted in 50 ml of NS and infuse over 30 minutes
- Metoclopramide (Reglan) 10 mg IV
- Hydromorphone (Dilaudid) 2 mg IV
- Dexamethasone 8mg or 16 mg IV upon completion of infusion
- May use 2-4x/month
- Use dexamethasone only 1x/month

Inpatient Treatment

- IV antiemetic followed by D.H.E. 45 0.5 - 1 mg IV
- Repeat every 8 hours x 3 days

Outpt. Modification of Inpatient Protocol

- IV/IM antiemetic
- DHE-45 – 0.5 mg IV diluted in 50 ml of NS and infuse over 30 minutes; start 20 minutes after antiemetic; don’t start if pt took a triptan in previous 24 hours
- Give twice daily (8 hours apart) for three consecutive days if needed
- May use up protocol up to 2x per month (at least one week apart)
- Often will give 5 day dexamethasone taper with first protocol for the month
MRI/MRA
Indications

• New onset headache < age 5 or > age 50
• Exacerbation of headache with physical activity
• A change in patient’s headache pattern
• Patients with a past history of cancer or immunosuppression

Menstrual – Related Migraine

• Pure menstrual migraine is uncommon
• 60% of migraineurs have attacks related to menses
• MRM – attack occurs 2 days before and up to 2 days after the menses

Treatment of Acute Attacks of MRM

• Behavioral management – avoid triggers
• NSAIDs
• DHE – nasal spray, IM, SC
• Triptans
• Acetaminophen/ASA/Caffeine

Intractable Acute Attacks of MRM

• Analgesics
• Corticosteroids
• Any of previous infusion center protocols
Preventive Treatment for MRM

Level A
Level A: established as effective

Should be offered to patients requiring prophylaxis

Frovatriptan (Frova) – 2.5 mg bid for 5 days perimenstrually (loading dose was used)

Level B
• Level B: probably effective
• Should be considered for patients requiring prophylaxis
• Naratriptan (Amerge) – 1 mg bid for 5 days perimenstrually (no loading dose)
• Zolmitriptan (Zomig) – 2.5 mg bid or tid for 5 days perimenstrually (no loading dose)

Level C
• Level C: possibly effective
• May be considered for patients requiring prophylaxis
• Estrogen – 1.5 mg estradiol in gel (EstroGel) daily x 7 days perimenstrually

(expert opinion)
• Start Naproxen 500 mg bid with food two to three days before onset of menses and continue through the menses
Preventive Treatment for MRM

- Melatonin levels have been shown to be decreased during menses in women with menstrual migraine
- Melatonin may be helpful in the prevention of menstrual related migraine

Hormonal Treatment of MRM

- Use a 20 mcg ethinyl estradiol mono-phasic OCP for 3-4 months consecutively; then off for 1 week using synthetic conjugated estrogen A (Cenestin) 0.9 mg daily as an estrogen supplement during the week off the active pills
- Repeat cycle

Hormonal Treatment in MRM

Menstrual migraines are triggered by drops in estrogen
Don’t be overly concerned about using a low-dose (20 mcg of ethinyl estradiol) OC in women with migraine if they are under 35 yrs; have normal BP; don’t smoke and do not have an aura

Hormonal Treatment of MRM

- Levonorgestrel/ethinyl estradiol (LoSeasonique) with synthetic conjugated estrogen A (Cenestin) 0.9 mg daily during the 13th week (week off between 12 week cycles of LoSeasonique)
- May use extended regimes using ethinyl estradiol/norelgestromin (OrthoEvra patch) or ethinyl estradiol/etonogestrel (NuvaRing)
Cluster Headache

- Attacks frequently occur at night
- One to several headaches / day
- Short duration (30 – 45 minutes); rarely last over 4 hours

Cluster Headache

- Describes headache pattern
- Clusters can last days to months
- Remission (often for years)
- Seasonal (spring or fall)

Cluster Headache

- Men/Women = 5:1
- Onset 20 – 40 yrs of age
- Always one – sided (behind eye)
- Excruciating pain (hot poker in eye)
- Patient paces

Cluster Headache

- May have flushing of face, tearing, nasal congestion or runny nose
- Pupil may contract
- Eyelid may be swollen or droop
- “Lower half syndrome” – cheek and mouth affected instead of eye, temple and forehead
**Treatment of Cluster Headache**

- Avoid alcohol
- Avoid use of nitrates if possible (lower dose)
- Avoid food triggers that contain tyramine—cheeses, citrus fruits, chocolate, processed meats, MSG, nuts, seeds and peanut butter

**Abortive Therapy for Cluster Headache**

- Classic abortive therapy is inhalation of 100% oxygen (7 – 15 liters by mask for 15 minutes)
- Sumatriptan injection is highly effective
- Zomig nasal spray (10 mg) achieved relief in 30 minutes in 61% of patients in one study

**Abortive Therapy for Cluster Headache**

- Ergotamines (orally, sublingual, IM, nasal spray or suppository)
- Nasal lidocaine – 4% solution; soak 2 cotton applicators and advance into the nose; blocks the sphenopalatine ganglion

**Preventive Therapy for Cluster Headache**

- Preventive therapy is used to reduce frequency, duration, intensity and interrupt the cluster cycle
- Daily treatment is begun at the onset of a new cycle
- It does not prevent future clusters so treatment is tapered gradually over 2-4 weeks after the last attack
Preventive Medications for Cluster Headache

- Lithium carbonate (not well tolerated)
- Verapamil (up to 1200 mg/day) combined with topiramate, depakote or lithium
- Steroid taper
- Ergotamine
- Melatonin – 9 – 12 mg

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