Headache Management
Migraines and Persistent Pain

STUART B BLACK, M.D; FAAN
MEDICAL DIRECTOR
DALLAS HEADACHE ASSOCIATION

Migraine causes average of 1 1/2 hours lost work time per week
Migraine cost employers $13 billion per yr in lost productivity
69% have reduced work effectiveness during a MH attack

Fortunately your headache isn't a serious problem.
I don't know what to do. I bet he thinks I just have a headache but I'm about to lose my job

91% of migraineurs experience functional impairment
25% or migraineurs have at least one attack per week
$14 Billion annual expense for direct & indirect medical costs

Don't worry. We have pain Medications to get rid of your migraine. You can even repeat them if needed.
I am worried. If my headache isn't gone within 1 to 2 hours, I'm done for the day; not only will I not make it to work but tonight I will be in bed and won't be able to enjoy my family.
Migraine is an episodic recurrent headache lasting 4-72 hours with:

- unilateral pain
- throbbing pain
- pain worsened by movement
- moderate/severe pain

Any 2 of these pain qualities: Any 1 associated symptom

- nausea
- vomiting
- photophobia and/or phonophobia

Migraine with Aura

Symptoms develop gradually over >5 minutes
Symptoms last less than 60 minutes
Headache follows aura with free interval of < 60 minutes


The Self-Administered 3-Item ID Migraine Questionnaire in Primary Care

- Dysfunction: Have you had “functional impairment due to headache in last 3 months”?
- Photophobia: Does “light bother you (a lot more than when you don’t have headaches)”?
- Nausea: Do “you feel nauseated or sick to your stomach”?

Migraine indicated when more than 2 items are endorsed

The positive predictive value is 93% when 2 or more symptoms are present


Classic Vascular Theory of Migraine

- Aura Phase: Spasm of Cerebral Arteries
- Headache Phase: Vasodilation of Cerebral Arteries

Wolf HG. Headache and Other Head Pain. 1963.
How Does Migraine Begin
Cortical Spreading Depression

- Platelet Activation
- Glutamate Release
- Leaky BBB
- Vasodilatation
- Inflammation
- Decreases CBF 20% to 30% for 2-6 hours
- Slow arterial flow
- Oligemia
- Intravascular Coagulation

CSD Stimulates Trigeminal Sensory Fibers

- Trigeminal nerve fibers in the meningeal blood vessel

CSD Releases Inflammatory Neuropptides
CGRP, Substance P & Inflammatory Cytokines
Vasodilation and Edema in Local Blood Vessels
Leaky BBB with Tissue Edema and Inflammation

- CGRP and prostaglandins cause inflammation and vasodilation of cerebral and meningeal blood vessels as well as inflammation and edema of surrounding tissue.

Central Trigeminal Sensitization

- Sensitized peripheral neuron (trigeminal ganglion)
- Activated central neuron
- Cutaneous allodynia
- Throbbing pain
- Muscle tenderness

Cutaneous allodynia is a marker for central sensitization, which when present during a migraine, may make the migraine episode more difficult to treat.

A sustained pain-free response is harder to achieve.

Symptoms of Central Sensitization

Patients often avoid 1 or more of the following activities because of cutaneous allodynia:

- Combing hair
- Pulling hair back (ponytail)
- Shaving
- Wearing eyeglasses
- Wearing contact lenses
- Wearing jewelry
- Wearing snug clothing
- Using a heavy blanket in bed
- Allowing shower water to hit the face (“it feels like pins and needles”)
- Resting the face on the pillow on the migraine side
- Rubbing back of neck
- Cooking (“the heat is too much”)
- Breathing through the nose on cold days (“it burns”)

Case # 1

☐ 31-year-old graphic artist; on OC for number of years
☐ 2 yr history of moderate-to-severe unilateral headaches, lasting 1 to 3 days, often associated with nausea and vomiting. Episodic headaches occur at least 4 - 6 times per month. In addition has debilitating headaches during menses. Those headaches last 2 – 4 days.
☐ Takes high doses of OTC, mostly Excedrin, with moderate to little relief. Has never consulted her physician
☐ Gastric distress has developed due to OTC use

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Pattern of Migraine Around Menses
A Clinical Classification

Premenstrual migraine (Days -7 to -2)
Menstrual migraine (Days -2 to +3 exclusively)
Menstrually-related migraine peaks near menses, yet is present throughout the cycle

Cycle Days: -7 -6 -5 -4 -3 -2 -1 1 2 3 4
Weeks 2-3 (Day menses begins)

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TRIPTANS

Sumatriptan
Rizatriptan
Naratriptan
Zolmitriptan
Pitofetan
Almotriptan
Eletriptan

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When to Consider Preventive Therapy

- The migraine attacks interfere with a patient’s daily routine with related dysfunction three or more days per month
- Attacks occur more than two per week even with adequate acute care
- Migraine duration > 48 hours
- Acute medications are ineffective, contraindicated, overused, or not tolerated
- The patient prefers preventive therapy
- The patient has an uncommon migraine condition (eg, hemiplegic migraine, migrainous infarction, migraine with prolonged aura)


American Migraine Prevalence and Prevention study (AMPP)

Migraine Prevention Is Underutilized

- 40% of migraine sufferers may be eligible for prevention
- 13% of all migraine sufferers currently receive prevention


Case # 2

- 36 year old woman with disabling migraines
- Excellent health; uses tobacco
- Has visual aura lasting < 1 hr
- Averages 3 migraines per month lasting up to 2-3 days. Sometimes misses work
- Treats migraines with triptans and analgesics
- Takes no other meds except Oral Contraceptives
- 1 to 2 ER visits per year
Oral Contraceptives and the Risk of Stroke

- Low dose estrogens (<50 µg estradiol) have lower stroke risk than do high dose (≥50 µg estradiol) estrogens.
- Most of the increased stroke risk is considered to be attributable to the estrogen component of OCs.
- Limited data for progestin-only OCs.
- Relative risk of stroke is greatly increased if associated risk factors are present, in particular, hypertension, cigarette smoking, and migraine.

Migraine as a Risk Factor for Stroke

- Stroke risk in young (<45 years) female population is generally very low.
- Estimated to be between 5 and 10 per 100,000 woman-years.
- However, there is increased stroke risk (odds ratio) in women migraineurs under age 45:
  - Migraine: 3
  - Migraine with aura: 6
  - Migraine plus OCs: 5
  - Migraine plus OCs plus smoking: 34
- Relative risk seems high, but absolute risk in migraineurs is low:
  - 17 to 19 in 100,000.
- There is no evidence that migraine is a risk factor for stroke in women over age 45.

Case #3

- History of headaches for 20 years. Initially migraine about 5 times a month. About 4 years ago, developed milder daily headaches with migrainous headache 2 times a week.
- Started daily OTC 4-5 years ago and daily prescription medications 2-3 years ago. Taking hydrocodone about 4 days a wk.
- Daily headaches are now disabling without the use of daily analgesics. Prophylactic medications not helpful.
- Missing work and social activities.
Chronic Daily Headache Classification

CHRONIC MIGRAINE
With/without medication overuse

CHRONIC TENSION-TYPE HEADACHE
With/without medication overuse

NEW DAILY PERSISTENT HEADACHE
With/without medication overuse

HEMICRANIA CONTINUA
With/without medication overuse

Risk Factors for Chronic Daily Headache

Not readily modifiable
- Migraine
- Female sex
- Low educational/socioeconomic status
- Head injury

Readily modifiable
- Attack frequency
- Obesity
- Medication overuse
- Stressful life events
- Snoring (sleep apnea, sleep disturbance)

Other prognosticators
- Multiple migraine triggers ("migraine soup")
- Paternal history of headaches
- Surgical menopause
- Complicated aura
- Cutaneous allodynia

Medication Overuse Headache
IHS Diagnostic Criteria Jun 06

A. Headache present for > 15 days / month

B. Regular overuse for > 3 months of one or more acute / symptomatic treatment drugs:
   1. Ergotamine, triptans, opioids, or combination analgesic
      medications on > 10 days / month on a regular basis for
      > 3 months
   2. Simple analgesics or any combination of ergotamine,
      triptans, analgesics opioids on > 15 days / month on a
      regular basis for > 3 months without overuse of any
      single class alone.

C. Headache has developed or markedly worsened during
   medication overuse

Pharmacologic Treatment Of MOH

- Headache Diary for documentation
- Be explicit about medication doses, frequency and limits of use
- Discourage PRN usage for mild headache during the washout period
- Provide adequate rescue medication for moderate or severe headache with appropriate limits
- Restrict total use of all acute headache drugs to 10 DAYS PER MONTH (2004 IHS recommendation)
- NO REFILLS FOR PRN MEDS during washout period
- Hospitalization for IV therapy may be necessary

Headache Classification Subcommittee of the International Headache Society
The International Classification of Headache Disorders. Cephalagia 2004 24. (supp 1).

Inpatient Treatment Plan

1. Detoxification and rehydration
2. Pain control with IV therapy
3. Establish prophylactic therapy
4. Patient education
5. Behavioral therapy
6. Outpatient H/A program

IV Treatment Options
- IV DHE
- IV Corticosteroids
- IV Neuroleptics
- IV Caffeine
- IV Magnesium
- IV Anticonvulsants
- IV Diphenhydramine

34 Year Old Woman

Ten Year History Of Migraine

- Two day history severe headache with nausea. Did not respond to usual migraine medications. "The worse migraine I ever had". Developed persistent vomiting. Rescue medication not helpful.
- Complained of "dizziness". Noticed to have unsteadiness of gait.
- Symptoms progressive.
- Past Medical History:
  - Episodic migraine W/O aura
  - On OC >15 years
  - No other risk factors
- Became more debilitated.
- Brought to ER
Neurological Exam:
Truncal and Appendicular ataxia; Horizontal Nystagmus

Cerebellar Infarction
Vertebral Artery Dissection

Advances In Migraine Pathogenesis
Therapeutic Implications