Is All Headache Pain The Same? Diagnostic and Treatment Pearls

Christy M. Jackson, MD
Director, Dalessio Headache Center
Scripps Clinic

International Classification of Headache Disorders

- Second Edition Jan 2004
- 4 Primary Headache Categories
- 8 Secondary Headache Categories
- **New**: Trigeminal Autonomic Cephalalgias
- **New**: Sub classification of TTH
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ICH D -2 Primary Headaches

**Table 1** First level of The International Classification of Headache Disorders, 2nd edition

<table>
<thead>
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<th>Part one: The primary headaches</th>
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<tbody>
<tr>
<td>1. Migraine</td>
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<td>2. Tension-type headache (TTH)</td>
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<tr>
<td>3. Cluster headache and other trigeminal autonomic cephalalgias</td>
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<td>4. Other primary headaches</td>
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ICDH -2 Secondary Headaches

<table>
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<td>6. Headache attributed to cranial or cervical vascular disorder</td>
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<td>11. Headache or facial pain attributed to disorder of cranium, neck, eyes, ears, nose, sinuses, teeth, mouth, or other facial or cranial structures</td>
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<td>12. Headache attributed to psychiatric disorder</td>
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Differential Diagnosis of Primary Headaches

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Migraine Prevalence Peaks in the 25-55 Age Range for Both Genders

Consulting Patterns
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PCP/Non-specialists Lead the List of Healthcare Practitioners Consulted Prior to a Diagnosis of Migraine*

- PCP/Non-specialist: 82%
- HA Specialist: 24%
- Alternative Medicine: 16%
- Counseling: 9%

*Categories Not Mutually Exclusive

Undiagnosed Migraine Sufferers Often Receive Other Medical Diagnoses

- Tension-type HA: 32%
- Sinus HA: 42%
Criteria for office diagnosis of migraine with aura

A. Headache pain is preceded by at least one of the following neurologic symptoms:
   - Visual
     - Scintillating scotoma
     - Fortification spectra
     - Photopsia
   - Sensory
     - Paresthesia
     - Numbness
     - Unilateral weakness
     - Speech disturbance (aphasia)

B. No evidence of organic disease

Criteria for office diagnosis of migraine without aura

A. Two of the following:
   - Unilateral headache pain location
   - Headache pain has pulsating quality
   - Nausea
   - Photophobia and phonophobia

B. Both of the following:
   - Similar pain in the past
   - No evidence of organic disease
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Hierarchy of Migraine Manifestation

Level 1: Moderate/intermittent—respond well to OTC medications
Level 2: Intense—unresponsive to OTC medications
Level 3: Less responsive to simple interventions—preventive and abortive medications sought
Level 4: Daily headaches associated with analgesic overuse

Reference: 6. Ophoff, R.A. et al.: Familial hemiplegic migraine and episodic ataxia type-2 are caused by mutations in the Ca²⁺ channel gene CACNL1A4, Cell 87:543-552, November 1, 1996
Migraine Activity May Start in the Cortex with Cortical Spreading Depression


Trigeminal Nerves Surrounding Meningeal Blood Vessels are Activated

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**Neurochemical Release leads to Neurochemical Production**

- Kinins start the process leading to prostaglandin synthesis
  - Kinins facilitate the production of cyclooxygenases
  - Cyclooxygenases convert arachidonic acid to prostaglandins


**Inflammation Activates Pain Receptors Leading to Pain Transmission**

- Inflammation and vasodilation sensitize peripheral meningeal pain receptors and lead to pain transmission
- Pain Receptors transmit signals to the trigeminal ganglion and the TNC
- When the TNC transmits pain signals to thalamus & cerebral cortex, the patient first feels pain

[Silberstein SD. Cephalalgia. 2004; 24(suppl 2):2-7.](#)
Treatment of Migraine

- Nonpharmacologic
- Pharmacologic
  - Acute (abortive)
  - Preventive (prophylactic)

Potential triggers of migraine

- Hormones
- Chronobiologic challenges
- Carbon monoxide
- Sensory stimuli
- Foods and beverages
- Drugs
- Emotional stress
Integrative Approaches to Headache Management

- Evidence Based usage of supplements
  - Riboflavin
  - Magnesium
  - Petadolax
  - Coenzyme Q10
- Biofeedback
- Acupuncture
- Physical Therapy
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**Stratified Care Approach to Migraine/Headache Treatment**

- Headache suffering → Consult physician → Migraine diagnosis → Treatment needs are assessed (pain and disability)
  - High treatment needs → Education → Consider prophylaxis → Consider 5-HT1 agonists
  - Intermediate treatment needs → Education → Consider prophylaxis → Combination analgesics
  - Low treatment needs → Education → Simple analgesics

**Acute Medications**

- Simple analgesics
- Combination analgesics
- NSAIDs
- Ergots
- Selective 5HT1 agonists
- Antiemetics
- Major tranquilizers
- Corticosteroids
- Anxiolytics
- Narcotics

Acute Management

- Mostly migraine cases, some cluster
- Outpatient vs Inpatient strategies
- Infusion Centers will obviate the need for UCC or ER evaluation

Outpatient Strategies

- Status Migrainosis
- Intractable Cluster
- Severe Muscle Contraction Pain
- Trigeminal Neuralgia
**Status Migrainosis**

- Classical definition is unremitting migraine for more than 72 hours
- Prednisone taper of 60 mg initially with 5 or 10 day taper
- Toradol injection, nasal spray or tablets
- Triptan injectable if not tried already with antinauseant
- Occipital Nerve Block
- Infusion center or admission

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**New Options for Migraine Treatment**

- Calcitonin Gene Receptor Protein (CGRP) Inhibitor – Telcagepant
- Occipital Nerve Stimulation
- Sumatriptan Air Injector
- Sumatriptan patch
- Toradol nasal spray - Sprix
- DHE Inhalation Apparatus - Levadex
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Consider Preventive Medication

- When headache-related disability occurs ≥3 days / mo
- When symptomatic medications are
  - Ineffective
  - Contraindicated
  - Likely to be overused
- When special circumstances exist
  - Attacks produce profound disability
  - Attacks produce prolonged auras
  - True migrainous infarction

Migraine and Comorbidities

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<th>Condition</th>
<th>Acceptable therapies</th>
<th>Therapies to avoid</th>
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<td>Tricyclic antidepressants, Selective serotonin reuptake inhibitors</td>
<td>Beta-blockers</td>
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<td>Anxiety</td>
<td>Beta-blockers, Divalproex sodium</td>
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New Options for Migraine Prophylaxis

- Namenda
- Savella
- Botulinum Toxin 155-195 units every 3 months

Hypotheses: Mechanisms of Botox A in Headache

- May reduce pericranial muscular tension and contractions
- May directly affect sensory nerves – possibly reducing neuropeptide release
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Dosing of BTX-A in Headache

- FDA recommendations for 155-190 units Botox A
- Fixed site of 31 standard sites used
- Every 12 weeks

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Criteria for office diagnosis of cluster headache

A. Severe unilateral orbital, supraorbital, and/or temporal pain lasting 15 to 180 minutes

B. At least one of the following on the headache side:
   - Conjunctival injection
   - Facial sweating
   - Lacrimation
   - Miosis
   - Nasal congestion
   - Ptoea
   - Rhinorrhea
   - Eyelid edema

C. No evidence of organic disease

Cluster: patient behavior

- restless
- often paces or sits up
- reports of violence during attack
- may scream or moan
- lowers head with pressure over eye
- period of exhaustion follows
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Cluster: patient features
- high incidence of duodenal ulcers and gastric acid levels
- ruddy complexion, orange-peel skin
- deep nasolabial folds
- increased incidence of hazel eye color
- heavy smokers
- increased alcohol usage vs controls

Cluster: pathogenesis
- intracavernous carotid artery
- trigeminovascular activation
- sympathetic and parasympathetic activation
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Cluster Headache Treatment

- **Acute Therapy**
  - High Flow Oxygen
  - Triptan
  - DHE

- **Suppressant Therapy**
  - Steroids
  - Indomethacin
  - Ca Channel Blocker
  - Lithium
  - Topiramate
  - Warfarin

*Warfarin for Refractory Cluster Headache, Hakim, S Headache 51:5, 713*

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Criteria for office diagnosis of episodic tension-type headache

A. Headache pain accompanied by two of the following symptoms:
   - Pressing/tightening (nonpulsating) quality
   - Bilateral location
   - Not aggravated by routine physical activity

B. Headache pain accompanied by both of the following symptoms:
   - No nausea or vomiting
   - Photophobia and phonophobia absent or only one present

C. Fewer than 15 days per month with headache

D. No evidence of organic disease

Tension Type Headache Treatment

**Acute:**
- NSAIDs
- Tramadol
- Local heat/cold
- Valium

**Preventive:**
- TCA
- NSAIDs
- Physical Therapy
- TMJ analysis - consider Botox for masseter dystonia
Cervicogenic Headache

- Side Locked, older population or in history of trauma
- Originates at base of skull and travels up over scalp to eye
- May become pulsatile
- Does not meet criteria for migraine
- Responds to occipital nerve blocks, indomethacin

Characteristics of Medication Overuse Headache

- Diffuse, bilateral headache every day, aggravated by physical or mental exertion
- Waking with early morning headache
- Restlessness, nausea, forgetfulness, depression
- Medication withdrawal symptoms when meds missed
- Tolerance to abortive medications
- Lack of efficacy in many preventive medications
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Infusion Center

- Added to the Dalessio Headache Center this year
- Locations at TP, RB and CV
- Entry requires eval by one of our MDs or NPs
- Same day infusion of a cocktail of options

Infusion Cocktail

- IV fluids
- IV Magnesium one gram
- IV Valproic Acid 500mg
- IV Decadron 10 mg
- IV Compazine or Reglan
- IV Toradol 30-60 mg
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Inpatient Strategies

- Medication Overuse Headache largely vs Status Migrainosis
- DHE Protocol
- IV Reglan
- IV Steroids, especially if triptan withdrawal
- Clonidine if indicated for opiate withdrawal
- Phenobarbital if indicated for butalbital withdrawal

DHE Protocol

- Initial test dose of 0.5 mg IV with Reglan as premedication for nausea
- Follow up dosing of 0.2-1.0 mg every 8 hours for 2-3 days
- As outpatient, patient will continue DHE as a subcutaneous injection three times daily for one week, then taper over 3 weeks
Patient Presentation

- 35 year old female
- Presents to office after having been seen in Urgent Care twice in past week for headache, treated and sent home
- CT Brain normal, LP with WBC of 10, otherwise normal
- BP: 134/80, HR 80, AF, Weight 150, Height 5’6”

History

- No prior history of recurrent headache episodes
- No family history of headache
- Mild postural and exertional component to pain
- Global, non pulsatile with no features of photo or phonophobia
Differential Diagnoses

- **Secondary Headache**
  - Meningitis/Encephalitis
  - Pseudotumor
  - Mass lesion
  - Aneurysm
  - Subdural
  - Vasculitis
  - Medication reaction
  - Chiari I
  - Other

- **Primary Headache**
  - New Onset Daily Persistent Headache
  - Medication Overuse Headache

Work Up

- **Imaging**
  - MRI/MRA Brain

- **Laboratory testing**
  - CBC
  - Chemistry panel
  - ESR, CRP, ANA, RPR
  - PTT
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MRI Brain

- Cortical Infarct
- Gyral enhancement

Clinical Update

- MRI tech tells nurse patient had shaking of her left arm during MRI
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Next Step: What is the definitive test?

- Carotid Ultrasound
- MRV
- Brain Biopsy
- EEG

MRV Images
Cerebral Venous Thrombosis

- Main Neurologic Signs and Symptoms
  - Headache 89%
  - Papilledema 28%
  - Generalized seizures 30%
  - Focal seizures 20%
  - Mental Status disorder 30%
- Mean age 39 years
- 3:1 female to male ratio
### Evaluation

- CT Brain less sensitive
- MRI Brain is best noninvasive tool
- MRV is widely used in place of conventional angiography
- CSF exam useful if meningitis/encephalitis is expected
  - May also be therapeutic if elevated ICP present
- Labs
  - CBC, ESR, ANA, PTT, procoagulant workup (Pro C, S, Antithrombin III, Factor V Leiden, Antiphospholipid Ab, Lupus Anticoagulant)

### Management

- Anticoagulation with heparin should be started as soon as possible
- Safe, even in the case of hemorrhagic conversions of bland venous infarcts
- PTT maintained at 2x control until headache resolves, focal deficits stabilize and mental status normalizes
- Local thrombolysis may be necessary
- Maintenance on warfarin 3-6 months or indefinitely if procoagulant state found
- Seizure management
- ICP management with acetazolamide, diuretics