Headaches in Children

Farjam Farzam, M.D.
Pediatric Neurology
University of Kentucky

Headaches in Children

- Common complaint in pediatric population.
- All age groups.
- 2-3 years old.
- Teenagers/Adolescents.
- <2 years: uncertain diagnosis.

Headaches in Children

- Prevalence:
  -7 years old: 35-50%
  -15 years old: 60-80%

Headaches in Children

- Common referral to Pediatric Neurologists.
- Relieve pain/discomfort.
- Relieve parental anxiety/fears.
- Exclude intracranial disease: Brain tumors, Aneurysm.
- Misinterpreted by PCP/families:
  Allergies, sinusitis, eye sight.

Headaches in Children

- Challenging diagnosis in young children.
- Limited verbal, language abilities.
- Poor localization, quality.
- Non-specific complaint.
- Pain rating scale: not helpful.
- Associated with other illnesses.

Headaches in Children

- Serious impact: -
  Physical -
  Emotional: stress, anxiety, anger.
  -***Social***: parents, employments.
  -***Academic***: absenteeism, grades.
  -***Financial***: medications, jobs.

Sources of Headache Pain

- **Intracranial:**
  - -Cerebral Arteries
  - -Dural Arteries
  - -Large Cerebral Veins
  - -Venous Sinuses
  - -Dura Mater brain base
- **Extracranial:**
  - -Skull muscles
  - -Extracranial Arteries
  - -Sinuses
  - -Periosteum
  - -Cervical roots: C1-C3
  - -Cranial nerves: CN5

Common Headache Mechanisms

- Inflammation
- Vasodilation.
- Displacement.
- Traction.
- Stretch.
- Prolonged muscle contractions.

International Classification of Headache Disorders

- **Primary Headache Disorders**
- **Secondary Headaches**

Primary Headache Disorders

- Migraine Headaches
- Tension-type Headaches
- Cluster Headaches
- Hemicranium continuum

Secondary Headache Disorders:

-**Infections**: CNS, OM, Sinusitis.
-**Inflammatory disorders**: Vasculitis, SLE
-**Head trauma**
-**Tumors, Abscess**
-**Stroke**
-**Seizures**
-**Pseudotumor cerebri**
-**Toxicity, Withdrawal**: Caffeine
-**Hypertension**

Common Clinical Headache Patterns

a)***Acute Recurrent***: migraines
b)***Acute Generalized***: systemic illnesses
c)***Acute Localized***: OM, sinusitis, trauma
d)***Chronic Progressive***: masses, hemorrhage
e)***Chronic Non-progressive:*** depression, anxiety

Evaluation of Headaches

- Onset: new or chronic
- Location
- Quality
- Frequency
- Severity
- Duration
- Pattern
- Triggering factors
- Function
- Impact

Migraine Headaches

- 75% of all headache referrals.
- Hereditary disorder.
- Family history: 90%
- All races and ethnic groups.

Migraine Headaches

- **Prevalence**: < 7 years: 2.5%
  7 years-puberty: 5%
  Postpubertal: 10%

❖ **Gender**: Female to Male
-Same: < 7 years
- 3:2 > 7 years
-Estrogen Factor

Migraine Headaches

- ***Triggering Factors:***
  -Stress
  -Exercise
  -Foods: Chocolate, Caffeine, Cheese, MSG, Nitrites, Aspartame, Nuts, Alcohol.

Migraine Headaches

- ***Triggering Factors:***
  -Sleep deprivation
  -Head Trauma
  -Oral contraceptives
  -Allergies
  -Environmental pollution.

Migraine Headaches: Clinical Syndromes

*__International Headache Society (IHS) classification__:

A)Migraine without Aura (Common)

B)Migraine with Aura (Classic)

-Complicated migraines

C)Childhood Periodic Syndromes

Migraine With Auras

- Biphasic Event:
  - a)**Auras**:
  - -Cortical spreading depression.
  - -Waves of cortical excitation.
  - -Neuronal depolarization (Ca+ channels)
  - -Back to front.
  - -Transient neurological disturbances.

Migraine with Auras

- ***Auras***: -
  Visual:
  Dots, spots, colored/sparkling lines, Hemianopia, Transient blindness.

  -Others: Paresthesia, Aphasia, Confusion, Weakness.

Migraine with Auras

b)Increased Blood flow: -
Trigeminovascular system activation
-Substance P
- Calcitonin gene related peptide
-Serotonin: reduced levels
Vasoconstriction and vasodilation.

Migraine with Auras

* Headache: dull, intensifies.
  Forehead, temples, eyes, diffuse.
  Unilateral or Bilateral.
  -Nausea, Vomit, Photophobia, Phonophobia
  -Sleep: helpful.
* Attacks:
  -Auras alone.
  -Headaches alone.
  -Both.

Migraine without Auras

- Common Migraine (more common type)
- Monophasic.
- No auras.
- Headache, nausea, vomit, photophobia, phonophobia.
- Sleep: helpful.

Migraine Equivalent Syndrome

- Now under Migraine with Aura.
- Term is no longer used.
- Focal, complicated migraine patterns.

- Familial Hemiplegic Migraine
- Sporadic Hemiglegic Migraine
- Basilar Migraine.

IHS Classification of Migraines

- ***Ophthalmoplegic Migraines***:
  -Omitted
  -Under Cranial Neuralgias
  -CN III, IV, VI palsies; headaches.

❖ ***Confusional Migraines***:
  -Omitted
  -Overlap of hemiplegic and basilar types.

IHS Classification of Migraines

- ***Childhood Periodic Syndromes:***
  * Precursors of Migraine:
    -Cyclic Vomiting
    -Abdominal Migraine
    -Benign Paroxysmal Vertigo of childhood
    -Benign Paroxysmal Torticollis

Migraine Headaches

- Diagnosis: -History
  -Physical Exam: general, neurological
  -Neuroimaging:
- ➢ * Not routinely recommended.

Migraine Headaches

❑Neuroimaging: CT, MRI of brain
Abnormal exam
Atypical features
Progressive symptoms
Seizures
Uncertain diagnosis

Management of Migraine

- Education
- Acute Attacks
- Prophylaxis

Education

- Reassurance
- Lifelong condition
- Hope/Optimism
- Avoid narcotics, addictive drugs, triggers:
  Stress, sleep deprivation, diet, alcohol, pollution, allergies, exertion.

Acute Attacks

- Ibuprofen
- Acetaminophen
- Excedrin
- Indomethacin.
- Antiemetics:
  - -Prochlorperazine (Compazine)
  - -Metochlopramide (Reglan)
  - -Promethazine (Phenergan): hypnotic

Acute Attacks

- Dihydroergotamine (DHE):
  - -Migranol
  - -Nasal spray.
  - -Intravenous: cardiovascular side effects hypertension, vasoconstriction
- Triptans

Triptans

- Selective Serotonin Agonists
- Not FDA approved in children.
  - -*Exception*:
    - * Sumatriptan nasal spray: >12 y.o.
- Off label use common.

Triptans

- Safe and effective.
- Non-sedative.
- 5-6 years old.

Common Triptans

1)Sumatriptan (Imitrex)
2)Zolmitriptan (Zomig)
3)Rizatriptan (Maxalt)
4)Almotriptan (Axert)
5)Frovatriptan (Frova)
6)Eletriptan (Relpax)

Common Triptans

- Sumatriptan: tablets, nasal sprays, subcutaneous injections.
- Rizatriptan: sublingual tablets
- Zolmitriptan: sublingual tablets, nasal sprays

Acute Attacks

- **Intravenous Valproic Acid**:
  -IV load: 20-30 mg/kg
  -Continuous IV infusion: 1-2 mg/kg/hour
  -24 to 48 hours.
  -Decrease in severity and intensity (65-70%)

Migraine Prophylaxis

- Increasing severity
- Increasing frequency: > 3-4 per month.
- School absenteeism.
- Effective: 4-6 weeks

Migraine Prophylaxis

- ***Beta Blockers***:
  -Propranolol (Inderal): 20-80 mg/day.
  -CNS effects
  -Avoid in Asthma, CHF, Depression

* ***Antihistamines***:
  -Cyproheptadine (Periactin)
  -4 to 8 mg/day.

Migraine Prophylaxis

* ***Tricyclic antidepressants***:
  •Amitriptyline (Elavil): 10-50 mg/day.
  •Nortriptyline (Pamelor): 10-50 mg/day.

Migraine Prophylaxis

*** *Antiepileptic Drugs***:
  -Valproate (Depakote)
  -Topiramate (Topamax)
  -Gabapentin (Neurontin)
  -Levetiracetam (Keppra)
  -Zonisamide (Zonegran)

Migraine Prophylaxis

- **Calcium channel blockers**:
  -Not as effective.
  -Beneficial for Familial Hemiplegic migraines.

Analgesic Rebound Headache

- Common in children; Migraine patients
- Dull, generalized, low intensity
- Frequent, cyclic OTC use
- Interfere with activities
- Management: discontinue/minimize analgesic use
- Effects: 4-6 weeks

Caffeine Headaches

- Common in children, adolescents.
- Soft drinks, Tea, Coffee, chocolate milk
- Headache: dull, diffuse, frontotemporal areas.
- Anxiety, malaise.

Caffeine Headache

- Cycle: -Use more to relieve/avoid headaches. - Addiction
- Mechanism: direct effect, withdrawal
- Management: - Discontinue Caffeine - Effects: 4-6 weeks

Tension Headaches

- Stress, Depression, Anxiety
- Divorce, custody battles
- Abuse: physical, sexual, verbal
- School problems
- Peer relations

Tension Headaches

- Headaches: -Dull, aching -Diffuse, bilateral -Morning: last all day -Almost daily -No nausea, vomit, photo/phonophobia

Tension Headaches

- Examination: normal
- Analgesic rebound headache: may be present
- Management: - Address/resolve the cause of stress - Discontinue analgesics.

Sinusitis

- Common diagnosis: parents, PCP
- Fever, cough, congestion, poor airway clearing.
- Tenderness: frontal, maxillary sinuses
- Pain behind nose: Ethmoidal, Sphenoidal sinuses.

Sinusitis

- Increased pain: -
  Blowing nose -
  Bending head forward
- Diagnosis: -
  Clinically, X-Rays, CT scans. -
  Asymptomatic, coincidental.
- Treatment: -
  Decongestants, antibiotics, surgery.

Pseudotumor Cerebri

- Idiopathic Intracranial Hypertension (IIH)
- Syndrome: -
  Increased Intracranial pressure (ICP) (+/-)
  Papilledema -
  Normal brain imaging results -
  Normal CSF content.

Pseudotumor Cerebri

- Idiopathic: >11 years old.
- Causes: < 6 years old.
- Obese, overweight female: common

Pseudotumor Cerebri

- ***Drugs*:**
  Vitamin A
  Tetracycline
  Corticosteroids
  Thyroid replacement
  Nalidixic Acid
  Oral Contraceptives
- ***Infections***:
  Otitis Media
  Sinusitis
  Mastoiditis
- ***Head Trauma***

Pseudotumor Cerebri

- ***Systemic Disorders***: -
  Iron Deficiency Anemia
  -Leukemia -
  SLE -
  Vitamin A deficiency -
  Vitamin D deficiency -
  Polycythemia Vera
- ***Metabolic Disorders***: -
  Diabetic Ketoacidosis -
  Hyperthyroidism -
  Hypoparathyroidism -
  Pregnancy -
  Galactosemia -
  Adrenal insufficiency -
  Hyperadrenalism

Pseudotumor Cerebri

- ***Headache***: -Diffuse -Wake up in AM -Night (severe) -Increased: coughing, straining, exertion
- Dizziness, irritable, somnolent

Pseudotumor Cerebri

- ***Visual symptoms***: -Blurry, double vision -Visual loss: temporary or permanent.
- Tinnitus, ataxia, paresthesia.
- ***Examination***: -Papilledema -CN 6 palsy -Visual defects

Psudotumor Cerebri

- ***Diagnosis:*** -History, examination -Head CT, MRI: normal -MRV
  -Lumbar puncture: high opening pressure
  -Visual field test/exam

Pseudotumor Cerebri

- ***Management/treatment***:
  -Lumbar Puncture -Acetazolamide (Diamox)
  -Lumboperitoneal Shunts -Optic Nerve Fenestrations

Conclusion

- History and examination: key elements.
- Avoid unnecessary imaging
- Identify triggering factors
- Patient education
- Analgesic rebound headache, Caffeine
- Prophylaxis: essential.