Understanding pediatric headaches

Fast facts

Pediatric headache is the most common neurological complaint that presents to the general pediatrician, urgent care and emergency room, and pediatric neurology. (*References. - 1*) Headache may be underreported as parents or children may minimize the frequency or severity of their headaches to avoid missed activities, or may not even be reported if being treated with over-the-counter medications. (*Ref. - 1*) When discussing with patients/families, it may be helpful to share statistics around prevalence.

i. The lifetime of headache occurrence in children is high at 58%. (*Ref. - 2*)
ii. In young children, headache is more common in boys than girls. (*Ref. - 3*)
iii. 15 to 30% of children experience migraine with aura. (*Ref. - 4*)
iv. The mean age of onset for migraine is 7 years old for boys and 10 years old for girls. (*Ref. - 5*)

Background

A. Headache is both a symptom and a neurological disease. Migraine is the most common headache diagnosis in children. (*Ref. - 6*)
B. Headache is commonly characterized into primary and secondary headache disorders to determine appropriate evaluation and treatment determined by criteria in the International Classification of Headache Disorders (ICHD).
   - **Primary headache** refers to headaches that occur independent of another cause and where headache is the disorder itself. These diagnoses are often seen with a genetic inheritance pattern. Neurologic exam is typically normal.
     - **Migraine:** Characterized by moderate to severe throbbing pain, often unilateral, but can be bilateral in the pediatric population, and is often accompanied by ***BOTH*** *light and sound sensitivity* ***OR*** *the presence of nausea.*
     - **Tension-type headache:** Characterized as a dull, squeezing, or tightening pain that is milder than migraine and associated with ***ONLY ONE*** of the following features: *photophobia, phonophobia,* ***OR*** *nausea*. A common misconception is that neck pain/stiffness or psychological stress is required for the diagnosis.
   - **Secondary headache** typically occurs due to an outside factor that can be reversible. (*Ref. - 7*)
     - Trauma or injury to the head or neck - acute or persistent pattern, can have presence of whiplash
     - Vascular Disorder (stroke, aneurysm, vascular AVM, hemorrhage, arteritis, venous thrombosis)
     - Non-vascular disorder (high/low CSF pressure, brain tumor, epilepsy, chiari malformation)
     - Infection (systemic or intracranial - meningitis/ encephalitis)
     - Psychiatric disorder (somatization disorder, psychotic disorder)

Pediatric Migraine

ICHD criteria for migraine without aura (*Ref. - 7*)
Must meet at least 5 of the following criteria:

- Headache lasting 2–72 hours (when untreated or unsuccessfully treated)
- Headache location may be unilateral or bilateral
- Headache is moderate to severe intensity
- Throbbing or pulsating in nature
  - Associated features:
    - Nausea and/or vomiting
    - Photophobia aka light sensitivity (child may hide under blankets with screens) or photophobia aka sound sensitivity (child may complain of loud sounds

Assessment

History taking: Making an accurate diagnosis relies on a detailed history and physical exam. Headaches with a stable pattern, location, and associated features >6 months is generally reassuring against secondary headache. (*Ref. - 8*)

Key questions:

- Onset
- Pattern: Changes in frequency or intensity
- Headache location and description
- Associated non-pain features
- Headache duration
- Alleviating and aggravating factors
- Degree of disability: Missed days of school or activities, urgent care/ED visits

Red flags

Red flag signs are seen with secondary headache.

Key questions:

- Worst headache of child's life
- Headaches causing one to wake up from sleep
- Diplopia aka double vision
- Thunderclap onset (severe intensity at the start)
- Headache triggered with straining or exercise
- Change in patient's usual pattern or location
- Headache not resolving from multiple medications

- Systemic symptoms: fever, weight loss
- Neurologic symptoms or abnormal signs (impaired alertness or consciousness, confusion, visual or speech changes, changes in coordination or walking)
  - Onset: sudden and severe headache at the start
  - Previous headache history with new headache characteristics marked by changes in attack frequency, severity, or clinical features

Physical exam

- A full neurological exam is helpful on initial encounter with examination of mental status, speech, cranial nerves, motor, sensory, reflexes, coordination, and gait.
- Signs of increased intracranial pressure
  - Fundoscopic exam: papilledema
  - Extraocular movements: 6th nerve cranial palsy is the most common finding with limitations in lateral eye movements and double-vision
- Visual field testing: test visual acuity with one eye closed and ability to count fingers in different quadrants

Imaging

- Is not typically indicated unless your history has red-flag symptoms, unstable headache pattern, or abnormal neurological examination.
  - If a pediatric patient has a normal exam and stable migraine pattern for at least 6 months, you are more likely to have normal imaging.
  - In a prospective study of 314 pediatric participants, 39 (12%) had occipital headaches that most commonly were caused, not by intracranial lesions, but by viral syndromes and primary headaches disorders, such as migraine. (*Ref. - 9*)
- If imaging is needed, MRI brain without contrast is indicated over CT head.
- CT scan is best used in cases of acute injury or in the ED setting.

When to refer

- Migraine lasting >72 hours aka status migrainosus
- Thunderclap headache (peak intensity in 60 seconds or less)
- Worst headache ever
- New onset intractable vomiting upon awakening
- Abnormal neurological examination
- Provider's concerns (fever in immunocompromised patient, etc.)

Management/treatment

Healthy Habits: Follow SMART

Sleep: Keep sleep and awake times consistent and limit screen time before bed. Limit naps.
Meals and hydration: Eat at least 3 meals a day and snack as needed
Activity: Aim for 30 minutes of activity 3–5 days per week
Relaxation: Screen for depression/anxiety
Triggers: Keep a headache log and track responses

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Preventative medications: Plan for 2–3 months for full effect

- Combination/supplement: Vitamin B2, Magnesium, Coenzyme q10, and or feverfew. Avoid butterbur.
- Cyproheptadine: Preferred in <13 years. Avoid in obesity. Advise on increased appetite. Dosed 2 to 4 mg at bedtime.
- Amitriptyline: Preferred in patients with insomnia. Avoid in patients who are severely depressed or with history of suicidal thoughts. Dosed at 0.5-1 mg/kg with up to 50 mg at night.
- Propranolol: Preferred in anxiety. Avoid in severe asthmatics. Dosed at 10 or 20 mg at night, can be increased as tolerated.
- Topiramate: Preferred in obesity. Avoid in ADHD. This is the only daily preventative that is FDA approved in pediatrics. Dosed at 25-100 mg nightly.
    - Acute medicines: Needs to have similar access when at home and at school. Goal of acute medications is to resolve headache within 1 hour without side effect.
        - Over-the-counter: Tylenol, Ibuprofen, Naproxen. Avoid products that contain Aspirin and Caffeine.
        - Non-specific: Metoclopramide, Prochlorperazine, Promethazine
        - Migraine-specific: Triptans, Gepants
    - Tablets: Sumatriptan, Rizatriptan, Zolmitriptan, Eletriptan, Almotriptan, Ubrogepant
    - Intranasal: Sumatriptan, Zolmitriptan
    - Dissolvable: Rizatriptan (mint), Zolmitriptan (orange), Rimegepant (mint)

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