Program Objectives

- Identify and triage red flags for pediatric headaches
- Select appropriate imaging modalities and other neurodiagnostic studies when indicated
- Begin first-line prophylactic and abortive therapies

Why is this important?

- Headaches represent a major neurological disability
- Child neurology remains an underserved subspecialty
- Some secondary headaches are neurological emergencies
- Evidence-based clinical practice guidelines are available

Primary vs. Secondary Headaches

- Primary: no particular underlying cause
  - Migraines, tension-type, trigeminal autonomic cephalalgias
- Secondary: clear underlying reason
  - Concussion, pseudotumor cerebri, infection, epilepsy, medications, seasonal allergies, vision problems, bruxism/snoring, aneurysms, Chiari, substances, hypertension

Epidemiology

- Headaches at some point:
  - 50% of 7 year olds, 80% of 15 year olds
- Primary headache disorders
  - 5% of 5 year olds, 10% of 10 year olds, 15% of 15 year olds and adults
  - <5% of all headaches are due to a serious underlying etiology
- <1% of brain tumors present with headache ALONE
  - The majority will have 5+ abnormalities on neurological examination

Victor et al Cephalalgia 2010
History and Physical

• HPI: location, onset, duration, frequency, intensity, character, associated symptoms, alleviating/aggravating factors, timing, position
  • Photo/phonophobia, nausea, vomiting, visual changes, paresthesias, weakness
• Review of systems
• Past medical history
• Family history
• Social history
• Headache hygiene

History and Physical Red Flags

• HPI:
  • Thunderclap, sudden change in previous pattern, positional quality, any subjective neurological symptoms, awakening out of sleep, early morning a.m.
  • <6 years of age + neurological symptoms and/or occipital location
  • <3 years of age
• ROS: systemic signs, seizures, apnea
• PMH: epilepsy, sickle cell disease, closed head injury, malignancy
• FH: aneurysms, epilepsy
• SH: nonaccidental trauma

Neuroimaging

• Not needed if stable pattern for 6 months
• If normal neurodevelopmental history and examination
• Counseling families
• Who, what, where, when, how?
• MRI > CT
• Incidentalomas: 10%
  • Cerbellar ectopia, arachnoid cysts, pineal cysts, paranasal sinus disease, white matter lesions, developmental venous anomalies, Virchow Robin spaces

Primary Headache Disorders

• Migraine
  • with or without aura, with or without status migrainosus, variants
  • Chronic vs. episodic
  • Intractability
• Tension-Type
• Trigeminal autonomic cephalgia
  • Examples: cluster, SUNA/SUNCT, hemicranias continua, paroxysmal hemicrania
• Others
  • Ex: cough, coital, exercise-induced, nummular, hyponic, cold-stimulus, etc.
Pathophysiology

- Cortical spreading depression theory
- Electrical changes
- Chemical disturbances
- Vascular tone changes
- Histaminergic response

Migraines

- Most common
- Moderate-severe pain
- Unilateral or bilateral
- Throbbing, pounding, pulsating
- Aggravated by physical exertion
- Last for hours
- Associated photo- and phonophobia, nausea and vomiting
- With (15%) or without (85%) aura

Abortive Medications

- 60% of children are never prescribed a medication
- 1/5 are given a narcotic
- Take at symptom onset, no more than 2-3 times per week
- NSAIDs
- Antiemetics
- Triptans
- Steroids
- Antiepileptic drugs
- Nerve blocks: supraorbital, temporoauricular, greater occipital

Abortive Medications

- Children's Mercy 2016

Abortive Medications

- Gould et al AAN 2013

Abortive Medications

- Children's Mercy 2016

Abortive Medications

- Gould et al AAN 2013
Abortive Medications

Preventative Medications

• 
• Not responding to abortives
• Accompanying neurological symptoms
• Marked occupational impairment
• Goal: decrease severity and intensity
  • <10% achieve complete headache freedom

Preventative Medications

• Magnesium
• Riboflavin (vitamin B2)
• Topiramate, valproic acid
• Amisulpride, nortriptyline, SSRIs
• Beta blockers
• Cyproheptadine
• Indomethacin
• Tizanidine
• Others: botulinum toxin injections, CGRP-antagonists

Non-pharmacological Treatments

• Transcutaneous electrical stimulation
• Acupuncture, acupressure
• Neurobiofeedback
• Massage
• Physical therapy
• Aromatherapy
• Cognitive behavioral therapy

When to Refer

• Any red flags
• Not responding to interventions
• Phone consultation
• Telemedicine services
• Outreach clinics