

CHILDREN WITH HEADACHES

Differential Diagnosis for the Optometrist

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- None

Case Examples to Set the Stage

Pediatric Headaches Clinical Significance

- Most prominent impairment affecting school and emotional functioning
- 3rd leading cause of school absence (2x missed school days)
- Impact on QOL (PedsQL) – similar to chronic conditions such as rheumatoid disease or cancer
- 20% school-age kids have chronic HA's

Powers et al. Pediatrics 2003; 112:1-5.
National Headache Foundation: 2002
www.headaches.org

Prevalence of Pediatric HAs

By age:

- 3 years: 3-8%
- 5 years: 19.5%
- 7 years: 37-51%
- 15 years: 75%

Abu-Arefeh & Russel. Br Med J 1994;309:765-9.
Bille. Acta Paediatr Scand 1962;51:1-151.

Course Objectives

Review characteristics & diagnosis of
following childhood headaches:

- Migraine*
- Tension*
- Organic
- Visually-related

* Most common

Headache: Optometric Evaluation

- Comprehensive History
- Comprehensive Eye Examination

Headache Comprehensive History

1. Investigate headache itself
2. General medical history; academic performance; queries regarding anxiety, tension, depression
3. Symptoms of increased intracranial pressure or progressive neurological disease
 - Coordination problems, lethargy, seizures, visual disturbances, focal weakness, personality change, balance difficulties

Headache History

- Do you have the same kind of HA all the time or do you get more than 1 kind of HA?
- How long have you had HAs? How & when did they start?
- How often do you get HAs? How long do they usually last?
- Do you get HAs at any certain time? What time of the day generally? Any pattern? Weekends?
- Worse, better, or the same?
- Where is the pain? (location) What does the pain feel like? (pounding, squeezing, stabbing, other?)
- Other parts of your body involved when you have a HA? (nausea, vomiting, dizziness, vision changes, numbness, weakness or other symptoms?)

Headache History

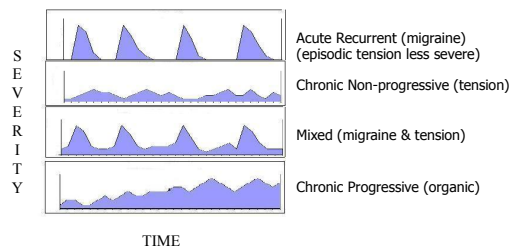
- Do you wake up at night or in the morning with HAs?
- Any warning signs that a HA is about to start?
- What do you do when you get a HA? Do you have to stop what you are doing (playing, working, studying)?
- Anything special cause you to get a HA?
- What helps your HA feel better or worse? Anything you do that makes your HA worse? Does taking medicine or eating foods give you a HA or make a HA worse?
- Taking any medicines for your HAs or for other reasons?
- Any other health problems or allergies?
- Anyone else in your family get HAs?
- What do you think might be causing your HAs?

Identify the HA Pattern

Classification of Temporal Pattern

- Acute HA: single episode without history of previous similar event
- Acute-recurrent HA: pattern of HA separated by symptom-free intervals
- Chronic-progressive HA: gradual increase in frequency & severity over time* **most ominous*
- Chronic-nonprogressive HA: frequent or constant
- Mixed HA: acute recurrent superimposed on chronic non-progressive

Headaches: Temporal Patterns



HA: Optometric Evaluation

- Comprehensive History
- Comprehensive Eye Examination

Eye-Related Headaches

- Uncorrected or miscorrected ametropia*
- Eye alignment/vergence disorder
 - CI, CE, int strabismus, verticals
- Accommodative dysfunction
 - Insufficiency, excess
- Mild HA's in frontal region / around eyes
- Pain absent upon awakening but aggravated by prolonged visual tasks
- Often not present weekends/holidays



*HA Classification Committee of Intl HA Society. Cephalalgia 1988;8:1-96.

Eye Examination

- Visual acuity
- Cycloplegic refraction
- Eye Alignment
 - Cover testing & EOM's
 - Look for vertical deviation
- Vergence (NPC, PFV, NFV)
- Accommodation (amps & accuracy/lag)
- Pupils, VF, ant/post segs (ONH), IOP

Non Eye-Related Headaches to Rule Out in Children

- Organic (chronic progressive)
- Migraine (acute recurrent)
- Tension
 - Acute recurrent
 - Chronic non-progressive
- Others

Organic Headache

- Chronic progressive
- ↑ in severity & frequency over several months
- Often from increased intracranial pressure (IICP)
 - Cerebral tumor*
 - Hydrocephalus
 - Subdural hematoma
 - Brain abscess
 - Pseudotumor cerebri

Brain Tumor Causing HA

- HA from IICP from mass itself or obstruction of CSF
- Chronic-progressive
- Tends to be worse in morning
- Pain usually dull & steady; can be throbbing
- Often accompanied by vomiting
- Pain worse with coughing, straining, laying down
- Sometimes dizzy
- Diplopia, if palsy develops

Child With Brain Tumor Presenting With HA Complaint

- Likely: ≥ 1 other symptom & ≥ 1 neurologic sign
- $\geq 50\%$ kids have ≥ 5 neurologic deficits
- $<1\%$ kids have no other symptoms other than HA

Childhood Brain Tumor Consortium J Neuro-Oncol 1991;10:31-46.

Symptoms of IICP

- Lethargy
- Balance difficulty
- Personality change
- Focal weakness
- Seizures
- Loss of consciousness
- Coordination difficulties
- Nausea / vomiting
- Diplopia

Headaches in Children

- Any child presenting with chronic progressive HA should be referred for neurological workup
- Any child presenting with HA found to have neurological signs on clinical examination requires neuroimaging

Childhood Brain Tumor Consortium J Neuro-Oncol 1991;10:31-46

Symptoms Requiring Close Examination: Related to Secondary HA

- Attacks more severe, lengthy, or frequent
- Changes in child's personality or behavior
- Pain not diminished by mild pain-killing drugs
- Acute onset, assoc w/ neck stiffness, lethargy, & vomiting
- Wakes child at night and there is morning HA
- Caused by cough, sneezing, straining, recumbence, sleep
- Abnormal signs on exam; visual or neurologic symptoms
- Occipital HA's uncommon in children; may be organic

Guidetti & Galli. Seminars in Pain Medicine 2004;2: 106-14.

Pediatric Migraine Clinical Features

- Duration 1-72 hrs; can be *bilateral* in children
- Relief after sleep: 94%
- Throbbing, pounding quality: 58%
- Nausea, vomiting, abdominal pain: 90%
- Family history of migraine: 69%
- Moderate to severe intensity
- Aggravated by physical activity
- Aura: 10-20% (usually visual for 5-10 min)
- Photophobia +/- phonophobia

Prevalence of Migraine HA in Children

Most common form of acute recurrent HA

- 3-7 years: 1-3% boys > girls
- 7-11 years: 4-11% boys = girls
- 15 years: 8-23% boys < girls

Lipton et al. Headache 1994;34:319-28.
Stewart et al. Am J Epidemiol 1991;134:1111-20.

Common Migraine Causes

- Hormonal
- External triggers
- Dietary

Common External Triggers

- Skipped meals
- Disrupted sleep (excessive or lack of)
- Analgesic overuse (rebound HA's)
- Bright lights
- Weather patterns
- Odors
- Stress / anxiety
- High altitude, airplane travel
- Birth control pills

uhs.berkeley.edu/home/healthtopics/pdf/triggers.pdf

Common Dietary Triggers

- Aged or strong cheese*
- Chocolate* nuts, yeast
- Alcoholic drinks (red wine, beer, sherry)
- Monosodium glutamate (MSG)
- Cultured dairy products (sour cream), choc milk/ice cream
- Caffeine-containing drinks (coffee, tea, "cola" drinks)
- Beans (lima, Italian, lentil, soy, pinto, navy, peas)
- Freshly baked yeast bread, doughnuts, coffeecake; choc cake
- Pizza, mac & cheese, frozen TV dinners, olives, pickles
- Citrus fruits, ripe banana, avocado

uhs.berkeley.edu/home/healthtopics/pdf/triggers.pdf

Common Dietary Triggers

- Aspartame, nitrites, sulfites, meat tenderizer (Accent)
- Anything fermented, pickled, or marinated
- Processed/preserved, aged, canned meats (hot dogs, sausage, bacon, ham, salami, luncheon meats)
- Any food prepared with meat tenderizer, soy sauce, or brewer's yeast
- Pickled herring, chicken livers, sauerkraut, sardines, anchovies
- Canned soup or bouillon cubes
- Food dyes, additives

Diagnostic Criteria for Migraine in Children

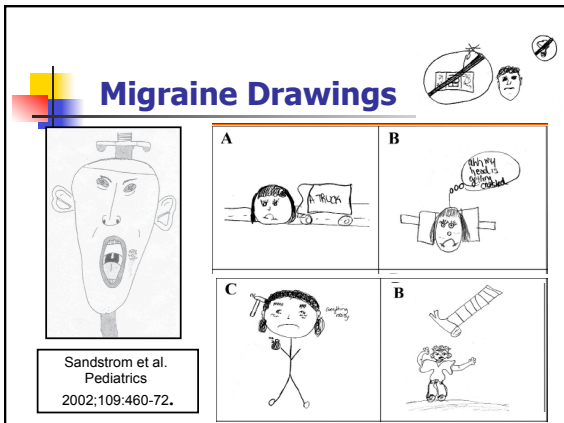
- ≥ 5 attacks of 1-72 hrs with at least 2 features:
 - Bi/unilateral frontal/temporal location
 - Pulsating/throbbing quality
 - Moderate to severe intensity
 - Exacerbation with physical activity
- Accompanied ≥ 1 :
 - Nausea +/- vomiting
 - Photophobia +/- phonophobia

International Headache Society:
http://ihs-classification.org/en/02_klassifikation/02_tell1/01.01.00_migraine.html

Distinguishing Features Migraine vs. Tension HA

- Pain intensity
- Aggravation with physical activities
- Vomiting

Wober-Bingol et al. Headache 1996;36:231-8.



Tension-type Headache

- Most common pediatric HA esp >12yrs
- Account for ~75% frequent HA's in kids
- Muscle contraction, tension
- No organic etiology
- Etiologies: stress, depression, trauma

- Daily headaches wax & wane, or several times per week
- Episodic-tension HA

Tension-type Headache

- Bilateral location
- Pressing/tightening/band-like (nonpulsating)*
- Mild to moderate intensity*
- Not aggravated by routine physical activity such as walking or climbing stairs
- No vomiting
- No more than one of photophobia or phonophobia or mild nausea
- Not attributed to another disorder

Summary

Common Headaches in Children

- Eye or vision-related
- Organic (chronic progressive)
- Migraine (acute recurrent)
- Tension
 - Acute recurrent
 - Chronic non-progressive

Ddx: Case History & Vision Examination

Cases Reports

- Differential diagnosis

Visually-Related Headache in a Preschooler

	Pre SRx	Post SRx
+1.50 D OU		
Headaches	Yes	None
Phoria	3Δ EP	4Δ XP
MEM	+2.00 D	+0.50 D
Stereopsis	143"	45"

Hutter & Rouse. *Am J Optom & Physiol Opt*, 1984

Misc Adult Migraine Info

Primary Care Screening Test for Migraine

ID Migraine™

- Has a HA limited your activities for ≥ 1 day in last 3 months?
- Are you nauseated or sick to your stomach when you have a HA?
- Does light bother you when you have a HA?

Lipton et al. Neurology 2003;61:375-82.

Primary Care Screening Test for Migraine

ID Migraine™

- Photophobia
- Inability to function
- Nausea

Probability of migraine
Yes on 2/3 = 81%
Yes on 3/3 = 93%

Lipton et al. Neurology 2003;61:375-82.

Adult Migraine Dx: POUNDing

3 or 4 Criteria: high sensitivity/specificity

- Pulsating quality
- hOurs Duration: 4-72
- Unilateral location
- Nausea or vomiting
- Disabling intensity (disrupts daily activities)
-ing

Detsky et al. JAMA 2006;296:1274-83.

Adult Migraine Diagnosis

A bad 1-sided HA that pounds & is worsened by light & by sounds & throwing up all over the ground

Thank you



Comprehensive Case History for Headaches

- How long have you had headaches? _____ How and when did they start? _____

- How often do you get headaches? _____ How long do they usually last? _____
- Are the headaches getting worse than they used to be, better, or staying the same? _____
- Do you have the same kind of headache all of the time or do you get more than one kind of headache? _____ -

- Where is the pain (location)? _____
- What does the pain feel like? (pounding, squeezing, stabbing, other?) _____
- _____
- Are other parts of your body involved when you have a headache? (e.g., nausea, vomiting, dizziness, vision changes, numbness, weakness or other symptoms?) _____

- What do you do when you get a headache? _____
- Do you have to stop what you are doing (playing, working, studying)? YES _____ NO _____
- What helps your headache feel better or worse? Is there anything you do that makes your headache worse?

- _____
- Does taking medicine or eating foods give you a headache or make a headache worse? _____

- Is there anything special that causes you to get a headache? _____
- _____
- Do you get headaches at any certain time? What time of the day generally? Any pattern? On weekends?

- Do you wake up at night or in the morning with headaches? NO YES _____
- Do you have any warning signs that a headache is about to start? NO YES: explain _____

- Are you taking any medicines for your headaches or for other reasons? NO YES: list _____

- Do you have any other health problems or allergies? NO YES: _____

- Does anyone else in your family get headaches? NO YES: who and what kind? _____

- What do you think might be causing your headaches? _____

Daily Diary

Date of headache: _____

Type of headache: migraine tension-type other: _____

	Comment
Description of prodrome (symptoms prior to onset of pain)	
Presence of aura	
Time of headache onset	
Severity of worst pain (0=no pain; 10=severe pain)	
Symptoms (eg. nausea, vomiting, photophobia, throbbing, disability)	
Medication 1 taken	Type of medicine: Dose: Time of dose:
Medication 2 taken	Type of medicine: Dose: Time of dose:
Time of headache relief	
Noted triggers or factors that may cause headache (eg. caffeine, menstruation, fasting, sleep deprivation, other)	
Other comments	
Questions about your headache or medication	

Migraine Triggers

“Triggers” are specific factors that may increase your risk of having a migraine attack. The migraine sufferer has inherited a sensitive nervous system that under certain circumstances can lead to migraine.

Triggers do not ‘cause’ migraine. Instead, they are thought to activate processes that cause migraine in people who are prone to the condition. A certain trigger will not induce a migraine in every person; and, in a single migraine sufferer, a trigger may not cause a migraine every time. By keeping a headache diary, you will be able to identify some triggers for your particular headaches.

Once you have identified triggers, it will be easier for you to avoid them and reduce your chances of having a migraine attack.”

—American Council for Headache Education

Categories	Triggers	Examples
Dietary	Skiping meals/fasting Specific foods Medications	<i>See reverse</i> Overuse of over-the-counter medications can cause rebound headaches (e.g. using ibuprofen, Excedrin Migraine more than 2 days per week). Also, missed medication doses and certain medications (e.g. nitroglycerine, indomethacin) may cause headaches.
Sleep	Changes in sleep patterns	Napping, oversleeping, too little sleep
Hormonal	Estrogen level changes and fluctuations	Menstrual cycles, birth control pills, hormone replacement therapies, peri-menopause, menopause, ovulation
Environmental	Weather Bright lights Odors/pollution Other	Weather and temperature changes, extreme heat or cold, humidity, barometric pressure changes Bright or glaring lights, fluorescent lighting, flashing lights or screens Smog, smoke, perfumes, chemical odors High altitude, airplane travel
Stress	<ul style="list-style-type: none">▪ Periods of high stress, including life changes▪ Accumulated stress▪ Reacting quickly and easily to stress▪ Repressed emotions	Factors related to stress include anxiety, worry, shock, depression, excitement, mental fatigue, loss and grief. Both “bad stress” and “good stress” can be triggers. How we perceive and react to situations can trigger (or prevent) migraines. Other triggers can include unrealistic timelines or expectations of oneself.
Stress letdown		Weekends, vacations, ending a project or stressful task (including presentations, papers, or exams)
Physical	Overexertion Injuries Visual triggers Becoming tired or fatigued	Over-exercising when out of shape, exercising in heat, marathon running Eyestrain (if you wear glasses, make sure your prescription is current), bright or glaring lights, fluorescent lighting, flashing lights or computer screens

Dietary Triggers

Food triggers do not necessarily contribute to migraines in all individuals, and particular foods may trigger attacks in certain people only on occasion. Be your own expert by keeping a journal of foods you have eaten before a migraine attack and see whether the removal or reduction of certain foods from your diet improves your headaches.

Skipping meals, fasting, and low blood sugar can also trigger migraines. If you're unable to follow a normal eating schedule, pack snacks.

Food item	Not known to trigger migraines	Possible triggers
Beverages	Fruit juice, club soda, noncola soda (7-Up, gingerale), decaffeinated coffee, herbal tea, soy milk, rice milk. Limit caffeine sources to 2 cups/day (coffee, tea, cola).	Chocolate and cocoa. Alcoholic beverages (especially red wine, beer, and sherry). Caffeine (even in small amounts) may be a trigger for some people.
Fruits	Any except those to avoid. Limit citrus fruits to ½ cup/day. Limit banana to ½ per day.	Figs, raisins, papayas, avocados (especially if overripe), red plums, overripe bananas.
Vegetables	Any except those to avoid.	Beans such as broad, fava, garbanzo, Italian, lima, navy, pinto, pole. Sauerkraut, string beans, raw garlic, snow peas, olives, pickles, onions (except for flavoring).
Bread & Grains	Most commercial breads, English muffins, melba toast, crackers, RyKrisp, bagel. All hot and dry cereals. Grains such as rice, barley, millet, quinoa, bulgur. Corn meal and noodles.	Freshly baked yeast bread. Fresh yeast coffee cake, doughnuts, sourdough bread. Breads and crackers containing cheese, including pizza. Any product containing chocolate or nuts.
Dairy Products	Milk (2% or skim). Cheese: American, cottage, farmer, ricotta, cream, Velveeta. Yogurt: (limit to ½ cup per day).	Cultured dairy products (buttermilk, sour cream). Chocolate milk. Cheese: blue, brick (natural), Gouda, Gruyere, mozzarella, Parmesan, provolone, romano, Roquefort, cheddar, Swiss (emmentaler), Stilton, Brie types and Camembert types.
Meat, fish, poultry	Fresh or frozen turkey, chicken, fish, beef, lamb, veal, pork. Egg (limit to 3 eggs/week). Tuna or tuna salad.	Aged, canned, cured or processed meat, including ham or game, pickled herring, salted dried fish, sardines, anchovies, chicken livers, sausage, bologna, pepperoni, salami, summer sausage, hot dogs, pâté, caviar. Any food prepared with meat tenderizer, soy sauce or brewer's yeast. Any food containing nitrates, nitrites, or tyramine.
Soups	Soups made from foods allowed in diet, homemade broths.	Canned soup, soup or bouillon cubes, soup base with autolytic yeast or MSG. <i>Read labels.</i>
Desserts	Fruit allowed in diet. Any cake, pudding, cookies, or ice cream without chocolate or nuts. JELL-O.	Chocolate ice cream, pudding, cookies, cakes, or pies. Mincemeat pie. Nuts. Any yeast-containing doughs and pastries.
Sweets	Sugar, jelly, jam, honey, hard candy	
Miscellaneous	Salt in moderation, lemon juice, butter or margarine, cooking oil, whipped cream, and white vinegar. Commercial salad dressings in small amounts as long as they don't have additives to avoid.	Nutrasweet, monosodium glutamate (MSG), yeast/yeast extract, meat tenderizer (Accent), seasoned salt, mixed dishes, pizza, cheese sauce, macaroni and cheese, beef stroganoff, cheese blintzes, lasagna, frozen TV dinners, chocolate. Nuts and nut butters. Pumpkin, sesame and sunflower seeds. Anything fermented, pickled or marinated. Some aspirin medications that contain caffeine. Excessive amounts of Niacin (Niacinamide is fine). Excessive Vitamin A (over 25,000 I.U. daily).

Weekly Diary

Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Dates							
Prodrome							
Aura							
Time of pain onset							
Severity of pain							
Treatment 1 (dose)							
Symptoms (nausea, throbbing, disability)							
Treatment 2 (dose)							
Treatment 3 (dose)							
Time to pain relief							
Noted triggers (caffeine, menses, etc.)							
Type of headache (migraine, tension)							
Other comments or questions							