Children With Headaches
Differential Diagnosis for the Optometrist

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Course Objectives
Pediatric Headaches

- Background / Prevalence
- Differential diagnosis
  - Migraine*
  - Tension*
  - Organic
  - Visually-related

* Most common

Pediatric Headaches
Clinical Significance

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

National Headache Foundation: 2002
www.headaches.org

Financial Disclosures

- No commercial relationships

Case Examples: Food for Thought

Prevalence of Pediatric Headache

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

### Headache: Optometric Evaluation

- Comprehensive History
- Comprehensive Eye Examination

### Headache Comprehensive History

1. 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

- Same kind of HA all the time or >1 kind of HA?
- How long been getting HA? How & when start?
- Worse, better, or the same?
- Frequency & How long usually last?
- Any pattern? What time of day generally? Weekends?
- Where is pain?
- What does pain feel like? (pounding, squeezing, stabbing, other?)
- Other parts of body involved when have a HA? (nausea, vomiting, dizziness, vision changes, numbness, weakness or other symptoms?)

### Identify the Temporal Pattern

- Acute Recurrent (migraine)
- (Episodic tension less severe)
- Chronic Non-progressive (tension)
- Mixed (migraine & tension)
- Chronic Progressive (organic)


### Eye-Related Headaches

- Uncorrected / miscorrected ametropia*
- Eye alignment/vergence disorder
- Accommodative dysfunction
- Mild / in frontal region / around eyes
- Absent upon awakening
- Associated with prolonged visual tasks

**Eye Examination**
- Visual acuity
- Cycloplegic refraction
- Eye Alignment
  - Cover test & EOM’s
  - Vertical deviation?
- Vergence
- Accom amps & accuracy
- Eye Health
  - Pupils, VF, IOP
  - Ant/post segs (ONH)

**Non Eye-Related Headaches to Rule Out in Children**
- Organic (chronic progressive)
- Migraine (acute recurrent)
- Tension
  - Acute recurrent
  - Chronic non-progressive
- Others

**Organic Headache**
- Often increased intracranial pressure (IICP) from tumor itself or CSF blockage
  - Cerebral tumor*
  - Hydrocephalus
  - Subdural hematoma
  - Brain abscess
  - Pseudotumor cerebri

**Symptoms Requiring Close Examination: Related to Organic HA**
- More severe, lengthy, or frequent; chronic progressive
- Pain dull/steady; can be throbbing; not diminished by mild pain-killing drugs
- Acute onset, assoc w/ neck stiffness, lethargy, & vomiting
- Wakes child at night and there is morning HA
- Worse with cough, sneeze, strain, recumbence, sleep
- Changes in child’s personality or behavior
- Abnormal signs on exam; visual or neurologic symptoms**
  - Occipital HA’s uncommon in children; may be organic

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

**Child With Brain Tumor Presenting With HA Complaint**
- Likely: ≥ 1 other symptom & ≥ 1 neurologic sign
- ≥ 50% kids have ≥5 neurologic deficits
- <1% kids have no other symptoms other than HA

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Headaches in Children

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

**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 +/- or 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

**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

**Common Dietary Triggers**

- Aged or strong cheese*
- Chocolate* nuts, yeast
- Alcoholic drinks (red wine, beer)
- Monosodium glutamate (MSG)
- Processed/preserved meats (hot dogs, sausage, bacon, ham, salami, luncheon meats)
- Caffeine-containing drinks (coffee, tea, all “cola” soft drinks)
- Dairy products
- Beans (lima, Italian, lentil, soy, peas)
Common Dietary Triggers

- Aspartame, nitrites, sulfites
- Fatty or fried foods
- Dried meats/smoked foods
- Food dyes, additives
- Chicken livers, sauerkraut
- Meat and vegetable extracts
- Pork, seafood
- Citrus fruits, ripe banana, avocado
- Anchovies
- Ice cream

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_teil1/01.01.00_migraine.html

Distinguishing Features
Migraine vs. Tension HA

- Pain intensity
- Aggravation with physical activities
- Vomiting

Migraine Drawings

- Sandstrom et al.

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

1. Daily headaches wax & wane, or several times per week
2. Episodic-type

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

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?


Primary Care Screening Test for Migraine
ID Migraine™
- Photophobia
- Inability to function (disrupts daily activities)
- Nausea

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


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

Thank you

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## 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?**

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**Susan Cotter, OD, MS**

**Headaches in Kids**
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

<table>
<thead>
<tr>
<th>Categories</th>
<th>Triggers</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary</td>
<td>Skipping meals/fasting</td>
<td>See reverse</td>
</tr>
<tr>
<td></td>
<td>Specific foods</td>
<td>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.</td>
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<tr>
<td></td>
<td>Medications</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>Changes in sleep patterns</td>
<td>Napping, oversleeping, too little sleep</td>
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<tr>
<td>Hormonal</td>
<td>Estrogen level changes and fluctuations</td>
<td>Menstrual cycles, birth control pills, hormone replacement therapies, peri-menopause, menopause, ovulation</td>
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<tr>
<td>Environmental</td>
<td>Weather</td>
<td>Weather and temperature changes, extreme heat or cold, humidity, barometric pressure changes</td>
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<td></td>
<td>Bright lights</td>
<td>Bright or glaring lights, fluorescent lighting, flashing lights or screens</td>
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<td></td>
<td>Odors/pollution</td>
<td>Smog, smoke, perfumes, chemical odors</td>
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<td></td>
<td>Other</td>
<td>High altitude, airplane travel</td>
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<tr>
<td>Stress</td>
<td>Periods of high stress, including life changes</td>
<td>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.</td>
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<tr>
<td></td>
<td>Accumulated stress</td>
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<td></td>
<td>Reacting quickly and easily to stress</td>
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<tr>
<td></td>
<td>Repressed emotions</td>
<td></td>
</tr>
<tr>
<td>Stress letdown</td>
<td>Weekends, vacations, ending a project or stressful task (including presentations, papers, or exams)</td>
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</tr>
<tr>
<td>Physical</td>
<td>Overexertion</td>
<td>Over-exercising when out of shape, exercising in heat, marathon running</td>
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<tr>
<td></td>
<td>Injuries</td>
<td></td>
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<tr>
<td></td>
<td>Visual triggers</td>
<td>Eyestrain (if you wear glasses, make sure your prescription is current), bright or glaring lights, fluorescent lighting, flashing lights or computer screens</td>
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<tr>
<td></td>
<td>Becoming tired or fatigued</td>
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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.

<table>
<thead>
<tr>
<th>Food item</th>
<th>Not known to trigger migraines</th>
<th>Possible triggers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverages</td>
<td>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).</td>
<td>Chocolate and cocoa. Alcoholic beverages (especially red wine, beer, and sherry). Caffeine (even in small amounts) may be a trigger for some people.</td>
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<tr>
<td>Fruits</td>
<td>Any except those to avoid. Limit citrus fruits to ½ cup/day. Limit banana to ½ per day.</td>
<td>Figs, raisins, papayas, avocados (especially if overripe), red plums, overripe bananas.</td>
</tr>
<tr>
<td>Vegetables</td>
<td>Any except those to avoid.</td>
<td>Beans such as broad, fava, garbanzo, Italian, lima, navy, pinto, pole. Sauerkraut, string beans, raw garlic, snow peas, olives, pickles, onions (except for flavoring).</td>
</tr>
<tr>
<td>Bread &amp; Grains</td>
<td>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.</td>
<td>Freshly baked yeast bread. Fresh yeast coffee cake, doughnuts, sourdough bread. Breads and crackers containing cheese, including pizza. Any product containing chocolate or nuts.</td>
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<tr>
<td>Dairy Products</td>
<td>Milk (2% or skim), Cheese: American, cottage, farmer, ricotta, cream, Velveeta. Yogurt: (limit to ½ cup per day).</td>
<td>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.</td>
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<tr>
<td>Meat, fish, poultry</td>
<td>Fresh or frozen turkey, chicken, fish, beef, lamb, veal, pork. Egg (limit to 3 eggs/week). Tuna or tuna salad.</td>
<td>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.</td>
</tr>
<tr>
<td>Soups</td>
<td>Soups made from foods allowed in diet, homemade broths.</td>
<td>Canned soup, soup or bouillon cubes, soup base with autolytic yeast or MSG. <strong>Read labels.</strong></td>
</tr>
<tr>
<td>Desserts</td>
<td>Fruit allowed in diet. Any cake, pudding, cookies, or ice cream without chocolate or nuts. JELL-O.</td>
<td>Chocolate ice cream, pudding, cookies, cakes, or pies. Mincemeat pie. Nuts. Any yeast-containing doughs and pastries.</td>
</tr>
<tr>
<td>Sweets</td>
<td>Sugar, jelly, jam, honey, hard candy</td>
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<tr>
<td>Miscellaneous</td>
<td>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.</td>
<td>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).</td>
</tr>
</tbody>
</table>