General Pediatric Cases

Joseph Gigante
Professor of Pediatrics
Vanderbilt University School of Medicine

Special thanks to Dr’s. Abhay Dandekar (UCSF) and Joanne Cox (Boston Children’s)
Disclosure

• I have no relevant financial relationships with the manufacturers of any commercial products or provider of commercial services discussed in this CME activity.

• I do not intend to discuss an unapproved/investigative use of a commercial product/device in my presentation.

• Special thanks to Dr’s. Abhay Dandekar (UCSF) and Joanne Cox (Boston Children’s) for the slides
Case #1

You are seeing a 19 month old fully immunized boy who has had a runny nose and slight cough for the last 3 days. He has become more fussy, isn’t sleeping well. On exam he is well appearing and afebrile. His right tympanic membrane is bulging and red. His left TM is normal. His PMH is negative with no recent antibiotic use.

1. What is your diagnosis?
What are the key diagnostic criteria?

• Confirmation by pneumatic otoscopy **
• Distortion, usually bulging of TM
• Restricted movement of TM
• Erythema alone is NOT sufficient (may be 2° to fever or crying)
• Tympanocentesis or carbon dioxide laser-assisted myringotomy if recovery of organism is needed (not routine)
## What are the risk factors for AOM? **

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Other Predisposing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tobacco exposure</td>
<td>1. Craniofacial abnormalities</td>
</tr>
<tr>
<td>2. Use of pacifier</td>
<td>2. Allergic rhinitis</td>
</tr>
<tr>
<td>3. Not breastfeeding</td>
<td>3. Immunodeficiencies</td>
</tr>
<tr>
<td>4. Feeding lying down</td>
<td>4. Certain ethnic groups- Native American</td>
</tr>
<tr>
<td>5. Daycare attendance</td>
<td>5. Mild heredity risk</td>
</tr>
</tbody>
</table>
What are the common pathogens?

Usually begins as a viral infection and edema of eustachian tube mucosa.

Studies of middle ear fluid culture positive for bacteria - 70-90%

- *S. pneumoniae*: 35-50% (50% resistance to Penicillin)
- Non-typeable *H. influenzae*: 30-40% (40% + β lactamase)
- *Moraxella catarrhalis*: 15% (all + β lactamase)
- *S. pyogenes*: 5%, more common in older children causes more inflammation with ↑ risk mastoiditis
- Viruses: RSV, parainfluenza, influenza often co-pathogens
What are your treatment options?

• Discuss watchful waiting with parents

• Pain control with tylenol or ibuprofen

• Amoxicilllin at a dose of 80-90 mg/kg/day

Is Azithromycin a reasonable choice?

• Over last decade strains of H.Flu and M. catarrhalis have become resistant
AOM Management

Decision to treat based on age, severity, recurrence and health related factors

2013 guidelines – there is a modest benefit to antibiotics but that must be weighed against increasing antibiotic resistance **
In what situation is watchful waiting appropriate?

• Children over age 6 months with unilateral AOM, non-severe symptoms

• Fever < 39 degrees

• Mild pain or general discomfort

**Key Point:** Close follow-up must be in place if watchful waiting is used.
## Recommendations for initial management for uncomplicated AOM

<table>
<thead>
<tr>
<th>AGE</th>
<th>OTORRHEA WITH AOM</th>
<th>UNILATERAL OR BILATERAL AOM WITH SEVERE SYMPTOMS</th>
<th>BILATERAL AOM WITHOUT OTORRHEA</th>
<th>UNILATERAL AOM WITHOUT OTORRHEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months-2 years</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy or additional observation</td>
</tr>
<tr>
<td>&gt;2 years</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy or additional observation</td>
<td>Antibiotic therapy or additional observation</td>
</tr>
</tbody>
</table>

Case #2

You see a 4 month old girl with a history of fussiness, poor feeding and sleeping. There is no history of fever. On exam she is irritable but consolable, afebrile. Exam of her right TM reveals erythema and a bulging TM. Her left TM is normal. What is the appropriate treatment.

a. Watchful waiting
b. Amoxicillin 80-90 mg/kg/day, divided bid
c. Amoxicillin/clavulanate 80-90 mg/kg/day divided bid
d. Azithromycin 10 mg/kg for day one and then 5 mg/kg day 2-5
If there is no response to treatment in 48-72 hours, how would treatment change?

- Amoxicillin/clavulanate
- Cephalosporin for penicillin-resistant *S pneumoniae*
- Clindamycin and third generation cephalosporin for resistant *S pneumoniae*
- Cefatriaxone (3 doses)
4 month old with bulging right TM also has a purulent conjunctivitis. How does that change your treatment plan?

Add antibiotic to cover β-lactamase-producing strains of *H influenzae* as well as penicillin-resistant *S pneumoniae*

- Amoxicillin/clavulanate
- Cephalosporin (cefdinir, cefuroxime, cefpodoxime)
- Cefatriaxone (3 doses)
What AOM follow-up is needed?

• If improved, no specific f/u needed

• 60% of children with resolution in 1 month

• 80% in 2 months

• 90% in 3 months

• If symptoms persist, f/u intervals should not be less than 4 weeks
Case #3

You see a 12 month old girl who has a runny nose and 3 days history of fever of 103. She attends daycare. You diagnose AOM and treat with Amoxicillin/clavulanate. This is her third episode of AOM in the last 5 months. What additional advice do you give her parents?

• There is limited usefulness of prophylactic antibiotics
• Referral for tympanostomy tubes may be beneficial
• Annual influenza vaccines are important
Your patient’s parents are concerned about side effects of tympanostomy tubes. What do you tell them?**

<table>
<thead>
<tr>
<th>Short-Term</th>
<th>Long-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Obstructed tube lumen</td>
<td>• Tympanosclerosis</td>
</tr>
<tr>
<td>• Tube otorrhea</td>
<td>• Hearing loss</td>
</tr>
<tr>
<td>• Premature extrusion</td>
<td>• TM retraction</td>
</tr>
<tr>
<td></td>
<td>• Persistent perforation</td>
</tr>
<tr>
<td></td>
<td>• Cholesteatoma risk ?</td>
</tr>
</tbody>
</table>
When would you recommend an adenoidectomy for this child?

1. Insertion of tympanostomy tubes is not an indication but recurrent need for tubes may be

2. Obstructive sleep apnea
Case 4:

You are seeing a 1 month old infant in the office, who was brought in by her mother and her boyfriend for irritability and excessive crying. They state that she cries excessively in the evening hours and seemingly “too much”. Her birth history, past medical history, and current vital signs/physical exam all are unremarkable, and she seems to have gained weight adequately since birth.

Questions

1.) Are there any further elements of the history or physical exam that are important to elicit?

2.) What amount of time is “normal” for infants to cry?

3.) What is the most likely diagnosis and which labs and evaluations may be useful?
After diagnosing infantile colic and appropriate counseling and anticipatory guidance, the family is discharged home. They present again to the ED several months later. The mother of this now 5 month old baby feel that their baby has been teething and has a low grade temperature. She has been exceedingly fussy and irritable. They have missed their well care visits, but you notice that her weight percentiles have significantly dropped. On examination, the child is irritable and not completely consolable. You notice a bruise on the thigh, which the boyfriend states “has always been there.” The mother appears to be sullen, not interested in comforting her baby, and not making any eye contact with you. Neither are the siblings.
Questions
4.) Are there any further elements of the history or physical exam that are important to elicit?
5.) What risk factors are present in this case for physical abuse?
6.) What are the appropriate next steps to take in approaching this child’s care?
7.) Which physical findings can often be mistaken for abuse?
8.) Which radiographic findings are highly specific for physical abuse?
9.) What effects may domestic violence have on the siblings?
Colic is generally manifested by excessive crying

– Crying lasts for more than three hours per day, occurs on more than three days per week, and persists for more than three weeks, commences around 3 weeks of age
– Diagnosis of exclusion: otherwise generally normal growth and exam
– Normal crying at 6 weeks of age peaking at < 3 hours, but quite variable
– Thorough history and evaluation (likely to be most important factor in diagnosis, as physical exam and laboratory evaluation generally not helpful) should include careful social history and parent-infant interaction:
  • Parent responses to excessive crying
  • Effective counseling for parents on how to cope with stress and manage infantile colic
    – Episodes of crying may trigger abusive behaviors in caregivers
Colic treatment- 5 S’s

1. Swaddle
2. Shush
3. Swing
4. Suck
5. Side or stomach position
Physical child abuse

– Over 12 cases per 1000 children of child abuse/neglect
  • Neglect is the most common form of child abuse

– Often accompanied by other forms of domestic violence

– Nearly 90% are caused by a related caregiver
Physical child abuse with several risk factors:

In the parent or caregiver:

- Denial of pregnancy
- Inappropriate expectations of child
- Immaturity
- Social isolation
- Substance abuse
- Previous injury or neglect of another child
- Domestic violence
- Propensity to deal physically with frustrations
- Childhood deprivation
Physical child abuse with several risk factors:

In the child:

- Prematurity
- Cognitive abnormalities
- Handicapping conditions
- Any condition that interferes with attachment
- Parent-child temperament differences
- Difficult developmental stage
- Behavioral problems, hyperactivity
Physical child abuse with several risk factors:

Social/Situational stressors:

- Poverty and isolation
- Family discord
- Parent-child conflicts
- Multiple births
Barriers to substantiating or reporting history/evidence of abuse

– Failure to locate parent/child

– Refusal to cooperate with investigation

– Refusal to repeat history

– Language and cultural barriers to reporting
Thorough history and physical exam should be performed

– Interview parents and child separately if possible

– Evaluate for inconsistencies in historical account or plausibility

– Physical exam of general appearance and assessment from head to toe
Close attention should be paid to signs/disorders that may mimic abuse:

– Slate gray/Mongolian spots
– Bleeding disorders
– Henoch- Schonlein purpura
– Urticaria Pigmentosa
– Procedures or cultural practices:
  • Coining
  • Cupping
  • Moxibustion
  • Spooning
If a burn is suspected, evaluate for signs of accidental burns:

– Typical splash and burn of a scald injury

– Inverted arrowhead of accidental pour onto chest from hot liquid
Distinguish between non-accidental burn and:

- Impetigo
- Toxic Epidermal necrolysis
- Contact dermatitis
- Cutaneous herpes infections
- Fixed Drug eruptions, Stevens-Johnson’s syndrome
- Phytophotodermatitis
Radiographic findings that are highly specific for abuse:

1. Posterior rib fractures

2. Metaphysis chip fractures of the long bones ("bucket handle" or "corner")

3. Fractures of the scapulae and sternum

- Osteogenesis imperfecta, hypophosphatasia, infantile cortical hyperostosis may be confused with inflicted fractures
Treatment should focus on initial safety and appropriate medical management of child

– Skeletal survey
– Retinal examination
– Multidisciplinary team approach facilitates evaluation and management and may help further recognize circumstances contributing to domestic violence:
  • Effects of reports by child protection agencies on stress of family
  • Depression
  • Substance abuse
  • Chronic medical problems
  • Physical injuries
  • Stressors of foster home placement
Case # 5
A five year girl comes to your office with complaints of a sore throat and fever to 101. Her mother states that strep throat is going around her classroom. Her exam is notable for posterior pharyngeal erythema and petechiae. Rapid strep is positive.

Group A strep is a self-limited disease. Why treat?
• Prevent suppurative complications (peritonsillar or retropharyngeal abscesses)
• Reduce communicability
• Prevent Rheumatic Fever
Her mom firmly tells you that this is her third episode of strep in the last 3 years and requests referral for tonsillectomy.

**What are the indications for a tonsillectomy that you discuss with mother?**

- **Absolute:**
  - OSA
  - Suspected malignancy
  - Recurrent hemorrhage

- **Relative**
  - Recurrent disease (7 episodes in 1 year, 5 episodes/yr. X 2 years or 3 episodes/yr. X 3 years)
  - Recurrent peritonsillar abscess
Adenoidectomy-Indications for Surgery

- OSA

- Chronic adenoiditis

- Chronic sinusitis

- Repeat tubes for chronic OME
Case #6

Later that day, a 5 year old boy comes in because he has had a swelling in the middle of his neck over his trachea for 2 months. He is well, but over the last week, the mass has become red and tender.

What is the most likely diagnosis?
Thyroglossal duct cysts
• 70% of all cysts in the neck
• Usually noted by age 2
What is the differential diagnosis?

1. **Midline**
   - Thyroglossal duct cyst
   - Dermoid cysts
   - Cervical thymic cysts

2. **Brachial cleft (cysts)** – opening located on anterior border of lower SCM

3. **Cystic hygroma** – post triangle neck

4. **Pseudo tumor of SCM** - ? etiology

5. **Infections**
   - Lymphadenopathy /adenitis (eg: atypical TB, cat scratch, EBV, staph, MRSA, strep)

6. **Neoplastic**
   - Hodgkins lymphoma, Sarcoma, Rhabdo, Neuroblastoma (<5 years), Histiocytosis, Teratoma
What test do you order?
• Confirm with ultrasound

What treatment do you recommend?
• Surgical removal

What are branchial cleft anomalies?
• Congenital remnants of lateral 4 branchial pouches and clefts (usually 2\textsuperscript{nd} pouch). They present as small dimple or opening anterior to the middle portion of the sternocleidomastoid muscle.
What is your workup for adenopathy?

- **Laboratory**: CBC with diff, sedimentation rate, EBV or CMV titers (when adenopathy is diffuse), HIV, blood culture (if febrile), Bartonella, Tularemia, Brucellosis titers.
- Chest X-ray if extensive lymphadenopathy or cough, fever
- Ultrasound
- CT
- Fine needle biopsy
- Excisional biopsy
Case 7

A 2 month old male presents with a 2-3 week history of increased fussiness with feeding, but is otherwise well. His mother states he has occasional non-bloody, non-bilious emesis after feeding and gross blood in recent bowel movements. The infant was solely breastfed for the first postnatal month prior to switching to cow milk formula. On PE, the infant appears healthy and in no apparent distress. Vital signs include a pulse of 120 beats/min, respiratory rate of 30 breaths/min, and a blood pressure of 90/50 mm Hg. His birth weight was 3.2 kg and he currently weighs 4.8 kg. His abdomen is soft, non-distended, and without hepatosplenomegaly. A stool guaiac is positive. Of the following, which is the best answer:

a. Change to a non-lactose cow milk formula
b. Change to a soy based formula
c. Change to a protein hydrolysate formula
d. Perform an IgE level
e. Perform allergy skin testing to cow milk
Question 1

• What is the differential diagnosis for blood in the stool of an infant?
Question 2

• What treatment strategies are available for the most likely diagnosis?
Milk Protein Allergy (intolerance)

1. Usually presents by 6 weeks
2. 2-3% incidence
3. Abdominal pain, bloody diarrhea, anemia
4. Wheezing, anaphylaxis
5. Exacerbation of atopic dermatitis, growth failure
6. 10-35% have soy intolerance
Milk Protein Allergy

**Diagnosis**

- Gold standard – milk elimination followed by challenge
  - Unless IgE mediated
- Can become tolerant to milk in 1-3 years

**Treatment**

1. Extensively hydrolyzed formula
2. Amino acid based formula
Lactose Intolerance

1° Lactose Intolerance

- Rare and may develop over time
- Reducing substances in stool

2° Lactose Intolerance

- Occurs after protracted diarrhea
- May develop later in life in certain ethnic groups
- Yogurt has fermented bacteria producing lactase
Case #8

You see a 24 month old boy for his annual physical exam. This is your oral exam.

What is your diagnosis?
Early Childhood Caries
What is the most common chronic disease of childhood?
Early childhood caries!

- 25% of children have 80% of disease\(^1\)
  - Disproportionately affects racial/ethnic minorities and disadvantaged populations

- 28% of preschoolers age 2-5 had clinically visible cavities from 1999-2004, an increase of 15% from 1988-1994\(^1\).

\(^1\)Surgeon General’s Report on Oral Health 2000
What causes ECC?

• ...an infectious and transmissible disease strongly modified by diet

• Main players
  1. Cariogenic bacteria
  2. Fermentable carbohydrates
  3. A susceptible tooth and host
  4. Time
Infectious agent: 

*Streptococcus mutans*

- Transmission is mainly from mother or primary caregiver to infant.
- The earlier the transmission, the higher the risk of caries.
What is significant about these findings?

- Caries can be posterior
- Associated with inappropriate breastfeeding, nursing bottle and sippy cup use

Caries on lingual (inside) surfaces of upper incisors
## Caries Risk Assessment for 0-3 Year Olds (For MDs and Others)

<table>
<thead>
<tr>
<th>Factors</th>
<th>High Risk</th>
<th>Moderate Risk</th>
<th>Protective</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biological</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Mother/primary caregiver has cavities</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent/caregiver has low socioeconomics status</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child has &gt;3 between meal sugar-containing snacks or beverages per day</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child is put to bed with bottle containing natural or added sugar</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child has special health care needs</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child is a recent immigrant</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protective</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Child receives optimally fluoridated drinking water or fluoride supplements</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>*Child has teeth brushed daily with fluoridated toothpaste</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Child receives topical fluoride from health professional</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>*Child has dental home/regular dental care</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td><strong>Clinical Findings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child has white spot lesions or enamel defects</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child has visible cavities or fillings</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child has plaque on teeth</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

American Academy of Pediatric Dentistry Caries-risk Assessment Form for 0-3 Year Olds
(For physicians and other non-dental health care providers)

*CHPCC questions