Pharyngitis: just another pain in the neck?

I remember in the not-too-distant past feeling so awful, I wanted to end it all. I had fevers up to (oh my gosh!) 101°F, and my throat hurt so bad all the time, whether I was drinking or watching television. I know I was dehydrated, because it caused me extreme pain to swallow anything. I was a little disheartened when I realized I would probably be triaged as a green (non-urgent) patient in our own ED, especially since I was sure the end was near. I was sure I had strep...but I was too much of a baby to let my husband swab my throat in his office. I mean, seriously, that hurts! Well, shockingly, I got better in 3-4 excruciating days. I'm not sure if it was because the virus cleared, or if it was the z-pack I broke down and took in an attempt to save my marriage. Either way, in that week, I found a whole new respect for people with pharyngitis.

In the U.S. pharyngitis accounts for ~10% of outpatient visits in children annually. In the U.S. pharyngitis accounts for ~10% of outpatient visits in children annually. The majority of patients that I see with pharyngitis already have a rapid strep test done before I see them, taking some of the mystery away. For the ones that are rapid strep +, it's usually (but not always) a hello, I'm sorry you have strep, would you like a shot? In the most part, the ones whose rapid strep tests are negative get the hello, I'm sorry you feel bad but you don't have strep, what color Gatorade would you like interaction. But, it's those ones that aren't part of the “usually” or “for the most part” that can complicate things. The differential diagnosis for the patient presenting with pharyngitis is too diverse...after all, it's a pretty small area. But we will discuss the common (and not-so-common) offenders and their treatment strategies.

**Epiglottitis**
I hate even typing this word, and I feel fortunate that I am practicing pediatrics in the post-HIB immunization era. And it is true that it is going to be highly unlikely that I will see true epiglottitis in an infant or toddler...but what about the adolescents? Although the presentation is not as dramatic, they still can run the risk of airway compromise. Watch for the teenagers that present with extremely painful throat, possibly laryngitis, and very little by way of pharyngeal inflammation on exam. I’m not saying it’s common, but I am asking you to not forget about it entirely.

**Ludwig’s Angina**
The more I read about mouth infections, the happier I am I didn’t go to dental school. The mouth is probably the germiest part of our bodies, so it stands to reason that it could get infected fairly easily. Although this is seen mostly in adults, it can be seen in children. It is usually associated with recent dental work, trauma, immunocompromise, and tongue piercing. Patients may present with mouth, tooth, and neck pain as well as drooling, trismus, and odynophagia. Dysphonia can also be seen. Physical exam may reveal swelling to the floor of the mouth, and elevation/posterior displacement of the tongue, which is due to the cellulitis, possibly gangrenous, that is developing. Initial treatment is typically consultation with the oral surgeon.

**Infectious Mononucleosis**
Mono is usually caused by the Epstein-Barr or cytomegalovirus. Affectionately called “the kissing disease”, it is spread through bodily fluids. ~80% of patients will have tonsillopharyngitis associated with this disease. Other symptoms may include fatigue, fever, lymphadenopathy, splenomegaly. This sometimes can be distinguished from infectious pharyngitis by history, but this is often difficult, and rapid mono testing is not highly sensitive. Treatment is supportive, limitation of contact sports. Occasionally the tonsillar hypertrophy associated with mono will cause airway issues, requiring administration of steroids.

Pharyngitis continued on page 4
As I was searching for articles to review for this issue of The Polhill Report, I noticed a common theme kept popping up. So I’ve decided to dedicate this edition of journal search to bronchiolitis...the now seemingly ever-present, increasingly frustrating disease (for patients, parents, AND physicians) that accounts for a significant number of pediatric hospitalizations. As a clinician in the emergency department, I see and feel the frustration first hand, and I know all of you do as well. So, it stands to reason that it is good there are so many articles on management of bronchiolitis...maybe someone has found something we can do that will actually help…

**Evaluation of the Utility of Radiography In Acute Bronchiolitis**


I've done it many times...the 6 month old, first-time wheezer, right in the middle of the Winter...order a chest x-ray. How often am I surprised at the results? Rarely. It almost always reveals that “viral lower airways disease” or “peribronchial thickening” pattern. But I still check them. What do I think I'm going to find? The undiagnosed diaphragmatic hernia or congenital heart disease? The bacterial pneumonia? The dime the older sibling put in the “piggy bank”? Any and all of the above?? Some would (and do) argue that routine chest radiography is unnecessary in routine bronchiolitis. This study decided to evaluate the radiographic alternate diagnosis in those with clinical bronchiolitis,, and also the impact of radiography on therapy. This prospective cohort study evaluated patients 2-23 months of age with a “typical presentation of acute bronchiolitis” which was defined as non-toxic appearance with coryza, cough, and respiratory distress with wheezing for the first time. Patients with past history of wheezing, underlying cardiopulmonary disease, or prematurity were excluded. All enrolled patients were treated with nebulized albuterol, and then underwent chest radiography. The treating physician characterized the CXR as simple bronchiolitis (prominent bronchial markings with or without hyperinflation or atelectasis), complex bronchiolitis (airway disease and adjacent airspace disease, but no lobar consolidation), or inconsistent with bronchiolitis (lobar consolidation, cardiomegaly, etc). All x-rays were reviewed by attending radiologists.

1265 infants were enrolled in the study. Of those radiographs, 246 were classified as simple (92.8%), 17 were classified as complex (6.9%), and 2 were considered inconsistent with bronchiolitis (0.7%). Clinically, 26% of the patients with complex bronchiolitis by x-ray had oxygen saturations ≤ 92%, as compared with 6% of those with simple. The mean respiratory distress assessment instrument (RDAI, table 1) was also higher for the complex patients.

1.7% of patients were admitted to the hospital, and there was no significant difference in disposition pre- and post- x-ray interpretation. Of interest, however, based on the treating physicians interpretation of the CXR, >5 times as many children received antibiotic therapy post-radiography. Of the 2 patients with x-rays inconsistent with bronchiolitis, both were RSV+. One was diagnosed with a secundum ASD, and the other with a lobar consolidation. These patients, as well as the rest of the study patients, recovered without adverse event.

Based on their findings, these investigators feel that routine radiography is not warranted in children with typical bronchiolitis, and should be reserved for those with severe distress and significant hypoxia. I'm sure I will have plenty of opportunity to try this out in the upcoming months.

**A Multicenter, Randomized, Controlled Trial of Dexamethasone for Bronchiolitis**


Steroids in bronchiolitis...we want them to help...we want ANYTHING to help...but do they?

This group randomized children 2-12 months of age with a first episode of wheezing characterized as mild-to-moderate bronchiolitis (RDAI score ≥ 6) into a dexamethasone group (1mg/kg orally), and a placebo group. Other therapies for bronchiolitis were given at the discretion of the treating physician. The primary outcome assessed was hospitalization rates 4 hours after dosing of the medication. Excluded from the study were the usual suspects: those with Immuno-suppression, known heart or lung disease, prematurity (<36 weeks EGA), known hypersensitivity to dexamethasone, active varicella or recent exposure, and treatment with steroids in the preceding 14 days.
600 infants underwent randomization. Baseline demographics, clinical characteristics, and other therapies given were similar in both groups. 39.7% of those in the dexamethasone group and 41% of those in the placebo group were admitted. Interestingly, patients with a history of atopy or family history of asthma were analyzed in a prespecified subgroup, and there was no statistical or clinical difference in those groups as well. So, in case there were any lingering questions... we still can’t prove that steroids help in bronchiolitis.

Infants up to the age of 18 months admitted with moderately severe bronchiolitis were eligible for inclusion. This was defined as having a history of preceding viral upper respiratory infection, with the presence of wheezing or crackles on exam and a RDAI score of ≥4. After enrollment, the patients were randomized into a hypertonic or normal saline group. The study solution was given in double-blind fashion every 2 hours for 3 treatments, then every 4 hours for 5 treatments, followed by every 6 hours until discharge. Any non-protocol therapies were ordered at the discretion of the treating physician, and if those therapies included nebulization treatments, they were mixed in the assigned study solution.

Both groups had comparable baseline presentations and demographic information, and there were no significant adverse events noted with either therapy. On average, a reduction in length of stay of one day (~25%) was noted in the hypertonic saline group, which could translate into a much larger economic difference in terms of hospital costs and days lost from work for parents. There is some question as to whether inhalation of hypertonic saline causes bronchoconstriction, and the majority of these children received inhaled bronchodilators 5 times a day. There were no adverse events related to the use of nebulized hypertonic saline alone. Although further research needs to be done to examine optimal dosing and if co-administering with a bronchodilator is required, these investigators feel this is a safe, inexpensive, and effective way to treat admitted patients with bronchiolitis. Since these children seem to require several treatments, I don’t know if it will be useful for the ED, but it hasn’t been studied yet... hmmmm...
Pharyngitis: just another pain in the neck? con’t from page 1

Table 1: Etiology of Viral Pharyngitis

<table>
<thead>
<tr>
<th>Virus Type</th>
<th>Clinical Features</th>
</tr>
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<tbody>
<tr>
<td>Cytomegalovirus (CMV)</td>
<td>* Similar to EBV, but milder</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>* Presents with intense exudative pharyngitis</td>
</tr>
<tr>
<td>* 50% of cases have accompanying conjunctivitis</td>
<td></td>
</tr>
<tr>
<td>Herpes Simplex (HSV)</td>
<td>* Fever, decreased oral intake, and multiple shallow ulcers over the entire oral cavity</td>
</tr>
<tr>
<td>* High risk of dehydration</td>
<td></td>
</tr>
<tr>
<td>Coxsackievirus</td>
<td>* Lesions are larger than those of HSV, and limited to posterior pharynx</td>
</tr>
<tr>
<td>* May also present with lesions on hands, feet, buttocks, or genitals</td>
<td></td>
</tr>
<tr>
<td>(hand-foot-mouth disease)</td>
<td></td>
</tr>
<tr>
<td>Influenza Virus</td>
<td>* Associated with Influenza A and B</td>
</tr>
<tr>
<td>* Usually non-exudative and without lymphadenopathy</td>
<td></td>
</tr>
<tr>
<td>* Other symptoms typically present (cough, myalgias, headache)</td>
<td></td>
</tr>
<tr>
<td>Human Immunodeficiency Virus type 1 (HIV-1)</td>
<td></td>
</tr>
<tr>
<td>* Primary infection involves sore throat, and usually arthralgias and myalgias</td>
<td></td>
</tr>
<tr>
<td>* Adenopathy common, exudates uncommon</td>
<td></td>
</tr>
</tbody>
</table>

The throat culture has become the “gold standard” for diagnosis of streptococcal pharyngitis. However, this has the potential to be inaccurate due to technique and amount of local bacteria. The rapid antigen detection tests have become the mainstay in the ED, although all negative tests are confirmed by culture, and follow-up of culture results are ensured. Although rapid antigen tests have a high specificity, the sensitivity has been historically low. The most recently developed tests use optical immunoassay (OIA) technology. Studies on sensitivities of these tests range from 77% to 99%. If it is true that the sensitivity is 99%, then negative rapid antigen tests would not need confirmatory culture, making it the cost-effective option. However, if the sensitivity is truly closer to 77%, then up to 20% of cases of streptococcal pharyngitis would be missed by rapid testing and not detected unless a culture was performed. There are tests being developed with higher sensitivities. Unfortunately, the newer methods are unlikely to have a rapid turn around time necessary for same day treatment in the ED or office.

Initial treatment of GABHS is penicillin, and erythromycin in those who are penicillin allergic, even though there is evidence of growing resistance. Treatment failures may be treated with amoxicillin/clavulanate or clindamycin (Tables 2 and 3).
Treatment based on rapid antigen vs. culture results may produce a delay in therapy. Early vs. delayed therapy has several considerations. Early therapy (within 48 hours of symptom appearance) appears to shorten the duration of symptoms, limits spread, limits losses to follow-up, and limits the amount of work and school missed. However, delayed therapy may prevent possible drug reactions, and also avoid the higher failure rate associated with early therapy due to inadequate immune response. Importantly, rheumatic fever can be prevented even if antibiotic therapy is initiated as late as 9 days from onset of symptoms.

Anaerobes

The 3 most commonly found anaerobic organisms found in cases of pharyngitis are: Fusobacterium, Peptostreptococcus, and Bacteroides. In the immunocompetent host, these can cause peritonsillar abscesses. Others at risk are those who are malnourished, immunosuppressed, or those who have undergone neck irradiation.

Neisseria gonorrhoea

Gonococcal pharyngitis is transmitted by orogenital contact. Females are 2-3 times more likely as males to be infected, and homosexual males have the highest infection rate. Many of these infections may be asymptomatic, but a high index of suspicion is needed, especially in the adolescent population. A culture on Thayer-Martin agar is best for the diagnosis. There are some non-pathogenic strains of Neisseria that colonize the pharynx, so the diagnosis of gonococcal pharyngitis in a child should be confirmed by a second set of cultures. Treatment is typically with ceftriaxone or azithromycin.

<table>
<thead>
<tr>
<th>Not to be confused with:</th>
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One entity seen in pediatrics that contains many of the same features of pharyngitis (especially streptococcal) is Kawasaki’s disease. The strict criteria for Kawasaki’s disease are: fever for 5 days and 4 of the following:

- Non-exudative, scleral conjunctivitis
- Erythema of the lips and oropharynx, the so-called “strawberry tongue”
- Cervical lymphadenopathy
- Polymorphous rash (that can resemble scarletina)
- Swelling and erythema of the hands and feet

Although, a red throat is a feature of Kawasaki’s, technically, a sore throat is not. Although, many would say the last criteria for Kawasaki’s is “the absence of documented streptococcal infection”.

As we enter this fall and winter season, I hope this review will help all of us to make the educated diagnosis and decision for our patients. Most importantly, I hope I don’t get it! Good luck!

Table 2: Antibiotic Recommendations for GABHS Infections

<table>
<thead>
<tr>
<th>Medication</th>
<th>Adult</th>
<th>Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pen VK 250 TID-QID x 10d</td>
<td>Pen VK 500 BID x 10d</td>
<td></td>
</tr>
<tr>
<td>Bacillin 1.2 million units IM x 1</td>
<td>Bacillin: &lt;27 kg 600,000 units IM x 1</td>
<td></td>
</tr>
<tr>
<td>≥27 kg 250 TID-QID x 10d</td>
<td>≥27 kg 500 BID x 10d</td>
<td></td>
</tr>
</tbody>
</table>

* cephalosporins should not be used in those with type I hypersensitivity to penicillins

Table 3: Other Agents Effective Against GABHS

<table>
<thead>
<tr>
<th>Medication</th>
<th>Adult</th>
<th>Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefuroxime</td>
<td>250 BID x 10d</td>
<td>20 mg/kg/day BID x 10d</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>300-450 QID x 10d</td>
<td>20-30 mg/kg/day QID x 10d</td>
</tr>
<tr>
<td>Amoxicillin/clavulanate</td>
<td>250-500 TID x 10d</td>
<td>40 mg/kg/day TID x 10d</td>
</tr>
</tbody>
</table>

References:

Just in time for Halloween, this is the first installment of tales from the basement...true stories of our patients that have made me a little...well...scared.

**CC:** Altered mental status

**HPI:** 10yo male brought to ED by EMS with c/o altered mental status. The history is obtained through mom and a Spanish interpreter. The patient was in his usual state of good health until 2 days prior to presentation when he had abdominal pain, nausea/vomiting. The symptoms continued through the night, so they went to their PMD the next morning. In the office, he was afebrile and non-toxic appearing. Mom was told it was most likely a viral illness, given a shot of IM promethazine and sent home. He went to sleep at noon, and when mom woke him up at 11pm, she noticed he was confused, dysarthric, and having hallucinations.

The next day, mom took the patient with her to run some errands, when she noticed him having a “seizure” that was described as flexion of arms, extension of legs, shivering, and rigidity. She called 911, and EMS transported him to the ED.

**PMH:** none

**PSH:** none

**Meds:** Delsym™, Nyquil™, promethazine (Phenergan™)

**All:** NKDA

**FH:** noncontributory

**SH:** no recent travel, camping; no exposure to exotic animals or bats; has a guinea pig at home.

**PE:**

VS on arrival: T 99.7°F, P 127, R 25, BP 147/87

Gen: Minimally responsive to pain, groaning, flexor posturing, shivering intermittently

HEENT: PERRL 4mm, eyes deviated to right, gag intact

CV: tachycardic without murmur

Chest: clear bilaterally

Abd: soft, without masses

Ext: CR 2 seconds

Neuro: spastic muscle tone with 3+ reflexes throughout, choreiform movements of upper extremities

Skin: warm, dry, without rash

**ED course:**

With the concern for dystonic reaction from promethazine vs. seizure/encephalopathy, the patient was given diphenhydramine 50mg IV, and lorazepam 2mg IV without change in clinical status. Repeat vital signs 30 minutes after arrival reveal: T 103°F, P 194, R 56, BP 134/98.

With rise in temperature, neuroleptic malignant syndrome was also on the differential. Toxicology and neurology were consulted. A stat bedside EEG was performed, which showed no evidence of seizure activity. Cooling measures were begun, as well as further therapy with IV benzodiazepines, IV Dantrolene™, and bromocriptine through the NG tube.

Clinically, the patient had declining mental status (GCS 6), so he was intubated for airway protection. Vancomycin, cefotaxime, and acyclovir were given as well prior to transfer to the PICU. Lab work revealed a normal CBC/CMP/UA/CPK. Noncontrasted heat CT was normal as well.

**PICU course (abbreviated):**

CSF studies were sent and were wnl, including HSV and enterovirus PCR. MRI was unremarkable. CPK rose to ~6,000 on hospital day 2. Also on HD 2, on repeat questioning, the mom revealed that the patient had been taking the Delsym™ on a regular basis for a cough he had developed. The addition of dextromethorphan into the mix, and potential of serotonin syndrome prompted the initiation of cyproheptadine. Within 24 hours, there was marked clinical improvement, and he was extubated on HD 4, discharged to home on HD 6.

**Discussion:**

We are all aware of the potential dangers of promethazine, including the black box warning in children < 2 years of age. But this child was 10, and sometimes this drug causes adverse events in older children and adults as well. These events are impossible to predict, though frightening to the caregiver and medical staff nonetheless.

References:

Another issue that has come into light recently is the use of OTC cough and cold preparations in children. The FDA has recently published a consumer update for parents regarding these medications, as the potential for dosing error and overdosage is high. They strongly limiting the use of these medications in children < 2 years of age.

Dextromethorphan, specifically, is one OTC medication that is abused for its euphoric effects, with a 300% increase in abuse from 2001-2004. At lower doses, it has a mild stimulant effect, but at much higher doses can cause total dissociation. The clinical presentation is dose dependent, ranging from tachycardia, vomiting, diaphoresis, and loss of motor coordination to severely agitated and hyperthermic.

Serotonin syndrome classically presents as altered mental status, autonomic instability, and hyperthermia. It is most commonly seen with 2 or more drugs interacting. It is usually associated with combination of Dextromethorphan and SSRIs, MAOs, TCAs, some antibiotics, drugs of abuse, and possibly promethazine.

**Bottom line:**
The medications we have discussed today are good drugs and have good uses and indications. Just know the risks associated with them, especially in the pediatric population. The adverse events are few, fortunately, but we have the chance to make them even fewer.

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**As I Live and Breathe: Notes of a Patient-Doctor**
Jamie Weisman, MD
North Point Press, 2002

Traditional medical stories generally depict a physician who suddenly becomes a patient. This process often describes the gradual yielding of a better understanding of patient's feelings, including helplessness, loss of control and fear. This book, on the other hand, brings a unique twist onto this story line.

Jamie Weisman was a patient long before she was a physician. In this memoir, the author describes her long journey of difficult diagnosis, treatment and daily battle with a life-long rare autoimmune disorder. Through her experiences, with many physicians, both good and bad, she decides to become one herself. Her unique understanding of what a patient feels gives her the ability to comfort her patients, to help them understand what they are being told and how it will affect them.

As I Live and Breathe tells the story of Jamie's medical problems and treatments, her training in medical school, and early life as a doctor, wife and mother. Her situation arouses curiosity. How do you get by day-to-day with a lifelong illness? Once you are ill, why do you decide to go into medicine? From her unique perspective, Weisman gives an honest portrayal of her reactions. She is flawed and imperfect. She gets depressed, angry and frustrated just like the rest of us, all, in addition to battling her own body on a daily basis.

Weisman has created a poignant, compelling memoir, not only with the delicate balance between the patient and doctor, but that between sickness and health. She gives us all an opportunity to reevaluate our own lives, and the things that many of us consider to be problems. The reader of this book, will likely finish with a newfound appreciation for illness, medicine and life in general.
Spotlight on New Faculty

We are fortunate to be able to announce the return of Dr. Bridgette Davis Guthrie to our pediatric emergency medicine family! Many of you will remember Bridgette from her medical school and residency years here at UAB. When she finished her pediatric residency in 2003, Bridgette moved to Chicago for her emergency medicine fellowship at Children’s Memorial Hospital. Finally, after a few years, our wishes came true and Bridgette and her husband Greg were looking to come back to the southeast!!

Her time in Chicago was very well spent, including research on end-tidal carbon dioxide values in children with acute asthma. An accomplished runner, she also managed to find time to train for and complete the Chicago marathon...more than once. Please join us in welcoming Bridgette back to Birmingham!