Throat Infections

ILOS

• Enumerate causes of throat infections
• Differentiate bacterial especially GAS from viral pharyngitis
• Define the sequelae of GAS pharyngitis
• Plan properly the treatment of Streptococcal pharyngitis and to criticize different treatment options.

Definition

• Upper respiratory tract infections (URTIs) are the illnesses caused by an acute infection which involves the upper respiratory tract: nose, sinuses, pharynx or larynx (Wikipedia, Sept., 9, 2011).
• The most common infections in childhood with 6-8 colds / year (2-4 in adults).
• The most common medical reasons for school absenteeism.
• Account for 7% of all pediatrician visits.
• Approximately 1/3 of URTIs present with sore throat as the primary symptom.

Etiology of Acute Pharyngitis

The etiology is mostly viral with 5-30% are bacterial usually caused by GABHS.
Non infectious causes include allergy or physical irritation
GABHS infection is usually self-limited and therapy is usually indicated to prevent late sequelae as AGN or ARF.

Epidemiology

Infection occurs through contact with infected secretions and can be interrupted through hand hygiene
Viral infections are common in fall, winter and spring.
GAS infection is uncommon before 2-3 y and peaks in early school years and occurs most often in winter and spring.

Streptococcal score for GABHS pharyngitis (ACP/CDC, 2003)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>+1</td>
</tr>
<tr>
<td>Absence of cough</td>
<td>+1</td>
</tr>
<tr>
<td>Cervical adenopathy</td>
<td>+1</td>
</tr>
<tr>
<td>Tonsillar exudate</td>
<td>+1</td>
</tr>
<tr>
<td>Patient’s age: &lt; 15 y</td>
<td>+1</td>
</tr>
<tr>
<td>15-45 y</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 45 y</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>Probability of Strept (%)</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1 or 0</td>
<td>1</td>
<td>No testing or therapy</td>
</tr>
<tr>
<td>1, 2, 3</td>
<td>10-35</td>
<td>Rapid Ag test (RAT)</td>
</tr>
<tr>
<td>4, 5</td>
<td>51</td>
<td>Empiric therapy or RAT</td>
</tr>
</tbody>
</table>

Streptococcal tonsilitis
Scarlet Fever

- Caused by erythrogenic toxin producing GAS
- Incubation Period: 2-4 days
- Isolation: 1-2 days after start of penicillin therapy
- Prodrome:
  - Duration: 12 hours to 2 days
  - Fever, vomiting, sore throat, chills, abdominal pain
- Enanthem: Red pharynx, tonsillitis, palatal petechiae, white strawberry → red strawberry tongue
- Exanthem

- Relation to fever: Rash appears 12 hours after fever, fever↑ as rash appears
- Character:
  1. Red pinpoint confluent, feeling like sandpaper (goose skin).
  2. Face: no rash, flushed cheeks + circumoral pallor
- Spreading: Neck, axillae, groins (in 1-2 days).
- Desquamation after 7 days, starts on trunk & spreads to limbs
- Diagnostic Features: Tonsillitis, circumoral pallor, pastia’s sign

Epstein-Barr Virus (EBV)

- EBV, a member of the family Herpesviridae.
- Transmission through secretions, blood, may be sexual.
- Incubation period is 4-6 weeks

Epstein-Barr virus (EBV) is the cause of mononucleosis (IM), which is characterized by:
  - Fever
  - Sore throat
  - Lymphadenopathy
  - Lymphocytosis.

Clinical Manifestations of IM

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Median Percentage of Patients (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sore throat</td>
<td>75 (50–87)</td>
</tr>
<tr>
<td>Malaise</td>
<td>47 (42–76)</td>
</tr>
<tr>
<td>Headache</td>
<td>38 (22–67)</td>
</tr>
<tr>
<td>Abdominal pain, nausea, or vomiting</td>
<td>17 (5–25)</td>
</tr>
<tr>
<td>Chills</td>
<td>10 (9–11)</td>
</tr>
<tr>
<td>Lymphadenopathy</td>
<td>95 (83–100)</td>
</tr>
<tr>
<td>Fever</td>
<td>93 (60–100)</td>
</tr>
<tr>
<td>Pharyngitis or tonsillitis</td>
<td>82 (68–90)</td>
</tr>
<tr>
<td>Splenomegaly</td>
<td>51 (43–64)</td>
</tr>
<tr>
<td>Hepatomegaly</td>
<td>11 (6–15)</td>
</tr>
<tr>
<td>Rash</td>
<td>10 (0–25)</td>
</tr>
<tr>
<td>Periorbital edema</td>
<td>13 (2–34)</td>
</tr>
<tr>
<td>Palatal erythema</td>
<td>7 (3–13)</td>
</tr>
<tr>
<td>Jaundice</td>
<td>5 (2–10)</td>
</tr>
</tbody>
</table>

EBV Cervical Lymphadenopathy

Papular Rash of IM

EBV Pharyngitis
**Differential Diagnosis Of Mononucleosis-Like Illness**

- Acute infection with cytomegalovirus.
- HIV.
- Human herpesvirus 6.
- Rubella.
- Hepatitis viruses.
- Drug hypersensitivity reactions.
- *Toxoplasma*.
- Lymphoma or leukemia.

**Complications Of GAS Pharyngitis**

- **Early Complications:**
  1. Otitis media
  2. Pneumonia
  3. Peritonsillar abscess

- **Late Sequale**
  1. Acute Rheumatic Fever (ARF)
  2. Post Streptococcal glomerulonephritis (PSGN))

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**How can you differentiate EBV from GAS pharyngitis?**

<table>
<thead>
<tr>
<th>Item</th>
<th>EBV</th>
<th>GAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incubation period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lymphadenopathy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBV Serology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Throat Culture</td>
<td></td>
<td></td>
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<tr>
<td>Response to Penicillin</td>
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**LABORATORY DIAGNOSIS OF PHARYNGITIS**

1. Complete blood count and WBCs morphology.
2. Neutrophilia in bacterial infections.
3. Lymphocytosis in viral cases.
4. Atypical lymphocytes in EBV infections.
5. Throat culture is an imperfect gold standard for GAS isolation (why?).
6. Rapid antigen detection tests.
7. Viral cultures are slow and expensive.
8. PCR for viral detection is more rapid and may be useful in some situations.
9. EBV serology

**Treatment**

1. Antibiotics
2. Symotomatic
3. Surical care
### Antibiotics in GAS Pharyngitis

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Dosage</th>
<th>Symptomatic</th>
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</thead>
<tbody>
<tr>
<td>Oral penicillin V</td>
<td>250 mg bid for 10 days</td>
<td>• Oral analgesic antipyretics such as acetaminophen or ibuprofen to relieve fever and sore throat.</td>
</tr>
<tr>
<td>Oral amoxicillin</td>
<td>250 mg tid (750 mg once daily) for 10 days/50 mg/kg/d for 6 days.</td>
<td>• Gargling with warm salt water is often comforting</td>
</tr>
<tr>
<td>Intramuscular benzathine penicillin (LAP)</td>
<td>600,000 IU for those &lt; 27 kg or 1,2 million units for larger children after exclusion of allergy.</td>
<td>• Local anesthetic sprays may provide local relief especially in ulcerative stomatitis.</td>
</tr>
<tr>
<td>Macrolides as erythromycin</td>
<td>40 mg/kg/d for 10 days in allergic patients.</td>
<td></td>
</tr>
</tbody>
</table>

### Surgical Care in Pharyngitis

- Indications for tonsillectomy:
  1. 4-5 confirmed group A streptococcal infections in a single year.
  2. Chronic sore throat with adenopathy that is not responsible to treatment over 6 months.
  3. Hypertrophied tonsils with obstruction of breathing or deglutition
- Drainage of peritonsillar abscess

### Home Message

- Up to 90% of URTI are of viral etiology.
- Throat congestion, exudate and tender anterior cervical adenopathy in children > 2 years are suggestive of streptococcal etiology
- Penicillin for 10 days is the drug of first choice in streptococcal sore throat infection.
- ARF and PSGN are important late sequelae of maltreated GAS throat infection.

### Quiz

- Throat infections are most commonly:
  a) Viral
  b) Bacterial
  c) Fungal
  d) Protozoal
- Bacterial sore throat is most commonly caused by:
  a) Hemophilus b
  b) GAS
  c) Moraxiella
  d) Gonococci
- GAS sore throat could be identified by EXCEPT:
  a) Tender Cx LN
  b) Erythema or congestion
  c) White tonsillar exudate
  d) Lymphocytosis in CBC
- EBV exudative pharyngitis is differentiated from GAS by:
  a) Lymphadenopathy & HSM
  b) Lymphocytosis
  c) Lack of response to penicillin
  d) All of the above