**STREPTOCOCCOSIS**

<table>
<thead>
<tr>
<th>Definition</th>
<th>A number of clinical syndromes caused by streptococcal infection</th>
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</table>
| **Streptococci** | Form a part of normal flora of man and animals  
May species are pathogenic to man  
Classified on the basis of hemolysis on blood agar plate |
| **Streptococci Pyogenes** | |
| **Pathogenicity of Strep. Pyogenes** | 1. Infection by the organism itself  
2. Invasion of different parts of the body  
3. Sensitization of the body to the certain products of the organism few weeks after infection of the upper respiratory tract or skin when not properly managed |
| **Infection by the organism** | Throat → sore throat  
Skin → impetigo  
Eye → purulent conjunctivitis |
| **Invasion of different part of body** | 1. The organism itself through spread infected organs or septicemia  
2. Its products of exotoxins: erythrogenic toxin, fibrinolysin, streptolysin O and hyaluronidase  
*these toxins may cause erysipelas, cellulites, puerpal sepsis and their sequelae in unmanaged cases |
| **Sensitization of the body to certain products few weeks after** | 1. Rheumatic fever: with the risk of developing RHD if not properly managed  
2. Acute glomerulonephritis: immunological response to streptococcal antigens in the population |
| **Disease produced** | 1. Streptococcal pharyngitis or tonsillitis (sore throat) *most commonest form*  
2. Wound infection  
a. Impetigo: mixed streptococcal/staphylococcal infection occurring usually in young children  
b. Erysipelas and its sequelae: neglected cases may be followed by spread of infection causing lymphangitis, lymphadenitis and finally septicemia  
c. Osteomyelitis: occurs when infection reaches bone  
d. Toxic shock syndrome  
3. Puerperal sepsis  
a. It is a form of wound infection following abortion or delivery causing endometritis  
b. If unmanaged infection spreads rapidly causing pelvic cellulites, localized peritonitis, pelvic thrombophlebitis, salpingitis, generalized peritonitis and septicemia  
4. Others; purulent conjunctivitis, scarlet fever and rheumatic fever, autoimmune disease (RF, AGN, Henoch – Schonlein purpura) |
| **Public health significance** |  
• The incidence of S. Pyogenes infections and their sequelae are not well documented in Egypt  
• Acute pharyngitis is one of the most common reasons for seeking medical advice  
• It occurs in sporadic cases all over the year  
• Morbidity and mortality from puerperal sepsis has been decline dramatically after good medical care and wide use of antibiotics  
• It may lead to dangerous systemic auto immune complication, namely RF, AGN and their sequelae |
| **Mode of transmission** | **Direct**  
Droplet, contact  
**Indirect**  
Dust, milk – borne |
# Streptococcal Pharyngitis & Tonsillitis

<table>
<thead>
<tr>
<th>Definition</th>
<th>Acute infectious disease characterized by sore throat &amp; constitutional manifestations</th>
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<tbody>
<tr>
<td>Causative agent</td>
<td>GABHS with more than 80 serotypes</td>
</tr>
<tr>
<td>Reservoir</td>
<td>Man</td>
</tr>
<tr>
<td>Cases</td>
<td>Typical or atypical</td>
</tr>
<tr>
<td>Exit</td>
<td>Nasopharyngeal discharge</td>
</tr>
<tr>
<td>Incubation period</td>
<td>1 – 3 days</td>
</tr>
<tr>
<td>Age</td>
<td>All ages are susceptible especially in preschool and school age</td>
</tr>
<tr>
<td>Immunity</td>
<td>Is specific, however repeated attacks may occur due to many serotypes of the causative organism</td>
</tr>
<tr>
<td>Environmental factor</td>
<td>Overcrowding, Poor living condition, Bad health habits</td>
</tr>
<tr>
<td>Clinical feature</td>
<td>Sudden onset of fever, sore throat or pharyngitis and headache, malaise, pain, enlarged and tender cervical lymph nodes</td>
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<tr>
<td></td>
<td>Inflammation of pharynx, tonsils and soft palate with edematous areas with purulent exudates. Tonsils are enlarged with yellowish follicular purulent spots which are easily removed</td>
</tr>
<tr>
<td>Complication</td>
<td>Local, Adjacent structure, GIT, Systemic</td>
</tr>
<tr>
<td>Peritonsillar abscess (Quinsy)</td>
<td>Rhinitis, Sinusitis, Otitis media, Pneumonia</td>
</tr>
<tr>
<td>Cervical abscess</td>
<td>Enteritis, Acute mesenteric lymphadenitis</td>
</tr>
<tr>
<td>Cervical lymphadenitis</td>
<td>Rheumatic fever AGN</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Clinical picture, Laboratory, Gold standard: culture of swab of tonsils and posterior pharynx, Rapid screening test: latex agglutination or ELISA, Rising of antistreptolysin O titre</td>
</tr>
<tr>
<td>Prevention</td>
<td>General prevention, General preventive measures for droplets infections, Sanitary environment, good ventilation and prevention of overcrowdings especially in work places, dormitories and hospitals, Milk sanitation, Health education of publics as regards source, mode transmission and importance of adequate therapy</td>
</tr>
<tr>
<td>Chemoprophylaxis</td>
<td>Repeated attacks of streptococcal infection should receive therapy for 10 days, Prevention of RHD: long acting penicillin or oral penicillin therapy for 10 days (erythromycin if penicillin allergic)</td>
</tr>
<tr>
<td>Case</td>
<td>Early case finding, Notification to local health office, Isolation at home, Treatment: oral penicillin to prevent complication. Erythromycin if allergic, Concurrent disinfection for all articles in contact with patients discharges, Release after 24 hours fro starting treatment</td>
</tr>
<tr>
<td>Control</td>
<td>Surveillance for 3 days for case finding, Chemoprophylaxis in high risk close contacts</td>
</tr>
</tbody>
</table>
### Scarlet Fever

#### Definition
It is a form of streptococcal disease characterized by a focus of streptococcal infection, usually pharyngitis, and toxaemia with a characteristic rash.

#### Causative agent
Toxigenic strains of GABHS, they produce one main toxin; so
- The individual gets one attack of toxemia and rash
- Or even none with subclinical antitoxic immunity

#### Immunity
Life long antitoxic immunity is acquired after clinical disease or subclinical infection while antibacterial immunity is type specific and repeated attacks may occur due to many serotypes.

#### Test of susceptibility
Dick test: intradermal immunity test (toxin – antitoxin reaction)
- Diluted erythrogenic toxin is injected in the forearm
- Positive test indicates susceptibility (no antitoxic immunity)
- Negative test indicates immunity (antitoxic immunity)

#### Clinical feature
Primary streptococcal lesion; streptococcal sore throat wound, skin or puerperal infection
Strawberry tongue
Exanthem: the rash is usually fine erythema punctuate blanching on pressure appearing on the neck, chest, folds of axilla, elbow and groin and inner surface of thigh. The face is not affected but there is flushing of the cheeks and circumoral pallor

#### Differential diagnosis

<table>
<thead>
<tr>
<th>Erythematous, maculopapular or petechial rash</th>
<th>Rash in the form of papulo – vesicular eruption</th>
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</thead>
<tbody>
<tr>
<td>Measles &amp; rubella</td>
<td>Chicken pox</td>
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<tr>
<td>Enteric fever</td>
<td>Popular urticarial</td>
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<tr>
<td>Typhus fever</td>
<td>Herpes simplex</td>
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<tr>
<td>Drug sensitivity</td>
<td>Herpes zoster</td>
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<td></td>
<td>Herpes of gestation</td>
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<tr>
<td></td>
<td>Dermatitis</td>
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<tr>
<td></td>
<td>Herpetiform</td>
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<tr>
<td></td>
<td>Impetigo</td>
</tr>
</tbody>
</table>

#### Post streptococcal glomerulonephritis

#### Clinical features
- Edema, puffiness of the face, hypertension and smoky or rusty colored urine
- Pallor, lethargy, malaise, weakness, anorexia, headache and dull back pain
- Fever not prominent

#### Laboratory findings
- Anemia, hematuria, proteinuria
- Urine analysis with RBCs, WBCs and casts

#### Diagnosis
- Clinical history, physical findings, and confirmatory evidence of antecedent streptococcal infection (ASO or Anti – DNAse B)

#### Therapy
- Penicillin to eradicate the nephritogenic streptococci (erythromycin if allergic)
- Supportive care of complications
<table>
<thead>
<tr>
<th><strong>Definition</strong></th>
<th>Acute disease characterized by fever accompanied with local and general signs of bacterial invasion of the genital tract in the postpartum or post- abortion patients</th>
</tr>
</thead>
</table>
| **Causative agent** | GABHS  
Other organisms as Staph. Aureus, E.Coli, Anaerobic streptococci, Cl.Welchii and Cl.Tetani |
| **Reservoir** | Man in the form of  
Cases: suffering from any disease caused by GABHS  
Carriers: nasal or throat carriers |
| **Mode of transmission** | **Indirect transmission**  
- *Vehicle – borne*: by contaminated hands or instruments that handle the wound during labor or abortion or autoinfection where the mother herself can infect the wound by contaminated hand  
**Direct transmission**  
- *Direct droplet* from nasopharyngeal discharge of birth attendant who may be a case or carrier |
| **Prevention** | **General prevention:**  
- General preventive measures for droplet and contact infections  
- Sanitary hospital environment, sanitary precaution during labor or abortion  
- Sterilization of all instrument and fomites using in labor or abortion  
- The birth attendant should follow sanitary precaution, washing hands, mask, and gloves and should be free from infection  
**Specific prevention**  
Chemoprophylaxis by antibiotics if needed |
| **Control** |  
- Early case finding any rise of temperature within 2 weeks after labor or abortion  
- Notification to health office  
- Isolation t at hospital  
- Treatment: penicillin or other antibiotics  
- Concurrent disinfection for all articles in contact with patients discharges and terminal for the room  
- Release until 3 negative successive cultures from discharge taken at least 24 hours apart and not less than 24 hours after cessation of antimicrobial therapy |
# Rheumatic fever

**Definition**
It is non suppurative systemic complication following infection of GABHS.

**Public health significance**
It have high prevalence affecting children and interfering with their physical or psychological development. It is one of the serious complications that follow streptococcal pharyngitis by about 1 – 4 week when antibodies against streptococcal antigens reach their peak.

**Pathogenesis**
- Cross reaction between streptococcal antibodies and tissues of patient due to repeated untreated attacks
- Abnormal immunological response
- This theory is supported by the occurrence of rheumatic fever after a latent period of 1 – 3 weeks after infection
- There is cross reactivity between M protein and human tissue. Immune response of M protein can also attack tissue
- Heart reactive antibodies and antibodies to somatic streptococci are found in sera of RF patients

**Predisposing factors**
- Genetic predisposition
- Age of first attack: 5 – 15 years
- Repeated attacks are common if 1st attack passed untreated

**Susceptibility**
- Age: it is essentially a disease of childhood and adolescents 5 – 15 years old
- Sex: more in female than man
- Environmental: more in winter than summer, low socioeconomic population, poor housing condition and overcrowding

**Clinical feature**
- **Major criteria**
  - Carditis
  - Arthritis
  - Rheumatic nodules
- **Minor criteria**
  - Erythema marginatum
  - Chorea
  - Fever
  - Arthralgia
  - Laboratory findings (elevated ESR, CRP, leukocytosis)
  - Prolonged PR interval on ECG
  - Past history of rheumatic fever

The disease may be preceded 1 – 3 weeks by any streptococcal infection.

**Diagnosis**
- History of streptococcal pharyngitis (scarlet fever, otitis media or erysipelas) 2 or 3 weeks before
- Raising titre of antistreptolysin O titre which indicate recent streptococcal infection
- By Jones criteria; 2 major or 1 major 2 minors

**Prevention**

**Primary prevention**
- General prevention of streptococcal infection: sanitary environment, sanitary houses, good ventilation, prevention of overcrowdness, milk sanitation; health promotion and health education
- Adequate and proper therapy of streptococcal infection: penicillin is the drug of choice for 10 – 14 days

**Secondary prevention**
- Control of first attack ARF by bed rest and drug (anti-inflammatory agents and steroids depending on severity of illness)
- Prevent repeated attack of ARF: benzathine prenicillin chemoprophylaxis, erythromycin in penicillin allergic cases

**Tertiary prevention (cases with RHD)**
- Continue prevention of repeated attack of RF as above
- Special care during any minor operation to protect against subacute bacterial endocarditis
- Follow up and periodic examination
- Rehabilitation, social, educational physical and psychological
- Surgical interference if indicated for valves of the heart

**Elimination RF from school**
- Culture of the throats of all children
- Identify infected individuals
- Exclude from school until a negative culture is obtained