

# **GROUP A STREPTOCOCCAL INFECTIONS**

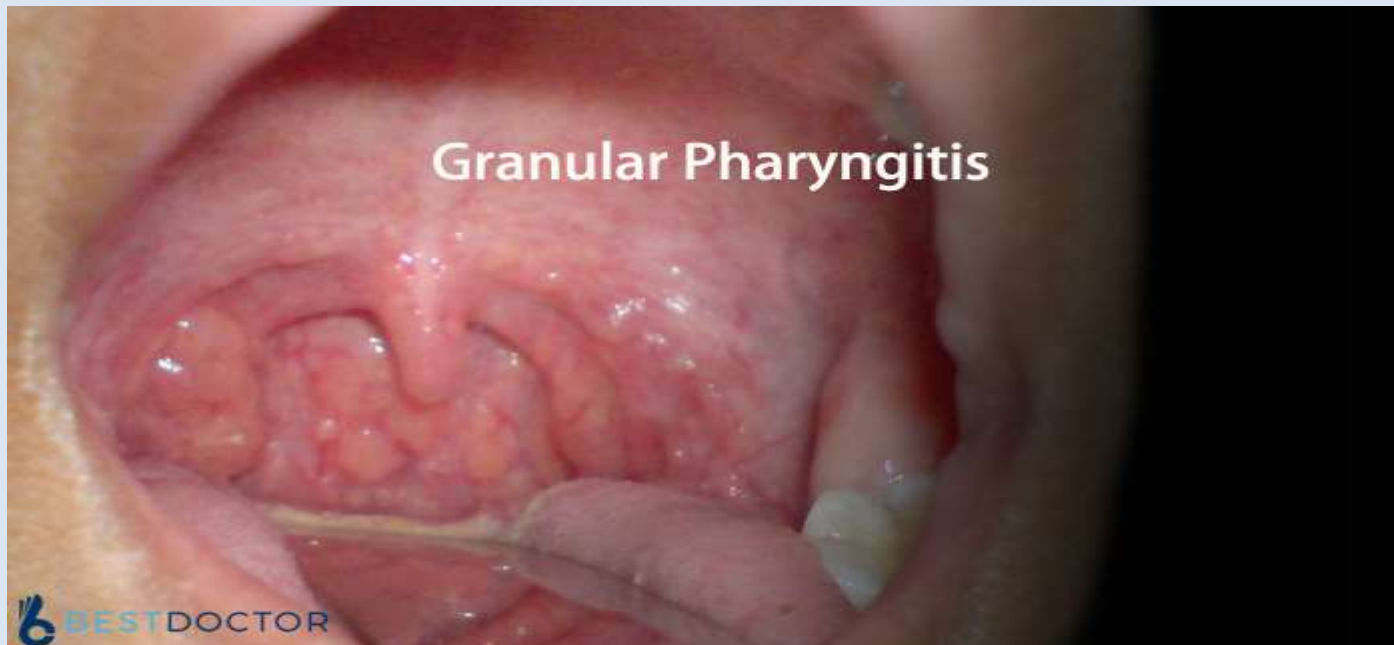
*(Streptococcus pyogenes)*

# INTRODUCTION

- Group A *Streptococcus pyogenes* (GAS) is a gram-positive bacterium that grows in pairs or chains and causes complete or -hemolysis when cultured on sheep blood agar.
- GAS cause a broad spectrum of disease, from primary upper respiratory tract and skin infections to secondary complications such as acute rheumatic fever (ARF) and glomerulonephritis, as well as severe invasive illness, including toxic shock syndrome (TSS) and necrotizing fasciitis which may involve almost every organ system.

# PHARYNGITIS

- GAS pharyngitis, the most common GAS infection, occurs most often in school-age children and accounts for 15% to 30% of all cases of pharyngitis in this age group.



# Scarlet fever

- Scarlet fever, characterized by a diffuse, erythematous.



- Scarlet fever is caused by erythrogenic toxin-producing strains of GAS and may manifest desquamation after the rash starts to fade.
- Exudative pharyngitis may occur, but this finding also is common with viral pharyngitis.
- In children younger than 3 years, an atypical symptom complex like nasal congestion, rhinorrhea, low-grade fever, and anterior cervical lymphadenopathy.
- In infants, the only symptoms may be low-grade fever, and decreased feeding.

# SKIN INFECTIONS

- Skin is the second most common site of GAS infection.
- In general, the characteristic features of GAS skin infection are profuse edema, rapid spread through tissue planes, and dissemination through lymphatic or hematogenous routes.
- The common skin disorders observed are: **impetigo, erysipelas and cellulitis.**

# impetigo, erysipelas and cellulitis



# Streptococcal Non Suppurative Complications

- These include:
  - **Rheumatic fever**
  - Post-streptococcal Glomerulonephritis
  - Streptococcal Toxic Shock Syndrome
  - Pediatric Autoimmune Neuropsychiatric Disorder Associated With Group A Streptococci
  - Necrotizing Fasciitis



# Streptococcal Non Suppurative Complications



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# Necrotizing Fasciitis



# RHEUMATIC FEVER

- ARF is caused by previous GAS pharyngeal infection, with a latent period of 2 to 4 weeks.
- The disorder is most common among children ages 5 to 15 years.
- Currently, most cases of ARF occur in developing countries.

# Post streptococcal Glomerulonephritis

- Poststreptococcal glomerulonephritis (PSGN) is the most common cause of acute nephritis worldwide.
- PSGN is caused by previous throat or skin infection with nephritogenic strains of GAS.
- Although the exact mechanism is unclear, antigens of nephritogenic streptococci are believed to induce immune complex formation in the kidneys.
- The latent period is 1 to 3 weeks following GAS pharyngitis and 3 to 6 weeks following GAS skin infection.
- Deposition of GAS nephritogenic antigens within the glomerular subendothelium leads to glomerular immune complex formation, which triggers complement activation and subsequent inflammation; deposition within the glomerular subepithelium leads to epithelial cell damage and subsequent proteinuria.

# Streptococcal Toxic Shock Syndrome

- GAS TSS is a form of invasive GAS disease associated with the acute onset of shock and organ failure.
- The pathogenesis of GAS TSS is believed to be mediated by streptococcal exotoxins that act as super antigens, which activate the immune system.
- The resultant release of cytokines causes capillary leak, leading to hypotension and organ damage.
- GAS TSS typically presents with fever and the abrupt onset of severe pain, often associated with soft-tissue infection such as cellulitis.
- GAS TSS also may present in association with other invasive GAS diseases such as necrotizing fasciitis, bacteremia, pneumonia, osteomyelitis, myositis, or endocarditis.