

# pharyngitis

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# Pharyngitis

- ▶ **inflammation of the pharynx,**
- ▶ erythema, edema, exudates, or an enanthem (ulcers, vesicles).
  
- ▶ Pharyngeal inflammation can be related to
- ▶ **environmental exposures, such as tobacco** smoke, air pollutants, allergens; from contact with caustic substances, hot food, and liquids;
- ▶ and from infectious agents.

# inflammatory conditions

- ▶ periodic fever, aphthous stomatitis, pharyngitis, adenitis (PFAPA) syndrome,
- ▶ Kawasaki disease,
- ▶ inflammatory bowel disease (IBD),
- ▶ StevensJohnson syndrome,
- ▶ and systemic lupus erythematosus (SLE)

# Noninfectious etiologies

- ▶ **Noninfectious etiologies** are typically evident from **history and physical exam**,
- ▶ but it can be **more challenging** to distinguish from among the numerous
- ▶ infectious causes of acute pharyngitis.

# Acute infections of the upper respiratory tract

- ▶ account for a substantial number of visits to pediatricians
- ▶ many feature sore throat :symptom
- ▶ evidence of **pharyngitis on physical examination.**
- ▶
- ▶ The usual clinical task is to distinguish important,
- ▶ potentially serious, and treatable causes of acute pharyngitis from those that are self-limited and require no specific treatment or follow-up.
- ▶ Specifically, identifying patients who have **group A streptococcus(GAS)**; Streptococcus pyogenes;

# INFECTIOUS ETIOLOGIES

## Viruses

North America and most industrialized countries

is the most important bacterial cause of acute pharyngitis,

viruses predominate as acute infectious causes of pharyngitis.

viruses,

respiratory syncytial virus (RSV),

measles virus,

Epstein-Barr virus (EBV),

herpes simplex virus (HSV),

human metapneumovirus (HMP)

# Viruses

- ▶ Most viral pharyngitis, except mononucleosis, **is mild**.
- ▶ Common nonspecific symptoms such as rhinorrhea and cough develop gradually before they become prominent.
- ▶ However, specific findings are sometimes helpful in identifying the
- ▶ infectious viral agent.

# Gingivostomatitis

- ▶ Gingivostomatitis and ulcerating vesicles throughout the anterior
- ▶ pharynx and on the lips and perioral skin are seen in primary oral HSV
- ▶ infection.
- ▶ High fever and difficulty taking oral fluids are common.
- ▶ This infection can last for 14 days.

# herpangina

- ▶ Discrete papulo vesicular lesions or ulcerations in
- ▶ the posterior oropharynx, severe throat pain, and fever are characteristic of herpangina; enteroviruses.
- ▶ In hand-foot-mouth disease, there are vesicles or ulcers throughout the oropharynx, vesicles on the palms and soles, and sometimes on the trunk and extremities.
- ▶ Coxsackie A16 is the most common agent, but Enterovirus 71 and Coxsackie A6 can also cause this syndrome.
- ▶ Enteroviral infections are most common in the summer.

# herpangina



# adenoviruses

- ▶ Various adenoviruses cause pharyngitis.
- ▶ When there is concurrent conjunctivitis, the syndrome is called
- ▶ **pharyngoconjunctival fever.**
- ▶ The pharyngitis tends to resolve within 7 days but
- ▶ conjunctivitis may persist for up to 14 days.
- ▶ Pharyngoconjunctival fever can be epidemic or sporadic; outbreaks have been associated with exposure in swimming pools.

# pharyngoconjunctival fever



# VIRUSE

- ▶ Intense, diffuse pharyngeal erythema and Koplik spots, the pathognomonic enanthem, occur in advance of the characteristic rash of **measles**.
- ▶ Splenomegaly, lymphadenopathy, or hepatomegaly may be the clue to
- ▶ **EBV infectious mononucleosis** in an adolescent with exudative tonsillitis.
- ▶ Primary infection with **HIV** can manifest as the acute retroviral
- ▶ syndrome, with non-exudative pharyngitis, fever, arthralgia, myalgia,
- ▶ adenopathy, and often a maculopapular rash

# EBV infectious mononucleosis



# Bacteria pharyngitis

- ▶ In addition to GAS, bacteria that cause pharyngitis include group C
- ▶ and group G streptococcus,
- ▶ *Arcanobacterium haemolyticum*,
- ▶ *Francisella tularensis*,
- ▶ *Neisseria gonorrhoeae*,
- ▶ *Mycoplasma pneumoniae*,
- ▶ *Chlamydomphila*
- ▶ (formerly *Chlamydia*) *pneumoniae*,
- ▶ *Chlamydia trachomatis*,
- ▶ *Fusobacterium necrophorum*, and *Corynebacterium diphtheriae*.

# streptococcal pharyngitis

- ▶ highest in children 5-15 yr of age,
- ▶ during winter and early spring.
- ▶ airborne salivary droplets and nasal discharge.
- ▶ close proximity; therefore schools, military barracks, and homes
- ▶ The incubation period :2-5 days.
- ▶ outbreaks of disease in the daycare setting.
- ▶ Foods contaminated by GAS: explosive outbreaks of pharyngotonsillitis.
- ▶ no longer infectious : 24 hr of starting appropriate antibiotic therapy.
- ▶ Chronic pharyngeal carriers of GAS rarely transmit this organism to others

# **PATHOGENESIS**

- ▶ Virulence of GAS depends primarily on **the M protein**
- ▶ protecting against infection with a homologous M type
- ▶ multiple GAS infections attributable to various M types  
:common during childhood and adolescence
- ▶ **Exotoxins: A, C, and SSA, alone or in combination**
- ▶ **GAS can produce up to 12 different pyrogenic**

# **PATHOGENESIS**

- ▶ streptolysin O (anti-streptolysin O) and DNase B (anti-DNase B)
  - ▶ not confer immunity.
  - ▶ recent streptococcal infection
- the diagnosis of postinfectious illnesses.



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# Scarlet Fever

- ▶ GAS pharyngitis +rash
- ▶ pyrogenic exotoxin(erythrogenic toxin)-producing GAS in individuals who do not have antitoxin antibodies

# Scarlet Fever

- ▶ **The rash** : 24-48 hr after onset of symptoms, although it may appear with the first signs of illness
- ▶ begins around the neck and spreads over the trunk and extremities.
- ▶ diffuse, **finely papular, erythematous**
- ▶ Pastia lines.
- ▶ goose-pimple appearance and feels rough.
- ▶ The cheeks are often erythematous with pallor around the mouth.
- ▶ After 3-4 days, the rash :desquamation:
- ▶ mild sunburn.
- ▶ around the free margins of the fingernails, the palms, and the soles.

# Scarlet Fever

- ▶ the pharynx : GAS pharyngitis.
- ▶ In addition: tongue a strawberry appearance.

# Scarlet Fever

- ▶ **Typical scarlet fever** is not difficult to diagnose;
- ▶ **the milder form** with equivocal pharyngeal findings
- ▶ viral exanthems,
- ▶ Kawasaki disease
- ▶ , and drug eruptions.
- ▶ Staphylococcal infections
- ▶ A history of recent exposure to a GAS infection is helpful.
- ▶ Identification of GAS in the pharynx **confirms** the.

# Scarlet Fever



# DIAGNOSIS:

- ▶ When deciding whether to perform a diagnostic test on a patient presenting with acute pharyngitis, the clinical and epidemiologic findings
- ▶ close contact with a well-documented case of GAS pharyngitis is helpful,
- ▶ as is an awareness of a high prevalence of GAS infections in the community. The signs and symptoms of
- ▶ streptococcal and nonstreptococcal pharyngitis overlap too broadly to
- ▶ allow the requisite diagnostic precision on clinical grounds alone. The
- ▶ clinical diagnosis of GAS pharyngitis cannot be made with reasonable
- ▶ accuracy even by the most experienced physicians, and laboratory
- ▶ confirmation is required, except :overt viral signs and
- ▶ symptoms (e.g., rhinorrhea, cough, mouth ulcers, hoarseness), who
- ▶ generally do not need a diagnostic test performed

# Culture

Culture of a throat swab on a sheep blood agar plate is effective

confirming the clinical sensitivity of 90-95% GAS in the pharynx.

The significant **disadvantage** :the delay (overnight or longer)

# *Streptococcal rapid antigen*

- ▶ GAS directly from throat swabs.
- ▶ Their advantage :often <10-15 min. Rapid
- ▶ can reduce the risk for spread of GAS
- ▶ return to school or work sooner,
- ▶ reduce the acute morbidity
- ▶ excellent specificity of >95%

# *Streptococcal rapid antigen*

- ▶ False-positive test results :unusual,
- ▶ therapeutic decisions can be made : positive test
- ▶ , the sensitivity :is 80-90%, a negative rapid test does not completely exclude the presence of GAS:
- ▶ throat culture should be performed.

# The isothermal loop amplification methods

- ▶ sensitivity up to 100% and specificity >96%
- ▶ **very high sensitivity** may lead to higher numbers of positive results,
- ▶ identification of more patients with asymptomatic GAS colonization and **unnecessary antibiotic therapy**.
- ▶ However, the benefit of faster results, sometimes <10 min, ensures more expedited initiation of appropriate antibiotic therapy for patients with GAS pharyngitis

# anti-streptolysin o

- ▶ retrospectively an elevated or increasing streptococcal antibody titer.
- ▶ The anti-streptolysin o
- ▶ Because streptolysin O
- ▶ groups C G streptococci,
- ▶ the test is not specific for group A infection.
- ▶ the anti-DNase B :after either skin or throat infections.
- ▶ an increase in titer of 2 or more dilution increments ( $\geq 4$ -fold rise)
- ▶ between the acute-phase and convalescent-phase specimens

# Streptozyme

Both the traditional anti-streptolysin O and the anti-DNase B tests are **neutralization** assays.

- ▶ Newer tests use latex **agglutination** or nephelometric assays: not been well standardized :
- ▶ the Streptozyme test (Wampole Laboratories, Stamford, CT).
- ▶ This test is much less well standardized and less reproducible than other antibody tests,
- ▶ should not be used as a test for evidence of a preceding
- ▶ GAS infection.

# Bacteria Other Than Group A Streptococcus

- ▶ Haemophilus influenzae and Streptococcus pneumoniae may be cultured from the throats of children with pharyngitis, but their role in causing pharyngitis has not been established.

# Bacteria Other Than Group A Streptococcus

- ▶ Group C and Group G streptococcus and *A. haemolyticum* pharyngitis
- ▶ have been diagnosed **most commonly in adolescents and adults**. They
- ▶ resemble group A  $\beta$ -hemolytic streptococcus (GAS) pharyngitis. A
- ▶ scarlet fever-like rash may be present with *A. haemolyticum* infections.

# Bacteria Other Than Group A Streptococcus

- ▶ **F. necrophorum** has been suggested to be a fairly common cause of
- ▶ pharyngitis in older adolescents and adults (15-30 yr old).  
Prevalence
- ▶ in studies has varied from **10% to 48% of patients with non-GABHS**
- ▶ **pharyngitis**, but large surveillance studies have not been performed. F.
- ▶ necrophorum was detected **by PCR in 20.5%** of patients with pharyngitis
- ▶ in a study based in a university health clinic and in 9.4% of an
- ▶ asymptomatic convenience sample; some patients had more than 1
- ▶ bacterial species detected by PCR.

# Lemierre syndrom,

- ▶ internal jugular vein septic thrombophlebitis.
- ▶ Approximately 80% of cases of
- ▶ Lemierre syndrome are caused by this bacterium.
- ▶ Patients present initially with fever, sore throat, exudative pharyngitis, and/or peritonsillar abscess.
- ▶ The symptoms may persist, neck pain and swelling develop, and the
- ▶ patient appears toxic.
- ▶ Septic shock may ensue, along with metastatic complications from septic emboli that can involve the lungs, bones and joints, central nervous system, abdominal organs, and soft tissues. fatality rate is 4-9%.
- ▶

# Bacteria Other Than Group A Streptococcus

- ▶ **Gonococcal pharyngeal** infections are usually **asymptomatic but can**
- ▶ **cause acute ulcerative or exudative pharyngitis** with fever and cervical
- ▶ lymphadenitis. Young children with proven gonococcal disease should
- ▶ be **evaluated for sexual abuse.**

# Bacteria Other Than Group A Streptococcus

- ▶ Diphtheria is extremely rare in most developed countries due to
- ▶ extensive immunization with diphtheria toxoid. However, it remains
- ▶ endemic in many areas of the world, including the former Soviet bloc
- ▶ countries, Africa, Asia, the Middle East, and Latin America. It can be
- ▶ considered in patients with **recent travel to or from these areas and in**
- ▶ **unimmunized patients.**
- ▶ **Key physical findings are bull neck (extreme neck swelling)** and a gray pharyngeal pseudomembrane that can cause respiratory obstruction.

# Bacteria Other Than Group A Streptococcus

- ▶ Ingestion of water, milk, or undercooked meat contaminated by F.
- ▶ Tularensis can lead to oropharyngeal tularemia. Severe throat pain,
- ▶ tonsillitis, cervical adenitis, oral ulcerations, and a pseudomembrane
- ▶ (as in diphtheria) may be present.
- ▶ *M. pneumoniae* and *C. pneumoniae*
- ▶ cause pharyngitis, **but other upper and lower respiratory** infections are
- ▶ more important and more readily recognized.

# differential Diagnosis acute pharyngitis

- ▶ **Viruses are the most common**
- ▶ Respiratory viruses : influenza virus, parainfluenza virus, rhinovirus, coronavirus, adenovirus, and respiratory syncytial virus : frequent
- ▶ . Other viral : enteroviruses and herpes simplex virus.
- ▶ Epstein-Barr virus : is often accompanied (e.g., splenomegaly, generalized lymphadenopathy).
- ▶ Systemic infections with other viral agents,
- ▶ including cytomegalovirus, rubella virus, measles virus, and HIV, may
- ▶ be associated with acute pharyngitis

# bacterial pharyngitis

- ▶ GAS is far the most common ( 15-30%)
- ▶ Groups C and G  $\beta$ -hemolytic streptococcus
- ▶ Arcanobacterium haemolyticum and Fusobacterium
- ▶ necrophorum are common causes.
- ▶ Neisseria gonorrhoea (sexually active adolescents. )
- ▶ Francisella tularensis and Yersinia enterocolitica,
- ▶ as well as mixed infections with anaerobic bacteria (Vincent angina),
- ▶ are **rare** causes of acute pharyngitis.

# bacterial pharyngitis

- ▶ Chlamydia pneumoniae and
- ▶ Mycoplasma pneumoniae have been implicated
- ▶ . Corynebacterium diphtheriae is a serious cause of pharyngitis but is rare (immunization )
  
- ▶ **S. aureus, Haemophilus influenzae, Streptococcus pneumoniae**) are frequently cultured from the
- ▶ throats of children with acute pharyngitis, their etiologic role in
- ▶ **pharyngitis has not been established, because they are often isolated in**
- ▶ **healthy children.**

# bacterial pharyngitis

- ▶ GAS pharyngitis is the **only common cause of acute pharyngitis** for
- ▶ **which antibiotic therapy** is definitely indicated. Therefore, when confronted with a patient with acute pharyngitis, the clinical decision that usually needs to be made is whether or not the pharyngitis is attributable to GAS

# COMPLICATIONS AND PROGNOSIS

- ▶ **Viral respiratory** tract infections can predispose to
- ▶ bacterial middle ear
- ▶ infections and bacterial sinusitis.

# The complications of GAS pharyngitis

- ▶ include local suppurative complications,
- ▶ such as parapharyngeal abscess,
- ▶ and subsequent nonsuppurative illnesses,
- ▶ such as **ARF**, **APSGN**,
- ▶ poststreptococcal reactive arthritis,
- ▶ and **possibly PANDAS** (pediatric autoimmune neuropsychiatric disorders associated with streptococci)
- ▶ **CANS** [childhood acute neuropsychiatric symptoms] or
- ▶ **PANS** [pediatric acute-onset neuropsychiatric syndrome],
- ▶ recognizing that many infections other than GAS may predispose to
- ▶ these syndromes).

## در کودک بالای دو سال، گلودرد را ارزیابی کنید.

علائم و نشانه ها	طبقه بندی	تشخیص نوع درمان
<ul style="list-style-type: none"> <li>در صورت وجود تب و التهاب حلق و کمتر از ۴ نشانه عفونت ویروسی*</li> <li>یا با بدون یکی از نشانه های زیر</li> <li>• آگزودای حلق</li> <li>• لنفادنویاتی گردنی</li> <li>• بیثورت سینه ای (مخملک)</li> </ul>	گلو درد استرپتوکوکی دارد	<ul style="list-style-type: none"> <li>• یک نوبت بنزاتین بنی سیلین G عضلانی تزریق کنید:</li> <li>• ۶۰۰۰۰۰ واحد (۶,۰۰۰,۰۰۰) در صورتی که کودک کمتر از ۲۷ کیلوگرم باشد.</li> <li>• ۱۲۰۰۰۰۰ واحد (۱,۲۰۰,۰۰۰) در صورتی که کودک ۲۷ کیلوگرم یا بیشتر باشد.</li> <li>• در تب مساوی یا بالاتر از ۳۸/۵ درجه سانتیگراد، استامینوفن بدهید (س ۱).</li> <li>• به مادر توصیه کنید چه زمانی فوراً برگردد.</li> <li>• به مادر توصیه کنید در صورت عدم بهبودی، ۲ روز بعد مراجعه کند.</li> </ul>
<ul style="list-style-type: none"> <li>• دو یا بیشتر از نشانه های عفونت ویروسی</li> <li>• زیرا داشته باشد:</li> <li>• آب ریزش بینی یا عطسه</li> <li>• قرمزی چشم</li> <li>• سرفه</li> <li>• خشونت صدا</li> <li>• آفت دهانی</li> </ul>	گلو درد استرپتوکوکی ندارد	<ul style="list-style-type: none"> <li>• اگر در طبقه بندی دیگری قرار دارد اقدامات آن طبقه بندی را انجام دهید در غیر درمانی لازم نیست.</li> <li>• از اقدامات بی ضرر خانگی یا اقدامات غیر دارویی استفاده کنید (س ۱).</li> <li>• به مادر توصیه کنید چه زمانی فوراً برگردد.</li> <li>• به مادر توصیه کنید در صورت عدم بهبودی، ۲ روز بعد مراجعه کند.</li> </ul>

طبقه بندی کنید

اگر کودک (۲ سال به بالا) گلودرد دارد. (کودک در زمان غذا خوردن مشکل دارد)
سوال کنید:
<ul style="list-style-type: none"> <li>• آیا کودک تب دارد؟</li> <li>• آیا کودک آبریزش بینی دارد؟</li> <li>• آیا کودک سرفه می کند؟</li> <li>• آیا قرمزی چشم دارد؟</li> <li>• آیا عطسه می کند؟</li> <li>• آیا خشونت صدا دارد؟</li> <li>• آیا آفت دهانی دارد؟</li> </ul>
معاینه و بررسی کنید:
<ul style="list-style-type: none"> <li>• حلق را از نظر قرمزی، التهاب و آگزودا نگاه کنید.</li> <li>• پوست را از نظر بیثورات جلدی بررسی کنید</li> <li>• گردن را از نظر لنفادنویاتی لمس کنید </li> <li>• دمای بدن کودک را اندازه گیری کنید.</li> </ul>

۱. نشانه های عفونت ویروسی: آب ریزش بینی یا عطسه، قرمزی چشم، سرفه، خشونت صدا، آفت دهانی



# treatment

- ▶ Antibiotic therapy for patients with GAS pharyngitis can
- ▶ prevent acute rheumatic fever(RF)
- ▶ shorten the clinical course of the illness,
- ▶ reduce transmission of the infection to others,
- ▶ and prevent suppurative complications.

# Systemic corticosteroids

- ▶ are sometimes used in children who
- ▶ have evidence of upper airway compromise due to mononucleosis.
- ▶ Although corticosteroids are used commonly **in adults** with pharyngitis,
- ▶ large-scale studies capable of providing safety and efficacy data are
- ▶ lacking in children
- ▶ *Corticosteroids cannot be recommended for treatment of most pediatric pharyngitis.*

# Early antibiotic therapy

- ▶ **Most untreated** episodes of GAS pharyngitis resolve uneventfully
- ▶ within a few days,
- ▶ but early antibiotic therapy hastens clinical recovery
- ▶ by **12-24 hr** and also
- ▶ reduces **suppurative complications of GAS pharyngitis such as peritonsillar abscess and cervical adenitis.**
- ▶ The primary benefit and intent of antibiotic treatment is the prevention of acute
- ▶ rheumatic fever (ARF); it **is highly effective when started within 9 days**
- ▶ of onset of illness.
- ▶ Antibiotic therapy does not prevent acute poststreptococcal glomerulonephritis (**APSGN**).

# Early antibiotic therapy

- ▶ but early antibiotic therapy for children with
- ▶ symptomatic pharyngitis and a positive test for GAS.
- ▶ Presumptive antibiotic treatment can be started when
- ▶ there is a clinical diagnosis of
- ▶ scarlet fever,
- ▶ a symptomatic child has a household contact with documented streptococcal pharyngitis,
- ▶ is a history of ARF in the patient or a family member,
- ▶ but *a diagnostic test should be performed to confirm the presence of GAS and antibiotics should be discontinued* if GAS are not identified

# antibiotic therapy

- ▶ **classic scarlet fever**, antibiotic therapy should be started immediately,
- ▶ majority: much less distinctive findings, treatment should be withheld
- ▶ until there is laboratory confirmation,
- ▶ by throat culture, molecular assay, or rapid antigen detection test.
- ▶ Rapid antigen detection tests antibiotic therapy immediately : patient with a positive test result

# antibiotic therapy

- ▶ GAS is exquisitely sensitive to penicillin and cephalosporins,
- ▶ Penicillin or amoxicillin : drug of choice
- ▶ (except in patients who are allergic to penicillins)
- ▶ oral therapy is the **risk** that the drug will be **discontinued** before the 10-day course has been completed.
- ▶ **a full course of therapy must be emphasized**

# benzathine penicillin G

- ▶ parenteral therapy with a single intramuscular (IM) injection of benzathine penicillin
- ▶ (600,000 IU for children weighing  $\leq 60$  lb
- ▶ 1.2 million IU for children  $> 60$  lb)
  
- ▶ the most efficacious and **often the most practical method of treatment.**
- ▶ **Disadvantages** include **soreness**
- ▶ injection into nerves or blood
- ▶ local reaction is diminished
- ▶ procaine penicillin G.

- ▶ once-daily amoxicillin (50 mg/kg, maximum: 1,000 mg) for 10 days has been demonstrated to be
- ▶ effective in treating GAS pharyngitis. This somewhat broader-spectrum
- ▶ agent has the **advantage of once-daily dosing**, which may enhance
- ▶ adherence. In addition, amoxicillin **is relatively inexpensive** and is
- ▶ considerably more palatable than penicillin V suspension.

# oral cephalosporin

- ▶ a 10-day course with an oral cephalosporin(1st-generation cephalosporin (cephalexin or cefadroxil) is superior to 10 days of oral penicillin in eradicating GAS from the pharynx. Analysis of
- ▶ these data suggests that the difference in eradication is mainly the result
- ▶ of a higher rate of eradication of carriers included unintentionally in
- ▶ these clinical trials. Some penicillin-allergic persons (up to 10%) are
- ▶ also allergic to cephalosporins, and these agents should be avoided in
- ▶ patients with immediate (anaphylactic-type) hypersensitivity to penicillin.
- ▶ Most oral broad-spectrum cephalosporins are considerably more
- ▶ **expensive** than penicillin or amoxicillin and are more likely to select
- ▶ for antibiotic-resistant flora

# Oral clindamycin

- ▶ **Oral clindamycin** is an appropriate agent for treating penicillin-allergic
- ▶ patients, and resistance to clindamycin among GAS isolates in the
- ▶ United States is currently only approximately 1%

# macrolide

- ▶ An oral macrolide(erythromycin or clarithromycin) or azalide(azithromycin) is also
- ▶ an appropriate agent for patients allergic to penicillins.
- ▶ Ten days of is indicated except for azithromycin, which is given at 12 mg/
- ▶ kg once daily for 5 days.
- ▶ **Erythromycin is associated with substantially**
- ▶ **higher rates of gastrointestinal side effects** than the other agents. In
- ▶ recent years, macrolide resistance rates among pharyngeal isolates
- ▶ of GAS in most areas of the United States have been approximately
- ▶ **5-8%.**
- ▶ Sulfonamides and the tetracyclines fluoroquinolones are not recommended
- ▶ for treatment of GAS pharyngitis.

# CHRONIC GROUP A STREPTOCOCCUS CARRIERS

- ▶ Streptococcal carriers are patients who continue to harbor GAS in
- ▶ the pharynx despite appropriate antibiotic therapy or when they are
- ▶ well. They have little or no evidence of an inflammatory response to
- ▶ the organism. The pathogenesis of chronic carriage is not known; it
- ▶ is assuredly not related to penicillin resistance or nonadherence to
- ▶ therapy, and there is little direct evidence to support the concept of

- ▶ their families and physicians. It is usually unnecessary to attempt to
- ▶ eliminate chronic carriage.
- ▶ Expert opinion suggests that eradication might be attempted in select circumstances:
  - ▶ a community outbreak of ARF or APSGN;
  - ▶ personal or family history of ARF;
  - ▶ an outbreak of GAS pharyngitis in a closed or semiclosed community, nursing home, or healthcare facility; repeated episodes of symptomatic GAS pharyngitis

Clindamycin given by mouth for 10 days is effective

- ▶ therapy (20 mg/kg/day divided in 3 doses; adult dose 150-450 mg tid).
- ▶ Amoxicillin-clavulanate (40 mg amoxicillin/kg/day up to 2,000 mg
- ▶ amoxicillin/day divided tid for 10 days),
- ▶ and 4 days **of oral rifampin (20 mg/kg/day** up to 600 mg divided in 2 doses) plus either intramuscular benzathine penicillin given once or
- ▶ oral penicillin given for 10 days have
- ▶ also been used

# Tonsillectomy

- ▶ may lower the incidence of pharyngitis for 1-2 yr among
- ▶ children with
- ▶ frequent episodes of documented pharyngitis ( $\geq 7$  episodes
- ▶ in the previous year
- ▶ or  $\geq 5$  in each of the preceding 2 yr,
- ▶ or  $\geq 3$  in each of the previous 3 yr).
- ▶ However, the frequency of pharyngitis (GAS and non-GAS) generally declines over time.

# Recurrent GAS pharyngitis

- ▶ By 2 yr posttonsillectomy, the
- ▶ incidence of pharyngitis in severely affected children **is similar among**
- ▶ those who have **tonsillectomy** and those who do not. Few children are
- ▶ so severely affected, and the limited clinical benefit of tonsillectomy for
- ▶ **most must be balanced against the risks of anesthesia and surgery.**
- ▶ Undocumented history of recurrent pharyngitis is an inadequate basis
- ▶ for recommending tonsillectomy.

# Recurrent GAS pharyngitis

- ▶ Recurrent GAS pharyngitis is rarely, if ever, a sign of an immune disorder. However, recurrent pharyngitis can be part of a recurrent fever or autoinflammatory syndrome such as PFAPA syndrome.
- ▶ Prolonged pharyngitis (>1 wk) can occur in infectious mononucleosis and Lemierre syndrome, but it also suggests the possibility of another disorder such as neutropenia, a recurrent fever syndrome, or an autoimmune disease such as SLE or IBD. In such instances, pharyngitis would be 1 of a number of clinical findings that together should suggest the underlying diagnosis

# PREVENTION

- ▶ Vaccines intended to prevent infection with various viruses (e.g., RSV)

- ▶ Antimicrobial prophylaxis

with daily oral penicillin prevents recurrent GAS infections but is recommended only to prevent recurrences of ARF.

# Herpes gingivostomatitis

- ▶ Herpes gingivostomatitis is most often affects children 6 mo to 5 yr of
- ▶ age but is seen across the age spectrum. It is an extremely painful
- ▶ condition with sudden onset, pain in the mouth, drooling, refusal to
- ▶ eat or drink, and fever of up to 40.0-40.6°C (104-105.1°F).
- ▶ The gums become markedly swollen, and vesicles may develop throughout the
- ▶ oral cavity, including the gums, lips, tongue, palate, tonsils, pharynx,
- ▶ and perioral skin .
- ▶ The vesicles may be more extensively distributed than typically seen with enteroviral herpangina. During the
- ▶ initial phase of the illness there may be tonsillar exudates suggestive of
- ▶ bacterial pharyngitis.



# Herpes gingivostomatitis

- ▶ The vesicles are generally present only a few days
- ▶ before progressing to form shallow indurated ulcers that may be covered with a yellow-gray membrane.
- ▶ Tender submandibular, submaxillary, and cervical lymphadenopathy is common.
- ▶ The breath may be foul as a result of overgrowth of anaerobic oral bacteria.
- ▶ Untreated, the illness
- ▶ resolves in, at 7-14 days though the lymphadenopathy may persist for
- ▶ several weeks.

# Herpes gingivostomatitis

- ▶ **In older children, adolescents, and college students**, the initial HSV
- ▶ oral infection may manifest as **pharyngitis and tonsillitis rather than**
- ▶ gingivostomatitis. The vesicular phase is often over by the time the
- ▶ patient presents to a healthcare provider, and signs and symptoms may
- ▶ be indistinguishable from those of streptococcal pharyngitis, consisting
- ▶ of fever, malaise, headache, sore throat, and white plaques on the tonsils.
- ▶ The course of illness is typically longer than for untreated streptococcal
- ▶ pharyngitis.

# Herpes gingivostomatitis

- ▶ For gingivostomatitis,
- ▶ oral acyclovir (15 mg/kg/dose 5 times a day PO
- ▶ for 7 days; maximum: 1 g/day) started within 72 hr of onset reduces
- ▶ the severity and duration of the illness. Pain associated with swallowing
- ▶ may limit oral intake of infants and children, putting them at risk for
- ▶ dehydration. Intake should be encouraged through the use of cold
- ▶ beverages, ice cream, and yogurt

# Angina

Angina is characterized by sudden onset of fever, sore throat, dysphagia, and painful lesions in the posterior pharynx. Temperatures range from normal to 41 °C (106 °F); fever tends to be higher in younger patients. Headache and backache may occur in older children, and **nausea and vomiting and abdominal pain occur in 25% of cases.** Characteristic lesions, present on the anterior tonsillar pillars, soft palate, uvula, tonsils,

# Herpangina

anterior pharyngeal wall, and, occasionally, the posterior buccal surfaces, discrete 1-2 mm vesicles and ulcers that enlarge over 2-3 days to 5 mm and are surrounded by erythematous rings that vary in size up to 10 mm. The number of lesions can range from 1 to >15, but is most commonly around 5. The remainder of the pharynx appears normal

# Herpangina

- ▶ or minimally erythematous. Most cases are mild and have no complications. However, dehydration due to decreased oral intake may occur
- ▶ and some cases are associated with meningitis or more severe illness.
- ▶ Fever generally lasts 1-4 days, and resolution of symptoms occurs in
- ▶ 3-7 days. A variety of enteroviruses cause herpangina, including
- ▶ enterovirus A71, but coxsackie A viruses are implicated most often.