# Acute rheumatic fever

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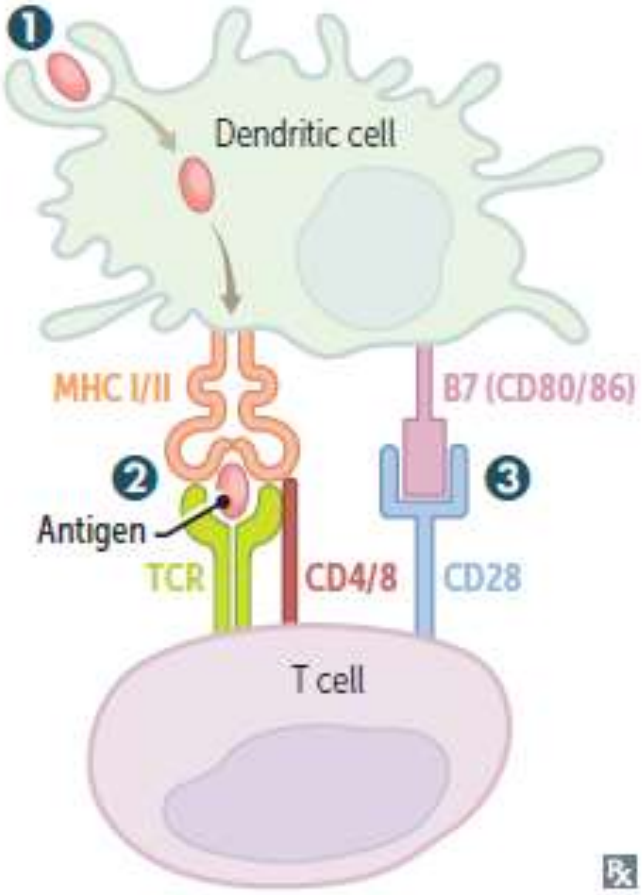
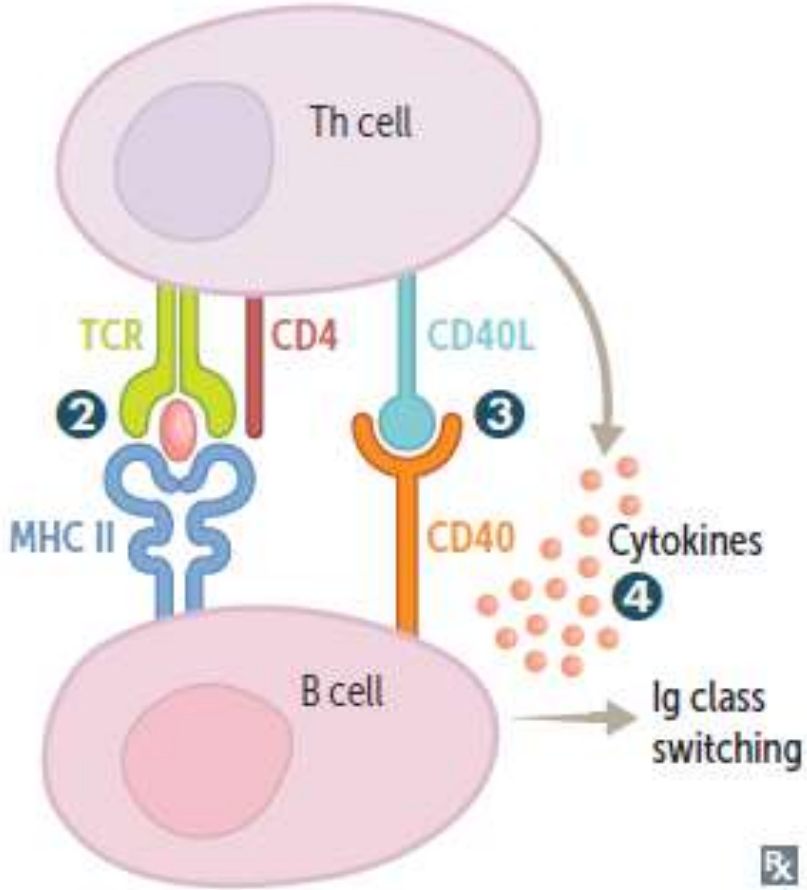
# Acute rheumatic fever

- Untreated group A *Strep* infection
- More common in developing countries(100cases/100,000 population) than in the United States (~2 cases/100,000 population).
  - Occurs only in 3% untreated Gr. A strep infections
- Autoantibodies against heart valves and joints
  - Mitral>Aortic
- Sterile vegetations

# Acute rheumatic fever



# Acute rheumatic fever

- The peak incidence is between ages 5 and 15 years
- Rheumatic carditis and valvulitis may be
  - self-limited
  - slowly progressive valvular deformity.

# Acute rheumatic fever

- H&P
  - History of recent strep infection
  - Jones criteria
    - 2 major
    - 1 major + 2 minor

# Acute rheumatic fever

- **Major criteria**
  - **J**oints
  - **O**(pancarditis, valve damage)
  - **N**odules
  - **E**rythema marginatum ( Painless rash)
  - **S**ydenham chorea

# Acute rheumatic fever

- **Minor criteria**
  - **P**revious rheumatic fever
  - **E**KG with PR prolongation
  - **A**rthralgias
  - **C**RP or ESR elevation
  - **E**levated temprature

# Acute rheumatic fever

- The **clinical profile** of the infection includes
  - carditis in 50–70%
  - arthritis in 35–66%,
  - chorea (10–30% and predominantly in girls)
  - subcutaneous nodules (0–10%)
  - erythema marginatum (in less than 6%).

# Acute rheumatic fever

- Labs
  - ↑ESR and CRP
  - ↑WBC
  - Anti-streptococcal antibodies
- ECG
  - Increased PR interval

# Acute rheumatic fever

- **Treatment**
  - NSAIDs
  - Corticosteroids
  - B-lactams
    - **Penicillin**—Penicillin (benzathine penicillin, 1.2 millionunits intramuscularly once, or procaine penicillin, 600,000 units intramuscularly daily for 10 days) is used to eradicate streptococcal infection if present.
    - **Erythromycin** may be substituted (40 mg/kg/day).

# Acute rheumatic fever

- **Prevention of Recurrent Rheumatic Fever**
  - Improvement in socioeconomic conditions and public health are critical to reducing bouts of rheumatic fever.
  - The initial episode of rheumatic fever can usually be prevented by early treatment of streptococcal pharyngitis with penicillin.

# Acute rheumatic fever

- **Prevention of Recurrent Rheumatic Fever**
- Prevention of recurrent episodes of rheumatic fever is critical.
- Recurrences of rheumatic fever are
  - most common in patients who have had carditis during their initial episode and in
  - children, 20% of whom will have a second episode within 5 years.
  - The preferred method of prophylaxis
    - benzathine penicillin G, 1.2 million units intramuscularly every 4 weeks.
    - Oral penicillin (250 mg twice daily) is less reliable.

# Acute rheumatic fever

- Rheumatic fever patients with valve damage will then need for prophylactic antibiotics before surgery or dental procedures

# Infective endocarditis

# Infective endocarditis

- **ESSENTIALS OF DIAGNOSIS**
  - Fever.
  - Preexisting organic heart lesion.
  - Positive blood cultures.
  - Evidence of vegetation on echocardiography.
  - New or changing heart murmurs.
  - Evidence of  systemic emboli.

# Infective endocarditis

- Endocarditis is a bacterial or fungal infection of the valvular or endocardial surface of the heart.

# Infective endocarditis

- Underlying valvular disease, in about 50% of cases.
- Valvular disease alters blood flow and produces jet effects that disrupt the endothelial surface
- providing a nidus for attachment and infection of microorganisms that enter the bloodstream.

# Infective endocarditis

- **Predisposing valvular abnormalities**
  - Rheumatic involvement of any valve
  - Bicuspid aortic valves
  - Calcific or sclerotic aortic valves
  - Hypertrophic sub-aortic stenosis

# Infective endocarditis

- **Predisposing valvular abnormalities**
- mitral valve prolapse
- congenital disorders
  - ventricular septal defect
  - tetralogy of Fallot
  - coarc-tation of the aorta
  - patent ductus arteriosus.

# Infective endocarditis

- **Predisposing valvular abnormalities**
- Rheumatic disease is no longer the major predisposing factor in developed countries.
- Regurgitation lesions are more susceptible than stenotic ones.

# Infective endocarditis

- The initiating event in native valve endocarditis is colonization of the valve by bacteria or yeast that gain access to the bloodstream.
- Transient bacteremia is common during
  - dental
  - upper respiratory
  - urologic
  - lower gastrointestinal diagnostic and surgical procedures.

# Infective endocarditis

- It is less common
  - upper gastrointestinal and gynecologic procedures.
  - Intravascular devices are increasingly implicated as a portal of access of microorganisms into the bloodstream. A large proportion of cases of S aureus endocarditis

# Infective endocarditis

- Native valve endocarditis is usually caused by
  - Staph. Aureus
  - viridans streptococci
  - enterococci
  - HACEK organisms (Haemophilus aphrophilus [now Aggregati-bacter aphrophilus], Actinobacillus actinomycetemcomitans [now Aggregatibacter actinomycetemcomitans], Cardiobac-terium hominis, Eikenella corrodens, and Kingella species).

# Infective endocarditis

- Gram-negative organisms and fungi account for a small percentage.
- IVDAU
- The microbiology of prosthetic valve endocarditis
  - Early infections (ie, those occurring within 2 months after valve implantation)
    - staphylococci—both coagulase-positive and coagulase-negative
    - gram-negative organisms
    - fungi.
  - In late prosthetic valve endocarditis, streptococci are commonly

# Infective endocarditis

- **Clinical presentation**
  - depends on the infecting organism and the valve or valves that are infected.
- More virulent organisms—
  - Staph. aureus in particular—tend to
    - produce a more rapidly progressive and destructive infection.

# Infective endocarditis

- **Clinical presentation**
  - Acute febrile illnesses and is complicated by early embolization.
  - Acute valvular regurgitation, and myocardial abscess formation.
  - Viridans strains of streptococci, enterococci, other bacteria, yeasts, and fungi tend to cause a more subacute picture.

# Infective endocarditis

- **Clinical presentation**
- Nonspecific symptoms are common.
  - Fever
    - low grade-elderly, with heart failure or kidney failure.
  - Symptoms also may occur as a result of
    - embolization,
    - metastatic infection or
    - immunologically mediated phenomena.
    - cough
    - dyspnea
    - arthralgias
    - arthritis

# Infective endocarditis

- The characteristic peripheral lesions—
  - Petechiae (on the palate or conjunctiva or beneath the fingernails),
  - Subungual (“splinter”) hemorrhages.

# Infective endocarditis

- **Osler nodes** (painful, violaceous raised lesions of the fingers, toes, or feet)
  - Osler node causing pain within the pulp of the big toe
- painless flat Janeway lesions over the sole o
  foot.

# Infective endocarditis

- **Roth spots** (exudative lesions in the retina)—occur in about 25% of patients.
- **Strokes** and major systemic **embolic events** are present in about 25% of patients, and tend to occur before or within the first week of antimicrobial therapy.
- **Hematuria and proteinuria** may result from emboli or immunologically mediated *glomerulonephritis*, which can cause kidney dysfunction.

# Infective endocarditis

## Diagnosis

# Infective endocarditis

- **Chest radiograph**
  - in right-sided endocarditis, pulmonary infiltrates.
- **electrocardiogram** is non-diagnostic
- **Echocardiography**
  - identifying vegetations
- **Transesophageal echocardiography**
  - 90% sensitive in detecting vegetations
  - particularly useful for identifying valve ring abscesses as well as prosthetic valve endocarditis.

# Infective endocarditis

- **Blood cultures**—
  - establish the diagnosis.
  - Three sets of blood cultures at least 1 hour apart before starting antibiotics are recommended to maximize the opportunity for a microbiologic diagnosis.

# Infective endocarditis

- **Modified Duke criteria**
  - **Major criteria**
    - (1) two positive blood cultures for a microorganism that typically causes infective endocarditis or persistent bacteremia.
    - (2) evidence of endocardial involvement documented by echo-cardiography (eg, definite vegetation, myocardial abscess, or new partial dehiscence of a prosthetic valve)
    - (3) development of a new regurgitant murmur.

# Infective endocarditis

- **Minor criteria** include
  - presence of a predisposing condition;
  - fever of 38°C or higher;
  - vascular phenomena,
    - » cutaneous hemorrhages, aneurysm, systemic emboli, pulmonary infarction
  - immunologic phenomena
    - » glomerulonephritis, Osler nodes, Roth spots, rheumatoid factor
  - And positive blood cultures not meeting the major criteria or serologic evidence of an active infection.

# Infective endocarditis

- A definite diagnosis can be made with 80% accuracy if
  - » two major criteria, one major criterion and three minor criteria, or five minor criteria are fulfilled.
  - » A possible diagnosis of endocarditis is made if one major and one minor criterion or three minor criteria are met.
  - » If fewer criteria are found, or a sound alternative explanation for illness is identified, or the patient's febrile illness has resolved within 4 days, endocarditis is unlikely.

# Infective endocarditis

# Treatment

# Infective endocarditis

- **Empiric regimens**
  - while culture results are pending
    - agents active against staphylococci, streptococci, and enterococci.
    - Vancomycin 1 g every 12 hours intravenously plus ceftriaxone 2 g every 24 hours provides appropriate coverage pending definitive diagnosis.
    - Consultation with an infectious disease expert is strongly recommended when initiating treatment for infective endocarditis.

# Infective endocarditis

- **Viridans streptococci**
- penicillin-susceptible viridans streptococcal endocarditis
  - penicillin G, 18 million units intravenously either continuously or in four to six equally divided doses or
  - ceftriaxone 2 g intravenously once daily for 4 weeks

# Infective endocarditis

- **Enterococcal** endocarditis
  - Penicillin or ampicillin with gentamicin
- **HACEK group**
  - Ceftriaxone  2gm i.v once daily for 4 weeks

# Infective endocarditis

- **Role of surgery**
- While many cases can be successfully treated medically.
- Acute heart failure unresponsive to medical therapy valve replacement even if active infection is present.
- Infections unresponsive to appropriate antimicrobial therapy after 7–10 days (ie, persistent fevers, positive blood cultures despite therapy) are more likely to be eradicated if the valve is replaced.
- Surgery is nearly always required for cure of fungal endocarditis and is more often necessary with septal abscess

**Table 33–4.** Recommendations for administration of bacterial endocarditis prophylaxis for patients according to type of procedure.[1]

| Prophylaxis Recommended | Prophylaxis Not Recommended |
|---|---|
| **Dental procedures**<br>All dental procedures that involve manipulation of gingival tissue or the periapical region of the teeth or perforation of the oral mucosa<br>**Respiratory tract procedures**<br>Only respiratory tract procedures that involve incision of the respiratory mucosa<br>**Procedures on infected skin, skin structure, or musculoskeletal tissue** | **Dental procedures**<br>Routine anesthetic injections through noninfected tissue, taking dental radiographs, placement of removable prosthodontic or orthodontic appliances, adjustment of orthodontic appliances, placement of orthodontic brackets, shedding of deciduous teeth, and bleeding from trauma to the lips or oral mucosa<br>**Gastrointestinal tract procedures**<br>**Genitourinary tract procedures** |

# Infective endocarditis

**Table 33–5.** American Heart Association recommendations for endocarditis prophylaxis for dental procedures for patients with cardiac conditions.[1–3]

| | | |
|---|---|---|
| Oral | Amoxicillin | 2 g 1 hour before procedure |
| Penicillin allergy | Clindamycin | 600 mg 1 hour before procedure |
| | or | |
| | Cephalexin | 2 g 1 hour before procedure (contraindicated if there is history of a beta-lactam immediate hypersensitivity reaction) |
| | or | |
| | Azithromycin or clarithromycin | 500 mg 1 hour before procedure |
| Parenteral | Ampicillin | 2 g intramuscularly or intravenously 30 minutes before procedure |
| Penicillin allergy | Clindamycin | 600 mg intravenously 1 hour before procedure |
| | or | |
| | Cefazolin | 1 g intramuscularly or intravenously 30 minutes before procedure (contraindicated if there is history of a beta-lactam immediate hypersensitivity reaction) |