

# Cardiovascular Inflammations and Infections

## Infective Endocarditis

Infective endocarditis is a microbial infection of the endocardium.

It is most often observed in patients who are IV drug abusers, have a history of valve replacement, have a systemic infection, or who have a structural cardiac defect.

A ~~vegetable~~ vegetation occurs on the endocardium when a section of the endocardium becomes eroded and fibrin and platelets then attached to said eroded area. If bacteremia occurs, then bacteria can then deposit onto the vegetation. Additional platelets and fibrin then attach causing the vegetation to grow.

This can then cause valvular insufficiency to occur.

These patients are at a high risk of an emboli being released into the systemic circulation.

### Signs/symptoms

- Murmur (almost all patients will develop a murmur)
- Recurrent fever with chills, fatigue, and night sweats
- Anorexia and weight loss
- Development of heart failure- most common complication
- Petechiae
- Positive blood cultures
- Splinter hemorrhages
- Embolization (if the left side of the heart is involved then the spleen, kidney, GI tract, brain, or extremities can be affected. If the right side of the heart is involved then it will affect the pulmonary system)
  - o Splenic infarction- abdominal pain with radiation to the left shoulder
  - o Renal infarction- flank pain that radiates to the groin + hematuria or pyuria
  - o Mesenteric emboli- diffuse abdominal pain after eating and abdominal distention
  - o Pulmonary- pleuritic chest pain, dyspnea, cough

### Treatment

Antimicrobial therapy- the medication will depend on the organism involved. The therapy will likely last 4-6 weeks and will be administered via the intravenous (IV) route

If antibiotic therapy is not effective, then surgical intervention may be needed. This can include

- Removal of infected biologic or prosthetic valve
- Draining abscesses in the heart
- Repair or removal of congenital shunts
- Repair injured valves and chordae tendinae

## **Nursing Interventions**

Educate the patient and their family on IV antibiotic therapy in the home setting

Educate the patient and their family on how to prevent relapse of endocarditis and how to avoid complications of existing endocarditis

Teach patients and their family how to properly administer IV antimicrobial medications through the PICC line or central catheter

Teach patients and their family proper care of the PICC line or central catheter

Teach patient to maintain proper oral hygiene. Instruct patients to avoid irrigation devices and to avoid flossing their teeth

Teach patients that they will need prophylactic antibiotics before every invasive procedure, especially dental care

Teach patient to report the following to their physician

- Fever, chills, malaise, weight loss
- Increased fatigue
- Sudden weight gain
- Dyspnea

## **Pericarditis**

Pericarditis is inflammation or alteration of the pericardium

### **Acute vs Chronic**

**Acute pericarditis** is mostly associated with

- Respiratory infective organisms
- Post-myocardial infarction
- Post-pericardiotomy syndrome

Signs/symptoms:

- Substernal precordial pain that radiates to left neck, the shoulder, or the back
- Pain is aggravated by breathing, coughing, or swallowing
- Pain is worse in a supine position
- Pericardial friction rub
- Increased white blood cell count + fever
- ST-T spike on ECG

**Chronic constrictive pericarditis** causes a fibrous thickening of the pericardium which is associated with

- Tuberculosis
- Radiation therapy
- Trauma
- Renal failure
- Metastatic cancer

Results in cardiac failure

Signs/symptoms

- Signs of right sided heart failure
- Fatigue and dyspnea

### **Treatment**

Pain management

- NSAIDs for pain- should reduce pain within 24-48 hours
- Sit upright, slightly leaning forward

Various causes of pericarditis will require different therapies

- Bacterial pericarditis will require antibiotic therapy plus pericardial drainage
- Chronic pericarditis related to malignancy will require radiation or chemotherapy
- Uremic pericarditis will require hemodialysis

Chronic pericarditis may require a pericardiectomy

- After a pericardiectomy, the nurse should monitor for pericardial effusion which can result in **cardiac tamponade**
  - o Acute cardiac tamponade can occur when small volumes of fluid accumulate rapidly in the pericardium and result in decreased cardiac output
  - o The nurse may assess the following
    - Jugular vein distention
    - Paradoxical pulse
    - Decreased heart rate
    - Dyspnea, fatigue
    - Muffled heart sounds
    - Hypotension
  - o The patient may need a **pericardiocentesis** to remove the fluid and relieve the pressure on the heart. The patient will also require fluid volume administration to increase the cardiac output
  - o A **pericardial window** may be needed for patients with recurrent tamponade. This involves removing a portion of the pericardium to allow fluid to drain into the pleural space

## **Rheumatic Carditis**

Rheumatic carditis is a sensitivity response that develops after an upper respiratory infection with group A beta-hemolytic streptococci

This results in inflammation in all layers of the heart which leads to impaired contraction, thickening of the pericardium, and valvular damage

#### Characteristics

- Aschoff bodies- small nodules in the myocardium that are replaced by scar tissue
- Diffuse cellular infiltrate
- Thickened pericardium covered with exudate
- Serosanguineous pleural effusion may develop
- Mitral and aortic stenosis or regurgitation results from hemorrhagic and fibrous lesions that form along the valves

#### Signs/symptoms

- Tachycardia
- Cardiomegaly
- New murmur
- Pericardial friction rub
- Precordial pain
- ECG changes- prolonged PR interval
- Heart failure
- Streptococcal infection

#### Treatment

Antibiotic therapy for streptococcal infection

- Penicillin is medication of choice (Erythromycin is medication of choice for patients with a penicillin allergy)
- Teach patient to finish all 10 days of antibiotic therapy to avoid reinfection

Prophylactic antibiotic therapy will be necessary in the future to prevent endocarditis