Disorders of the Heart

Valvular, peripheral vascular inflammatory and heart muscle diseases

Valvular heart disease

- Etiology/pathophysiology
  - Heart valves are compromised and do not open and close properly
    - Stenosis: thickening of the valve tissue, causing the valve to become narrow
    - Insufficiency: valve is unable to close Insufficiency: completely.
Valvular heart disease

- Causes may be:
  - Congenital
  - Rheumatic fever

Valvular heart disease

- Clinical manifestations/assessment
  - Murmur
  - Fatigue
  - Angina
  - Oliguria
  - Pale, cool skin
  - Weight gain
  - Restlessness
  - Abnormal breath sounds
  - Edema

Valvular heart disease

- Medical management
  - Restrict activities
  - Sodium-restricted diet
  - Diuretics
  - Digoxin
  - Antidysrhythmics
  - Surgery
    - Open mitral commissurotomy
    - Valve replacement
Valvular heart disease

Open mitral commissurotomy

Nursing interventions

- Assisting with ability to perform ADLs
- Relieving specific symptoms associated with decreased cardiac output
- Promoting comfort.
- Provide a sodium-restricted diet.
- Balance activities with rest periods.
- Use oxygen as prescribed by physician
- Monitor I&O.
- Weigh patient daily.

Disorders of the Peripheral Vascular System
Disorders of the Peripheral Vascular System

• Arteriosclerosis
  – Thickening, loss of elasticity, and calcification of arterial walls, resulting in decreased blood supply

• Atherosclerosis
  – Narrowing of the artery due to yellowish plaques of cholesterol, lipids, and cellular debris in the inner layers of the walls of large- and medium-sized arteries
  – A type of arteriosclerosis

Blood Pressure

• Normal blood pressure is systolic blood pressure of less than 120 mm Hg and diastolic blood pressure less than 80 mm Hg

• People with a blood pressure of 120 to 139 mm Hg systolic or 80 to 89 mm Hg diastolic as being pre-hypertensive.

• Hypertension is a sustained elevated systolic blood pressure greater than 140 mm Hg and/or a sustained elevated diastolic blood pressure greater than 90 mm Hg.
Blood Pressure

- Blood flow and peripheral vascular resistance play an important role in regulating blood pressure.
- Vasoconstriction and vasodilation are controlled by the sympathetic nervous system and the renin-angiotensin system of the kidney.

Hypertension

- Etiology/pathophysiology
  - A diagnosis is not based on a one-time elevated blood pressure reading, but after averaging two or more elevated blood pressure readings taken on separate occasions.
  - Vasoconstriction (increases blood pressure)
  - Essential (primary) hypertension
    - 90-95% of all diagnosed cases
  - Secondary hypertension
    - Attributed to an identifiable medical diagnosis

Hypertension

Non-modifiable Risk Factors

- **Age**: Risk increases as age advances past 30 years old
- **Gender**: Men are more at risk than women
- **Race**: Risk twice as high in African-Americans as in whites
- **Family history**: Risk increases with a family history of hypertension
Hypertension
Modifiable Risk Factors

• Smoking: Nicotine constricts blood vessels
• Obesity: Associated with increased blood volume
• High-sodium diet: Increases water retention, which increases blood volume
• Elevated serum cholesterol: Leads to atherosclerosis and narrowing of blood vessels
  • Oral contraceptives/estrogen therapy: May contribute to elevated blood pressure
• Alcohol: Increases plasma catecholamines (biologically active amines, epinephrine, and norepinephrine), which leads to blood vessel constriction
• Emotional stress: Stimulates the sympathetic nervous system, which leads to blood vessel constriction
• Sedentary lifestyle: Regular exercise contributes to lower

Hypertension

– Clinical manifestations
  • Headache; blurred vision
  • Epistaxis
  • Angina
Malignant Hypertension

- Malignant hypertension is a severe, rapidly progressive elevation in blood pressure (diastolic pressure greater than 120 mm Hg) that causes damage to the small arterioles in major organs (heart, kidneys, brain, eyes)

Medical management

- Lose excess weight
- Reduce saturated fat
- Limit alcohol intake
- Exercise regularly
- Reduce sodium intake
- Consume enough potassium, calcium, and magnesium
- Stop smoking.
- Relaxation techniques/stress management

For uncomplicated hypertension, drug treatments include:

- Diuretics (thiazides, loop diuretics, potassium sparing)
- Beta-adrenergic blockers such as metoprolol (Lopressor), nadolol (Corgard), propranolol (Inderal)
- Angiotensin-converting enzyme (ACE) inhibitors such as captopril (Captopen), enalapril (Vasotec), lisinopril (Prinivil, Zestril)
• Angiotensin II receptor blockers such as valsartan (Diovan), losartan (Cozaar), irbesartan (Avapro)
• Calcium channel blockers such as diltiazem (Cardizem), amlodipine (Norvasc), nifedipine (Procardia)
• Alpha-agonists such as clonidine

Medical management

Special considerations are as follows:
• Diabetes mellitus: ACE inhibitors
• Heart failure: ACE inhibitors, diuretics
• Myocardial infarction: beta blockers, ACE inhibitors
• African-Americans: calcium channel blockers, diuretics
• Isolated systolic hypertension in older patients: diuretics preferred, long-acting calcium channel blockers

Nursing Interventions

• Assess level of understanding.
• Implement teaching plan for hypertension
  – Dietary restrictions
  – Exercise program
  – Relaxation techniques
  – Sexual dysfunction as a potential side effect of adrenergic inhibitors
  – Compliance with therapy and follow-up appointments
Arterial aneurysm

– Etiology/pathophysiology
  • Enlarged, dilated portion of an artery
  • Causes: arteriosclerosis; trauma; congenital

– Clinical manifestations/assessment
  • Asymptomatic
  • Large pulsating mass
  • Pain, if large enough to press on other structures
Arterial aneurysm

– Medical management/nursing interventions
  • Assess for signs and symptoms of rupture, thrombi, ischemia
  • Control hypertension
  • Surgery
    – Ligation
    – Grafts

Heart Muscle Diseases

Classification

• Primary—unknown cause
  – Dilated: ventricular dilation (most Common)
  – Hypertrophic: increased size and mass of the heart because increased muscle thickness.
  – Restrictive: ventricular walls are rigid

• Secondary—Infective, metabolic, nutritional, alcohol, periartum, drugs, radiation, SLE, rheumatoid arthritis. Crack heart
Clinical manifestations/assessment

- Syncope
- Dyspnea on exertion
- Fatigue
- Severe exercise intolerance
- Angina
- Signs and symptoms of left- and right-sided CHF

Diagnosis

- Clinical manifestations
- EKG
- CXR
- Echocardiogram
- CT Scan
- CC
- Endomyocardial biopsy
Medical management

- Treat underlying cause
- Diuretics
- ACE inhibitors
- Beta-adrenergic blocking agents
- Internal defibrillator
- Cardiac transplant

Nursing interventions

- Educate the patient about avoiding strenuous exercise because to the risk of sudden death.
- Avoid dehydration.
- Educate patient to space activities and allow for rest periods

Nursing interventions

- Monitor the response of medications
- Monitor dysthrythmias.
- Provide emotional and psychological support.
Inflammatory Cardiac Disease

Rheumatic heart disease

- Etiology/pathophysiology
  - Rheumatic fever
    - Inflammatory disease which is a delayed childhood reaction to inadequately treated childhood upper respiratory tract infection of beta-hemolytic streptococci
    - Causes scar tissue in the heart

Rheumatic heart disease

- Clinical manifestations/assessment
  - Elevated temperature
  - Elevated heart rate
  - Epistaxis
  - Anemia
  - Joint pain and stiffness
  - Nodules on the joints
  - Specific to valve affected
  - Heart murmur
Rheumatic heart disease

- Medical management/nursing interventions
  - Prevention
    - Treat infections rapidly and completely
  - Bedrest
  - NSAIDs
  - Application of heat
  - Well-balanced diet (supplement with vitamins B and C)
  - Encourage fluids
  - Commissurotomy or valve replacement

Pericarditis

- Etiology/pathophysiology
  - Inflammation of the membranous sac surrounding the heart
  - May be acute or chronic
  - Bacterial, viral, or fungal
  - Noninfectious conditions
    - Azotemia, MI, neoplasms, scleroderma, trauma, systemic lupus erythematosus (SLE), radiation, drugs

Pericarditis

- Clinical manifestations/assessment
  - Debilitating pain
  - Dyspnea
  - Fever
  - Chills
  - Diaphoresis
  - Leukocytosis
  - Pericardial friction rub
  - Pericardial effusion
Pericarditis

- Medical management/nursing interventions
  - Analgesia
  - Oxygen
  - IV fluids
  - Salicylates
  - Antibiotics
  - Antiinflammatory agents
  - Corticosteroids
  - Surgery: pericardial window, pericardial tap

Endocarditis

- Etiology/pathophysiology
  - Infection or inflammation of the inner membranous lining of the heart

- Clinical manifestations/assessment
  - Influenza-like symptoms
  - Petechiae on the conjunctiva, mouth, and legs
  - Anemia
  - Splinter hemorrhages under nails
  - Weight loss
  - Heart murmur

Endocarditis

- Medical management/nursing interventions
  - Bedrest
  - Antibiotics
    - IV for 1-2 months
  - Prophylactic antibiotics for "high-risk" patients
  - Surgical repair of diseased valves or valve replacement
Myocarditis

– Etiology/pathophysiology
  • Inflammation of the myocardium
  • Rheumatic heart disease
  • Viral, bacterial, or fungal infection
  • Endocarditis
  • Pericarditis

Myocarditis

– Medical management/nursing interventions
  • Bedrest
  • Oxygen
  • Antibiotics; antiinflammatory agents
  • Assessment and correction of dysrhythmias

– Clinical manifestations/assessment
  • Vary according to site of infection
  • Cardiac enlargement
  • Murmur; gallop; tachycardia