Chapter 22

Drugs for Lipid Disorders

Lipids and Cardiovascular Disease

- Nutritional research: link between lipid levels and cardiovascular disease
- Advances helped identify clients at risk for cardiovascular disease

Lipids and Cardiovascular Disease (continued)

- Research in pharmacology
  - Has led to safe, effective drugs for lowering lipid levels
  - Has decreased risk of cardiovascular-related diseases
- Incidence of death from most cardiovascular diseases declining

Three Types of Lipids

- Triglycerides
- Phospholipids
- Steroids

Triglycerides

- Neutral fat
- Three fatty acids attached to glycerol
- Energy source
- Account for 90% of total lipids in body
Phospholipids

- Replace one of fatty acids in a triglyceride
- Essential to building plasma membranes
- Best-known phospholipids are lecithins

Steroids

- Common chemical structure is steroid nucleus or ring
- **Cholesterol** is most widely known of the steroids
  - Natural and vital component of plasma membranes

Steroids (continued)

- Necessary for production of
  - Vitamin D, bile acids
  - Cortisol, estrogen, testosterone
- Body makes enough cholesterol
- Not necessary in the diet

Lipoproteins

- Carriers of lipid molecules
- Consist of cholesterol, triglycerides, and phospholipids with protein carrier
- Protein carrier is known as apoprotein
- Three types: high-density lipoprotein (HDL), low-density lipoprotein (LDL), very low-density lipoprotein (VLDL)

LDL

- LDL transports cholesterol from liver to tissues and organs
- Carries highest amount of cholesterol
- Known as **bad cholesterol**

VLDL

- Primary carrier of triglycerides in blood
**HDL**

- Manufactured in liver and small intestine
- Assists in transport of cholesterol away from body tissues and back to liver
- Transports cholesterol for destruction
- Known as **good cholesterol**

**Lifestyle Changes**

- Monitor blood-lipid levels
- Maintain weight; exercise
- Reduce dietary saturated fats and cholesterol
- Increase soluble fiber in diet
- Reduce or eliminate tobacco use

**HMG-CoA Reductase Inhibitors/Statins**

- **Prototype drug**: atorvastatin (Lipitor)
- **Mechanism of action**: inhibits HMG-CoA reductase
- **Primary use**: Reduces serum-lipid levels
- **Adverse effects**: headache, fatigue, muscle or joint pain, and heartburn

**Atorvastatin Animation**

Click here to view an animation on the topic of atorvastatin.

**Bile-Acid Resins**

- **Prototype drug**: cholestyramine (Questran)
- **Mechanism of action**: bind with bile acids
- **Primary use**: to lower serum-lipid levels
- **Adverse effects**: GI tract, such as bloating and constipation
- Can bind other drugs, increasing potential for drug interactions

**Nicotinic Acid**

- **Prototype drug**: niacin
- **Mechanism of action**: to decrease VLDL levels
- **Primary use**: to reduce triglycerides; increase HDL levels
- **Adverse effects**: flushing, hot flashes, nausea, excess gas, diarrhea
Fibric-Acid Agents

- **Prototype drug**: gemfibrozil (Lopid)
- **Mechanism of action**: unknown
- **Primary use**: treating severe hypertriglyceridemia
- **Adverse effects**: GI distress, watch for bleeding with clients on anticoagulants

Cholesterol Absorption Inhibitor

- **Prototype drug**: ezetimibe (Vytorin)
- **Mechanism of action**: inhibits absorption of cholesterol
- **Primary use**: modest reduction in LDL
- **Adverse effects**: none

Statins

- Interfere with the synthesis of cholesterol
- First drugs of choice to reduce blood-lipid levels
- **Examples**: Lescol, Mevacor, Crestor, Zocar

Bile Acid–Binding Resins

- Bind with bile acids to increase excretion of cholesterol in stool
- Used in combination with statins
- **Examples**: Welchol, Colestid, Tricor

Nicotinic Acid (Niacin)

- B-complex vitamin
- Decreases VLDL and LDL levels

Fibric-Acid Agents

- Drugs of choice for treating severe hypertriglyceridemia
- **Examples**: Atromid-S, Tricor
Cholesterol-Absorption Inhibitor

- New class of drug
- Inhibits the absorption of cholesterol

Role of Nurse

- Monitor client’s condition
- Provide education on prescribed medications
- Assess client’s triglyceride, total cholesterol, LDL, and HDL levels

Statins

- Monitor liver-function tests
- Do not use with pregnancy or breast-feeding
- Watch for signs of GI upset

Bile-Acid Resins

- Monitor for significant GI effects
- Obtain careful history for past GI disorders

Nicotinic Acid (Niacin)

- Monitor client’s liver function
- Monitor uric-acid levels, if predisposed to gout
- Monitor blood-sugar levels, if diabetic

Fibric-Acid Agents

- Assess for complaints of GI distress before starting drug.
- Use with warfarin may potentiate anticoagulant effects
  - Monitor prothrombin time/international normalized ration (PT/INR)
Drugs for Lipid Disorders

• Assessment
  – Obtain blood samples
  – Assess laboratory tests: triglyceride, total cholesterol, LDL, HDL levels
  – Collect client’s height and weight
  – Obtain nursing history: lifestyle, current drugs, dietary habits
  – Assess client’s and family’s knowledge

• Nursing diagnoses
  – Knowledge deficit regarding condition
  – Ineffective regimen management
  – Risk for bleeding

• Planning
  – Goals for client
    • To reduce serum-lipid levels
    • Ability to explain hyperlipidemia
    • Ability to verbalize how to follow therapy

• Implementation
  – Encourage compliance with medication regimen
  – Provide education regimen

• Evaluation
  – Ideal outcome criteria
    • Lowered serum-lipid levels
    • No organ damage, no injury
    • Client verbalizes importance of prescribed medications

Table 22.2 Drugs for Dyslipidemias
### Table 22.2b Drugs for Dyslipidemias