Chapter 40

Drugs for Peptic Ulcer Disease

Digestive System

- Responsible for breaking down food, absorbing nutrients, eliminating wastes
- Alimentary canal
  - Also known as gastrointestinal tract
  - Reaches from mouth to anus

Digestive System (continued)

- Mucosa layer lines alimentary canal
  - Provides surface for breakdown and absorption of food.
  - Peristalsis—rhythmic contractions of smooth muscle in GI tract
- Accessory organs
  - Salivary glands, liver, gallbladder, pancreas

Stomach

- Two muscular rings
  - Cardiac sphincter—keeps food from moving back up esophagus
  - Pyloric sphincter—regulates the flow of food out of the stomach into the small intestine
- Stomach’s chief cells secrete enzymes; parietal cells secrete hydrochloric acid
  - Accelerate process of chemical digestion
- Thick mucous layer and bicarbonate ion protect stomach mucosa from acid
Peptic Ulcer Disease

- Lesion in stomach called gastric ulcer
- Lesion in small intestine called duodenal ulcer
- Associated with several risk factors
  - Family history, type O blood
  - Tobacco use and caffeine
  - Glucocorticoids and NSAIDs
  - Psychological stress

Peptic Ulcer Disease (continued)

- *Helicobacter pylori*
  - Primary cause of peptic ulcers
  - Gram-negative bacterium
- Other causes (contributors to ulcers and inflammation)
  - Secretion of excess gastric acid
  - Hyposecretion of adequate mucus
  - NSAIDs (most common cause in those that are not infected with *H. pylori*)

Gastroesophageal Reflux Disease

- Caused by loosening of sphincter between esophagus and stomach
- Acidic stomach contents move up into esophagus
  - Causes intense burning (heartburn)
  - May lead to esophageal ulcers, esophagitis, or strictures

Duodenal Ulcer

- More common than gastric ulcer
- Occurs most commonly in 30–50 age group
- Usual symptom: gnawing or burning upper-abdominal pain
  - Occurs 1–3 hours after a meal
  - Pain worse when stomach is empty

Duodenal Ulcer (continued)

- Other symptoms: nocturnal pain, nausea, vomiting
- Bleeding may occur
  - Bright red blood in vomit
  - Black, tarry stools
Gastric Ulcers

- Less common type of ulcer
- More common in over-60 age group
- Symptoms
  - Pain may be relieved after food or may continue after a meal.
  - Anorexia, weight loss, vomiting
- Remissions infrequent or absent
- More commonly associated with cancer

Treatment of Gastroesophageal Reflux Disease

- Treatment of GERD and peptic ulcer disease is similar
- Primary goal is to reduce gastric-acid secretion
- Drug classes
  - H2-receptor blockers
  - Antacids
  - Proton pump inhibitors
- Surgery may be necessary

Treatment of Peptic Ulcer Disease

- Combination of lifestyle changes and pharmacotherapy best
- Treatment goals
  - Eliminate infection by *H. pylori*
  - Promote ulcer healing
  - Prevent recurrence of symptoms

Treatment of Peptic Ulcer Disease (continued)

- Drugs used in treatment
  - H2-receptor antagonists
  - Proton pump inhibitors
  - Antacids
  - Antibiotics and miscellaneous drugs

Treatment of *H. pylori*

- Goals of treatment
  - Primary: bacteria completely eradicated
  - Ulcers heal more rapidly
  - Ulcers remain in remission longer
- Very high reoccurrence when *H. pylori* not eradicated
- Infection can remain active for life if not treated.

Role of the Nurse

- Monitor client’s condition
- Provide client education
- Obtain medical, surgical, and drug history
- Assess lifestyle and dietary habits
- Obtain description of symptomology and current therapies
**H2-Receptor Antagonist Therapy**

- Assess client's use of OTC formulations
- If using OTC formulations, client should seek medical attention if symptoms persist or reoccur
- Persistent epigastric pain or heartburn may be symptom of more serious disease

**H2-Receptor Antagonist Therapy (continued)**

- Dysrhythmias and hypotension have occurred with IV cimetidine
  - Ranitidine (Zantac) or famotidine (Pepcid) can be administered intravenously
- Assess kidney and liver function
- Evaluate client's CBC for possible anemia during long-term use

**Proton Pump Inhibitor Therapy for PUD**

- Well tolerated for short-term use
- Monitor liver function and serum gastrin with long-term use
- Assess for drug-drug interactions
- Obtain client's history of smoking

**Proton Pump Inhibitor Therapy for PUD (continued)**

- Take 30 minutes prior to eating, usually before breakfast
- May be administered at same time as antacids
- Often administered in combination with clarithromycin (Biaxin)

**Antacid Therapy for PUD**

- Obtain medical history, including use of OTC and prescription drugs
- Assess client for signs of renal insufficiency
  - Hypermagnesemia may occur—kidneys unable to excrete excess magnesium
- Magnesium- and aluminum-based products may cause diarrhea
- Calcium-based products may cause constipation

**H2-Receptor Blockers**

- **Prototype drug**: ranitidine (Zantac)
- **Mechanism of action**: acts by blocking H2-receptors in stomach to decrease acid production
- **Primary use**: to treat peptic ulcer disease
- **Adverse effects**: possible reduction in number of red and white blood cells and platelets, impotence or loss of libido in men
**Proton Pump Inhibitors**

- **Prototype drug:** omeprazole (Prilosec)
- **Mechanism of action:** reduces acid secretion in stomach by binding irreversibly to enzyme H+, K+-ATPase
- **Primary use:** for short-term, 4- to 8-week therapy for peptic ulcers and GERD
- **Adverse effects:** headache, nausea, diarrhea, rash, abdominal pain
  - Long-term use associated with increased risk of gastric cancer

**Antacids**

- **Prototype drug:** aluminum hydroxide (Amphojel)
- **Mechanism of action:** neutralizes stomach acid by raising pH of stomach contents
- **Primary use:** in combination with other antiulcer agents for relief of heartburn due to PUD or GERD
- **Adverse effects:** minor; constipation

**Antibiotics**

- Administered to treat *H. pylori* infections of gastrointestinal tract
- Two or more antibiotics given concurrently
  - Increase effectiveness
  - Lower potential for resistance

- The regimen often includes
  - Proton pump inhibitor
  - Bismuth compounds
    - Inhibit bacterial growth
    - Prevent *H. pylori* from adhering to gastric mucosa
Miscellaneous Drugs to Treat PUD

- Sucralfate
  - Coats ulcer and protects it from further erosion
- Misoprostol
  - Inhibits acid and stimulates production of mucus
- Pirenzepine
  - Inhibits autonomic receptors responsible for gastric-acid secretion

H2-Receptor Blockers

- Slow acid secretion by stomach
- Often drugs of choice in treating PUD and GERD
- Cimetidine used less frequently
  - Drug-drug interactions are numerous.
- Do not take antacids at same time as H2-receptor blockers.
  - Decreases absorption

Proton Pump Inhibitors

- Block enzyme H+, K+, ATPase
  - This enzyme increases hydrochloric acid
- Used for short-term therapy for PUD and GERD
- More effective at reducing gastric-acid secretion
- Have longer duration than H2-receptor blockers

Antacids

- Inexpensive and effective at neutralizing stomach acid
- Simethicone added to reduce gas
- Relieve symptoms but do not promote ulcer healing

Antacids (continued)

- Aluminum compounds may cause constipation
- Magnesium compounds can cause diarrhea

Antibiotics

- Administered to treat H. pylori infections of gastrointestinal tract
- Two or more antibiotics given concurrently
  - Increase effectiveness
  - Lower potential for resistance
- Regimen often includes
  - Proton pump inhibitor
  - Bismuth compounds
  - Inhibit bacterial growth
  - Prevent H. pylori from adhering to gastric mucosa
Miscellaneous Drugs

• Several additional drugs are beneficial in treating PUD
  – Sucralfate
    • Coats ulcer and protects it from further erosion
  – Misoprostol
    • Inhibits acid and stimulates production of mucus
  – Pirenzepine
    • Inhibits autonomic receptors responsible for gastric-acid secretion

Patients Receiving Pharmacotherapy for PUD or GERD

• Assessment
  – Obtain complete health history
  – Assess client for signs of GI bleeding
  – Obtain vital signs. Assess level of consciousness
  – Obtain results of CBC, liver-, renal-function tests

• Nursing Diagnoses
  – Risk for falls, related to adverse effect of drug
  – Deficient knowledge, related to drug therapy
  – Acute pain, related to gastric irritation from ineffective drug therapy
  – Altered nutrition, less than body requirements, related to adverse effects of drug

• Planning—client will
  – Report episodes of drowsiness, dizziness
  – Demonstrate understanding of drug therapy
  – Report reoccurrence of abdominal pain or discomfort during drug therapy
  – Report decrease in symptoms

• Implementation
  – Monitor use of OTC drugs to avoid drug interactions
  – Monitor level of abdominal pain or discomfort
  – Institute effective safety measures regarding falls
  – Explain need for lifestyle changes
  – Observe client for signs of GI bleeding

• Evaluation
  – Client verbalizes signs and symptoms to report to health-care provider
  – Client accurately verbalizes understanding of drug therapy
  – Client reports decrease in abdominal pain during drug therapy
### H₂-receptor Antagonists

**Table 40.1 H₂-receptor Antagonists**

### Proton Pump Inhibitors

**Table 40.2 Proton Pump Inhibitors**

### Antacids

**Table 40.3 Antacids**