Chapter 42

Drugs for Nutritional Disorders

Vitamins

- Organic substances are needed in small amounts
  - Promote growth
  - Maintain health

Vitamins (continued)

- Human cells cannot produce vitamins
  - Exception: vitamin D
  - Vitamins or provitamins must be supplied in diet
  - Deficiency will result in disease

Vitamins Serve Important Roles in Function of Body

- Vitamin B complex: coenzymes essential to metabolic processes
- Vitamin A: precursor of retinol needed for normal vision
- Vitamin D: regulates calcium metabolism
- Vitamin K: needed to produce prothrombin

Lipid-Soluble Vitamins (A, D, E, K)

- Must be ingested with lipids to be absorbed in small intestine
- Excess stored in liver and adipose tissue
  - Can be removed from storage areas and used as needed
- Excessive intake can lead to dangerously high levels

Water-Soluble Vitamins (C, B Complex)

- Absorbed with water in digestive tract
- Easily dissolved in blood and body fluids
Water-Soluble Vitamins (C, B Complex) (continued)

- Excess cannot be stored
  - Excreted in urine
  - Must be ingested daily

Recommended Dietary Allowances (RDAs)

- Minimum amount of a vitamin needed to prevent symptoms of deficiency
- Need for vitamins and minerals varies among individuals
- Supplements should never substitute for healthy diet

Vitamin Pharmacotherapy

- Indicated for certain conditions
  - Poor nutritional intake
  - Pregnancy
  - Chronic-disease states

Symptoms of Deficiency

- Usually nonspecific; occur over prolonged period
- Often result of certain factors
  - Poverty, fad diets
  - Chronic alcohol or drug abuse
  - Prolonged parenteral feeding
- Clients often present with multiple deficiencies

Deficiencies in Lipid-Soluble Vitamins

- Vitamin A (retinol)
  - Obtained from foods containing carotenes
- Vitamin D
  - D2 (ergocalciferol)—from dairy products
  - D3—from ultraviolet light

Deficiencies in Lipid-Soluble Vitamins (continued)

- Vitamin E (tocopherols)
  - Found in plant-seed oils, whole-grain cereals, eggs, certain organ meats
  - Primary antioxidant
- Vitamin K—mixture of several chemicals
  - K1 obtained from plant sources
  - K2 obtained from microbial flora in colon
  - Needed for clotting
Deficiencies in Water-Soluble Vitamins

- Vitamin C deficiency can cause scurvy
- Thiamine (B1) deficiency can cause beriberi
- Niacin (B3) deficiency can cause pellagra

Deficiencies in Water-Soluble Vitamins (continued)

- Cyanocobalamin (B12) deficiency can cause pernicious or megaloblastic anemia
- Deficiencies of riboflavin (B2), folic acid (B9), pyridoxine (B6)
  - Indicate need for pharmacotherapy with water-soluble vitamins

Minerals

- Inorganic substances
- Very small amounts needed to maintain normal metabolism
- Constitute 4% of body weight
- Can be obtained from normal diet
- Excess minerals can be toxic

Role of the Nurse

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

Drug Therapy with Fat-Soluble Vitamins

- Teach client that excessive vitamin intake can be harmful
- Assess for deficiency
- Assess for impaired liver function

Drug Therapy with Fat-Soluble Vitamins (continued)

- Assess for chronic overdose of vitamins
- Consider socioeconomic status and culture of client
  - Recommend foods that treat deficiency
  - Recommend foods that are affordable for and liked by client
Water-Soluble Vitamin Therapy

- Thiamine administered for hospitalized clients with severe liver disease
- Niacin and pyridoxine may cause severe flushing
  - Expected reaction for client; no permanent harm
- Assess women of childbearing age for folic acid deficiency
  - Prior to attempting or during pregnancy

(continued)

- Recommend multivitamin to avoid overdose
- Caution clients with history of kidney stones against using vitamin C
- Advise clients taking vitamin C to increase fluid intake
- Water-soluble vitamins are not stored in the body
  - Must be replenished daily

Macromineral Therapy

- For mineral deficiencies or eclampsia
- Large doses can cause life-threatening adverse effects
- Encourage well-balanced diet
  - Eliminates or reduces need for supplements

(continued)

- If calcium prescribed
  - Inform health-care provider of use of glucocorticoids, thiazide diuretics, tetracyclines
  - Avoid zinc-rich foods, which impair calcium absorption

- If phosphorus prescribed
  - Inform health-care provider if on sodium- or potassium-restricted diet
  - Immediately report seizure activity; stop drug
  - Avoid antacids
- If client is taking magnesium sulfate, immediately report
  - Changes in consciousness, deep tendon reflexes
  - Thirst, confusion

(continued)

- Seven major (macro) minerals
  - Calcium, chlorine, magnesium, phosphorous
  - Potassium, sodium, sulfur
- Must be obtained daily from dietary sources in amounts of 100 mg or greater
- Nine trace (micro) minerals
  - Include iron, iodine, fluorine, and zinc
- Required daily amount is 20 mg or less
Undernutrition

• Many causes
  – Low dietary intake
  – Malabsorption disorders
  – Fad diets
  – Wasting disorders such as cancer or AIDS

Undernutrition (continued)

• Reasons for low dietary intake vary
  – Poverty, depression, difficulty eating
  – Nutritional consultation is appropriate

Enteral Nutrition

• Provided orally or through feeding tube
• Means of meeting client’s nutritional needs

Classification of Enteral Products

• Oligomeric (Vivonex, T.E.N., Peptamen)
• Polymeric—most common type (Compeat, Sustacal, Ensure)
• Modular—given to supplement single nutrient (Casec, Polycose, Microlipid, MCT Oil)
• Specialized—given for special disease states (Amin-Aid, Hepatic-Aid II, Pulmocare)

Total Parenteral Nutrition (TPN)

• Also known as hyperalimentation
• Means of supplying nutrition to clients
  – Peripheral vein (short term)
  – Central vein (long term)
• Administered through infusion pump for precise monitoring

Clients Receiving Folic Acid

• Assessment
  – Obtain complete health history and complete physical examination
    • Special attention to symptoms related to anemic states
  – Obtain folic acid levels, hemoglobin (Hb), hematocrit (Hct), and reticulocyte counts
  – Obtain CBC to determine type of anemia
Clients Receiving Folic Acid

**Nursing diagnoses**
- Imbalanced nutrition: less than body requirements
- Deficient knowledge, related to drug therapy
- Noncompliance, related to dietary and drug treatment
- Impaired health maintenance, related to insufficient knowledge of actions and effects of prescribed drug therapy

**Planning**—client will
- Exhibit improvement in serum folic acid level
- Experience less fatigue and weakness
- Demonstrate understanding of drug’s action
- Verbalize potential complications related to drug use
- Verbalize when to notify health-care provider
- Report side effects, such as continued weakness and fatigue

**Implementation**
- Monitor client’s dietary intake of folic acid-containing foods
- Encourage client to conserve energy
- Encourage client to take medication appropriately

**Evaluation**
- Client’s serum folic acid level improves
- Client reports less fatigue and weakness
- Client demonstrates understanding of drug’s action

**Evaluation (continued)**
- Client verbalizes potential complications related to drug use
- Client verbalizes when to notify health-care provider
- Client reports side effects such as continued weakness and fatigue

Clients Receiving Parenteral Nutrition

**Assessment**
- Obtain complete health history and complete physical examination
- Assess for presence or history of nutritional deficits
- Obtain lab studies
  - Total protein/albumin levels, creatinine/blood urea nitrogen (BUN)
  - CBC electrolytes, lipid profile, serum iron levels
Clients Receiving Parenteral Nutrition

- Nursing diagnoses
  - Risk for infection
  - Imbalanced nutrition: less than body requirements
  - Risk for imbalanced fluid volume
  - Deficient knowledge, related to drug therapy
  - Risk for injury

Clients Receiving Parenteral Nutrition (continued)

- Planning (continued)—client will
  - Immediately report side effects
    - Symptoms of hypoglycemia or hyperglycemia
    - Fever, chills, cough, malaise

Clients Receiving Parenteral Nutrition

- Planning—client will
  - Exhibit improvement in or stabilization of nutritional status
  - Be free of infection or injury related to TPN
  - Demonstrate understanding of drug’s action

Clients Receiving Parenteral Nutrition (continued)

- Implementation
  - Monitor vital signs
    - Observe for signs of infection, such as elevated temperature
  - Take extraordinary precautions to prevent infection
  - Monitor blood-glucose levels

Clients Receiving Parenteral Nutrition

- Evaluation
  - Client demonstrates improved nutritional status
  - Client is free of infection or injury related to TPN
  - Client demonstrates understanding of drug’s action
Clients Receiving Parenteral Nutrition (continued)

- Evaluation (continued)
  - Client verbalizes importance of immediately reporting any side effects
  - Symptoms of hypoglycemia or hyperglycemia
  - Fever, chills, cough, malaise

Lipid-soluble Vitamins

Table 42.2 Lipid-soluble Vitamins

Water-soluble Vitamins

Table 42.3 Water-soluble Vitamins

Selected Minerals

Table 42.4 Selected Minerals

Selected Minerals

Table 42.4b Selected Minerals

Selected Minerals

Table 42.4c Selected Minerals