• Overview of Anatomy and Physiology

• Endocrine glands and hormones
  • The endocrine system is composed of a series of ductless glands
  • It communicates through the use of hormones
    • Hormones are chemical messengers that travel through the bloodstream to their target organ

• Overview of Anatomy and Physiology

• Pituitary gland—“master gland”
  • Anterior pituitary gland
  • Posterior pituitary gland

• Thyroid gland

• Parathyroid gland

• Adrenal gland
  • Adrenal cortex
  • Adrenal medulla

• Pancreas

• Figure 51-2

• Overview of Anatomy and Physiology

• Female sex glands
  • Ovaries
  • Placenta

• Male sex glands
  • Testes
Thymus gland

Pineal gland

Figure 51-1

Disorders of the Pituitary Gland

Acromegaly

- Etiology/pathophysiology
  - Overproduction of growth hormone in the adult
  - Idiopathic hyperplasia of the anterior pituitary gland
  - Tumor growth in the anterior pituitary gland
  - Changes are irreversible

Disorders of the Pituitary Gland

Acromegaly (continued)

- Clinical manifestations/assessment
  - Enlargement of the cranium and lower jaw
  - Separation and malocclusion of the teeth
  - Bulging forehead
  - Bulbous nose
  - Thick lips; enlarged tongue
  - Generalized coarsening of the facial features
  - Enlarged hands and feet
  - Enlarged heart, liver, and spleen

Disorders of the Pituitary Gland

Acromegaly (continued)

- Clinical manifestations/assessment (continued)
• Muscle weakness
• Hypertrophy of the joints with pain and stiffness
• Males—impotence
• Females—deepened voice, increased facial hair, amenorrhea
• Partial or complete blindness with pressure on the optic nerve due to tumor
• Severe headaches

Figure 51-6

Disorders of the Pituitary Gland

Acromegaly (continued)

- Medical management/nursing interventions
  - Pharmacological management
    - Parlodel
    - Sandostatin
    - Analgesics
  - Cryosurgery
  - Transsphenoidal removal of tissue
  - Proton beam therapy
  - Soft, easy-to-chew diet

Disorders of the Pituitary Gland

Gigantism

- Etiology/pathophysiology
  - Overproduction of growth hormone
  - Caused by hyperplasia of the anterior pituitary gland
  - Occurs in a child before closure of the epiphyses

Disorders of the Pituitary Gland

Gigantism (continued)
Clinical manifestations/assessment
• Great height
• Increased muscle and visceral development
• Increased weight
• Normal body proportions
• Weakness

Medical management/nursing interventions
• Surgical removal of tumor
• Irradiation of the anterior pituitary gland

Disorders of the Pituitary Gland

Dwarfism

Etiology/pathophysiology
• Deficiency in growth hormone; usually idiopathic
• Some cases attributed to autosomal recessive trait

Clinical manifestations/assessment
• Abnormally short height
• Normal body proportion
• Appear younger than age
• Dental problems due to underdeveloped jaws
• Delayed sexual development

Disorders of the Pituitary Gland

Dwarfism (continued)

Diagnostic tests

Medical management/nursing interventions
• Growth hormone injections
• Removal of tumor, if present
Disorders of the Pituitary Gland

Diabetes insipidus

- Etiology/pathophysiology
  - Transient or permanent metabolic disorder of the posterior pituitary
  - Deficiency of antidiuretic hormone (ADH)
  - Primary or secondary

Disorders of the Pituitary Gland

Diabetes insipidus

- Clinical manifestations/assessment
  - Polyuria; polydipsia
  - May become severely dehydrated
  - Lethargic
  - Dry skin; poor skin turgor
  - Constipation

- Medical management/nursing interventions
  - ADH preparations
  - Limit caffeine due to diuretic properties

Disorders of the Thyroid and Parathyroid Glands

Hyperthyroidism

- Etiology/pathophysiology
  - Also called Graves’ disease, exophthalmic goiter, and thyrotoxicosis
  - Overproduction of the thyroid hormones
  - Exaggeration of metabolic processes
  - Exact cause unknown

Hyperthyroidism (continued)
- **Clinical manifestations/assessment**
  - Edema of the anterior portion of the neck
  - Exophthalmos
  - Inability to concentrate; memory loss
  - Dysphagia
  - Hoarseness
  - Inability to concentrate; memory loss
  - Dysphagia
  - Hoarseness
  - Increased appetite
  - Weight loss
  - Nervousness

- **Hyperthyroidism (continued)**

- **Clinical manifestations/assessment (continued)**
  - Insomnia
  - Tachycardia; hypertension
  - Warm, flushed skin
  - Fine hair
  - Amenorrhea
  - Elevated temperature
  - Diaphoresis
  - Hand tremors

- **Hyperthyroidism (continued)**

- **Medical management/nursing interventions**
  - Pharmacological management
    - Propylthiouracil
    - Methimazole
  - Radioactive iodine
  - Subtotal thyroidectomy

- **Hyperthyroidism (continued)**
Medical management/nursing interventions (continued)

• Postoperative
  ▪ Voice rest; voice checks
  ▪ Avoid hyperextension of the neck
  ▪ Tracheotomy tray at bedside
  ▪ Assess for signs and symptoms of internal and external bleeding
  ▪ Assess for tetany
    o Chvostek’s and Trousseau’s signs
  ▪ Assess for thyroid crisis

• Hypothyroidism

  ▪ Etiology/pathophysiology
    • Insufficient secretion of thyroid hormones
    • Slowing of all metabolic processes
    • Failure of thyroid or insufficient secretion of thyroid-stimulating hormone from pituitary gland

• Hypothyroidism (continued)

  ▪ Clinical manifestations/assessment
    • Hypothermia; intolerance to cold
    • Weight gain
    • Depression
    • Impaired memory; slow thought process
    • Lethargic
    • Anorexia
    • Constipation

• Hypothyroidism (continued)

  ▪ Clinical manifestations/assessment
    • Decreased libido
    • Menstrual irregularities
    • Thin hair
• Skin thick and dry
• Enlarged facial appearance
• Low, hoarse voice
• Bradycardia
• Hypotension

Hypothyroidism (continued)

Medical management/nursing interventions

• Pharmacological management
  ▪ Synthroid
  ▪ Levothyroid
  ▪ Proloid
  ▪ Cytomel

• Symptomatic treatment

Simple goiter

Etiology/pathophysiology

• Enlarged thyroid due to low iodine levels
• Enlargement is caused by the accumulation of colloid in the thyroid follicles
• Usually caused by insufficient dietary intake of iodine

Simple goiter (continued)

Clinical manifestations/assessment

• Enlargement of the thyroid gland
• Dysphagia
• Hoarseness
• Dyspnea

Medical management/nursing interventions

• Pharmacological management
  ▪ Potassium iodide
• Diet high in iodine
• Surgery—thyroidectomy

Figure 51-10

Cancer of the thyroid

■ Etiology/pathophysiology
  • Malignancy of thyroid tissue; very rare

■ Clinical manifestations/assessment
  • Firm, fixed, small, rounded mass or nodule on thyroid

■ Medical management/nursing interventions
  • Total thyroidectomy
  • Thyroid hormone replacement
  • If metastasis is present: radical neck dissection; radiation, chemotherapy, and radioactive iodine

Hyperparathyroidism

■ Etiology/pathophysiology
  • Overactivity of the parathyroid, with increased production of parathyroid hormone
  • Hypertrophy of one or more of the parathyroid glands

Hyperparathyroidism (continued)

■ Clinical manifestations/assessment
  • Hypercalcemia
  • Skeletal pain; pain on weight-bearing
  • Pathological fractures
  • Kidney stones
  • Fatigue
  • Drowsiness
  • Nausea
  • Anorexia
Hyperparathyroidism (continued)
- Medical management/nursing interventions
  - Removal of tumor
  - Removal of one or more parathyroid glands

Hypoparathyroidism
- Etiology/pathophysiology
  - Decreased parathyroid hormone
  - Decreased serum calcium levels
  - Inadvertent removal or destruction of one or more parathyroid glands during thyroidectomy

Hypoparathyroidism (continued)
- Clinical manifestations/assessment
  - Neuromuscular hyperexcitability
  - Involuntary and uncontrollable muscle spasms
  - Tetany
  - Laryngeal spasms
  - Stridor
  - Cyanosis
  - Parkinson-like syndrome
  - Chvostek’s and Trousseau’s signs

Hypoparathyroidism (continued)
- Medical management/nursing interventions
  - Pharmacological management
    - Calcium gluconate or intravenous calcium chloride
  - Vitamin D

Disorders of the Adrenal Glands
Adrenal hyperfunction (Cushing’s syndrome)

**Etiology/pathophysiology**
- Plasma levels of adrenocortical hormones are increased
- Hyperplasia of adrenal tissue due to overstimulation by the pituitary gland
- Tumor of the adrenal cortex
- Adrenocorticotropic hormone (ACTH) secreting tumor outside the pituitary
- Overuse of corticosteroid drugs

Disorders of the Adrenal Glands

Adrenal hyperfunction (Cushing’s syndrome) *(continued)*

**Clinical manifestations/assessment**
- Moonface
- Buffalo hump
- Thin arms and legs
- Hypokalemia; proteinuria
- Increased urinary calcium excretion
- Susceptible to infections
- Depression
- Loss of libido

Disorders of the Adrenal Glands

Adrenal hyperfunction (Cushing’s syndrome) *(continued)*

**Clinical manifestations/assessment (continued)**
- Ecchymoses and petechiae
- Weight gain
- Abdominal enlargement
- Hirsutism in women
- Menstrual irregularities
• Deepening of the voice

Disorders of the Adrenal Glands

• Adrenal hyperfunction (Cushing’s syndrome) (continued)
  ■ Medical management/nursing interventions
  • Treat causative factor
    ▪ Adrenalectomy for adrenal tumor
    ▪ Radiation or surgical removal for pituitary tumors
  • Lysodren
  • Dietary recommendations:
    ▪ Low-sodium
    ▪ High-potassium

Disorders of the Adrenal Glands

• Adrenal hypofunction (Addison’s disease)
  ■ Etiology/pathophysiology
    • Adrenal glands do not secrete adequate amounts of glucocorticoids and mineralocorticoids
    • May result from
      ▪ Adrenalectomy
      ▪ Pituitary hypofunction
      ▪ Long-standing steroid therapy

Disorders of the Adrenal Glands

• Adrenal hypofunction (Addison’s disease) (continued)
  ■ Clinical manifestations/assessment
    • Related to imbalances of hormones, nutrients, and electrolytes
    • Nausea; anorexia
    • Postural hypotension
    • Headache
    • Disorientation
• Abdominal pain; lower back pain
• Anxiety

Disorders of the Adrenal Glands

Adrenal hypofunction (Addison’s disease) (continued)

■ Clinical manifestations/assessment
  • Darkly pigmented skin and mucous membranes
  • Weight loss
  • Vomiting
  • Diarrhea
  • Hypoglycemia
  • Hyponatremia
  • Hyperkalemia
  • Assess for adrenal crisis

Disorders of the Adrenal Glands

Adrenal hypofunction (Addison’s disease) (continued)

■ Treatment
  • Restore fluid and electrolyte balance
  • Replacement of adrenal hormones
  • Diet high in sodium and low in potassium
  • Adrenal crisis
    ■ IV corticosteroids in a solution of saline and glucose

Disorders of the Adrenal Glands

Pheochromocytoma

■ Etiology/pathophysiology
  • Chromaffin cell tumor; usually found in the adrenal medulla
  • Causes excessive secretion of epinephrine and norepinephrine
Clinical manifestations/assessment
  • Hypertension

Medical management/nursing interventions
  • Surgical removal of tumor

Disorders of the Pancreas

Diabetes mellitus

Etiology/pathophysiology
  • A systemic metabolic disorder that involves improper metabolism of carbohydrates, fats, and proteins
  • Insulin deficiency
  • Risk factors
    ▪ Heredity
    ▪ Environment and lifestyle
    ▪ Viruses
    ▪ Malignancy or surgery of pancreas

Disorders of the Pancreas

Diabetes mellitus (continued)

Types of diabetes mellitus
  • Type I—insulin dependent (IDDM)
  • Type II—non-insulin dependent (NIDDM)

Clinical manifestations/assessment
  • Type I and type II
    ▪ “3 Ps”
      o Polyuria
      o Polydipsia
      o Polyphagia

Disorders of the Pancreas

Diabetes mellitus (continued)
Clinical manifestations/assessment (continued)

• Type I
  ▪ Sudden onset
  ▪ Weight loss
  ▪ Hyperglycemia
  ▪ Under 40 years old

Disorders of the Pancreas

Diabetes mellitus (continued)

Clinical manifestations/assessment (continued)

• Type II
  ▪ Slow onset
  ▪ May go undetected for years
  ▪ “3 Ps” are usually mild
  ▪ If untreated, may have skin infections and arteriosclerotic conditions

Disorders of the Pancreas

Diabetes mellitus (continued)

Diagnostic tests

• Fasting blood glucose (FBG)
• Oral glucose tolerance test (OGTT)
• 2-hour postprandial blood sugar
• Patient self-monitoring of blood glucose (SMBG)
• Glycosylated hemoglobin (HbA1c)
• C-peptide test

Disorders of the Pancreas

Diabetes mellitus (continued)

Medical management/nursing interventions

• Diet
- A goal of nutritional therapy is to achieve a blood glucose level of <126 mg/dL
- Balanced diet should include proteins, carbohydrates, and fats
- Type II—may be controlled by diet alone
- Type I—diet is calculated and then the amount of insulin required to metabolize it is established

Disorders of the Pancreas

Diabetes mellitus (continued)

- Medical management/nursing interventions (continued)
  - Diet (continued)
    - American Diabetes Association (ADA) diet
      - Seven exchanges
      - Quantitative diet
    - Need three regular meals with snacks between meals and at bedtime to maintain constant glucose levels

Disorders of the Pancreas

Diabetes mellitus (continued)

- Medical management/nursing interventions (continued)
  - Exercise
    - Promotes movement of glucose into the cell
    - Lowers blood glucose
    - Lowers insulin needs
  - Stress of acute illness and surgery
    - Extra insulin may be required
    - Increased risk of ketoacidosis (hyperglycemia)
    - Glucose must be monitored closely

Disorders of the Pancreas

Diabetes mellitus (continued)

- Medical management/nursing interventions (continued)
  - Medications
    - Insulin
- Classified by action: Regular; Lente and NPH; Ultralente
- Classified by type: beef/pork: Humulin/Novolin
- Injection sites should be rotated to prevent scar tissue formation
- Sliding scale

Figure 51-16

Disorders of the Pancreas

Diabetes mellitus (*continued*)

- Medical management/nursing interventions (*continued*)
  - Medications
    - Oral hypoglycemic agents
      - Stimulate islet cells to secrete more insulin
      - Only for type II diabetes mellitus

Disorders of the Pancreas

Diabetes mellitus (*continued*)

- Medical management/nursing interventions (*continued*)
  - Patient teaching
    - Good skin care
    - Report any skin abnormalities to physician
    - Special foot care is crucial
      - Do not trim toenails—go to podiatrist
      - No hot water bottles or heating pads
    - Assess for symptoms of hypoglycemia

Disorders of the Pancreas

Diabetes mellitus (*continued*)

- Medical management/nursing interventions (*continued*)
  - Acute complications
    - Coma
      - Diabetic ketoacidosis
      - Hyperglycemic hyperosmolar nonketotic
      - Hypoglycemic reaction
    - Infection
Disorders of the Pancreas

Diabetes mellitus (continued)

- Medical management/nursing interventions (continued)
  - Long-term complications
    - Diabetic retinopathy
    - Cardiovascular problems
    - Renal failure

Nursing Process

Nursing diagnoses

- Knowledge, deficient
- Self-esteem, risk for situational low
- Sensory and perceptual alterations: visual
- Fluid volume, deficient, risk for
- Infection, risk for
- Sexual dysfunction
- Body image, disturbed
- Coping, ineffective
- Nutrition, imbalanced
- Activity intolerance