Chapter 38

Child With an Oncological or Hematological Condition

https://www.youtube.com/watch?v=CVMzygtggzI
https://www.youtube.com/watch?v=AAx553k7W5s

The Development of the Hematological System and Hematological Abnormalities

- Development of hematological system begins early in fetal development
  - Blood:
    - Plasma: 10% solutes and 90% water
  - Hematopoietic system: major organ for the formation of blood
    - Located in bone marrow and lymphatic system
  - Cellular elements:
    - Red blood cells: erythrocytes
    - White bloods cells: neutrophis, eosinophils, basophils, T-lymphocytes, and B-lymphocytic plasma cells
    - Thrombocytes
    - See Table 38-1 Interpreting a Complete Blood Cell Count with a Manual Differentiation pg.. 704

The Development of the Hematological System and Hematological Abnormalities

- Functions of blood:
  - Oxygenation
  - Cellular nutrition
  - Excrete wastes
  - Maintain acid-base balance
  - Regulate body temperature
  - Defend against foreign antigens
  - Transport hormones

The Development of the Hematological System and Hematological Abnormalities

- Components:
  - Red blood cells
    - Lives 120 days
    - Main purpose to carry oxygen to cells in the body
  - White blood cells
    - Main purpose to respond to infection
  - Thrombocytes
    - Primary function is to assist with clotting

Anemias

- Categories:
  - Impaired production
  - Nutritional deficiency
  - Metabolic condition
  - Increased destruction
  - Impaired or decreased erythropoietin
  - Excessive blood loss

Anemias

- Clinical Manifestations:
  - Fatigue, irritability, pallor, petechiae, dizziness, dyspnea, bleeding, hematuria, syncope, changes in LOC, temperature intolerance, blurry vision, vertigo, epistaxis
- Assessment:
  - Dietary history
  - General performance status
  - General appearance
  - Vital signs
  - Laboratory tests
    - CBC with diff, urinalysis, occult blood, ferritin, serum iron, lead levels

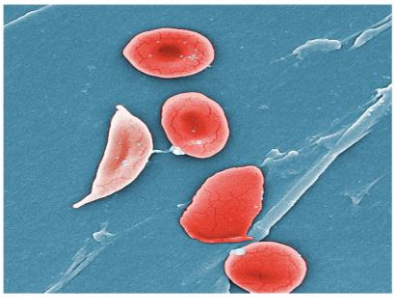
Anemias

- Interventions:
  - Quiet environment
  - Dietitian consult
  - Oxygen therapy
  - Medical treatment specific to the identified anemia
  - Transfusion therapy

Sickle cell anemia

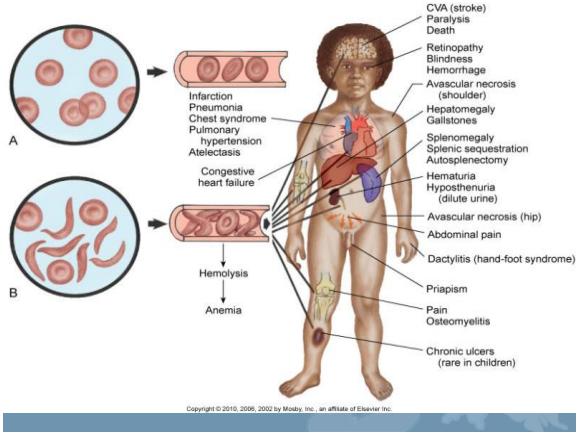
- Characterized by partial or complete replacement of abnormal hemoglobin S for normal hemoglobin A; the deformed cell changes from round to sickle shape (crescent)
- Risk factors: African or African American decent (autosomal-recessive genetic)
- Symptoms occur after 4-6 months of age
- Trigger: increased or decreased O2 demand
  - Emotional distress, infection, pain, pulmonary infections, dehydration

Sickled Cell



Sickle Cell Anemia

- Assessment:
  - Types of crises:
    - Vaso-occlusive
    - Aplastic anemia
    - Sequestration
    - Hyperhemolytic
  - Pain level, Hydration status, S&S of infection, Psychosocial status, Depression assessment
  - Clinical manifestations: pain in joints, abdominal pain, N/V, anorexia, SOB, fatigue, tachycardia, jaundice, muscle weakness, lethargy, irritability, impaired healing, priapism
  - Lab Tests:
    - CBC, Sickledex, Hemoglobin electrophoresis



Sickle Cell Anemia

- Interventions
  - Vaso-occlusive episode
    - Pain control, hydration, oxygenation, and rest
    - Blood transfusion if needed
    - Monitor I&O
    - Warm compresses
    - Oral PCN prophylactically
- Nursing considerations
  - Educate on preventing infection and dehydration
  - Provide emotional support
  - Maintain skin integrity
  - Avoid aspirin
  - Teach relaxation techniques

Hemophilia

- X-linked recessive disorders in which the child has an impaired ability to control bleeding
  - Clotting factors present in diminished capacity
- Affect males
- Females are the carriers and do not have the disease (except in very rare cases)
- Generally seen in infancy when the child is teething, crawling, or starting to walk
- Types:
  - Type A: deficiency in factor VIII
  - Type B: deficiency in factor IX (Christmas disease)
- Categorized as mild or severe based on the amount of clotting factor present

Hemophilia

- Assessment
  - Active or excessive bleeding with minor cuts
  - Reports of join pain or stiffness (**Hemarthrosis)**
  - Impaired mobility
  - Bleeding in the mouth or gums from teething
  - Hematuria
  - Tarry stools
  - Epistaxis
  - Lab Test:
    - PT, factor-specific assays, DNA testing

Hemophilia

- Interventions
  - Administration of clotting factor
    - Educate about storing and administering med
  - Corticosteroids
  - 1-deamino(8-D-arginine) vasopressin (DDAVP)
- Nursing considerations
  - Avoid rectal temps and suppositories
  - Avoid skin puncture procedures
  - No aspirin
  - Apply pressure for at least 5 minutes
  - Monitor stool, urine, and NG fluids for occult blood
  - Educate about injury prevention and low-impact sports
  - Educate how to monitor for bleeding

Transfusion Therapies

- Transfusion therapy:
  - Whole blood
  - Packed red blood cells
  - Platelets
  - Granulocytes
  - Fresh-frozen plasma
- Complications of transfusion therapy:
  - Febrile response, Urticaria, Hemolytic responses, Septic shock, Circulatory overload
- Special precautions:
  - Irradiated blood products, leukocyte-depleted products, CMV-negative products

Potential Complications

- Febrile responses
- Urticaria responses
- Hemolytic responses
- Septic shock
- Circulatory overload

Health History and Physical Assessment

- Assess if a child has received blood products before
  - Antibodies against the blood product are produced (alloimmunization)
    - More transfusions = More antibodies = More chances of transfusion reaction
    - Need premedicated: antipyretics, antihistamines, steroid anti-inflammatories
  - Before transfusion complete Head-to-Toe assessment and VS

NCLEX Question

A child requires a transfusion to improve the oxygen-carrying capacity of the blood. Which product should the nurse prepare to administer?

a. Platelets

b. Granulocytes

c. Fresh-frozen plasma

d. Packed red blood cells

Common Oncological Disorders

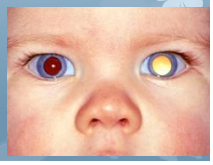
- Considered rare - < 1% of all cancers occur during childhood
- Majority of childhood cancers are considered curable – rate 70%-90%
- Prognosis of cancer depends on the type, extent of the cancer, rapidity of treatment, and effectiveness of therapy
- More than 250 types of childhood cancer
- Leading cause of death from diseases in childhood

Common Oncological Disorders

- Leukemia: most common malignant cancer in children
- Diagnostics:
- Psychosocial aspects: cultural considerations
- Safety considerations
  - PPE
  - Properly dispose of chemotherapy medications

Common Oncological Disorders

- Types - See Box 38-2 Childhood Cancers pg.. 714
  - Aplastic anemia
  - Hodgkin's lymphoma
  - Non-Hodgkin's Lymphoma
  - Neuroblastoma
  - Wilm's Tumor
  - Osteogenic Sarcoma
  - Retinoblastoma



Common Oncological Disorders

- Symptoms suggestive of pediatric cancers
  - Weight loss
  - Recurring febrile state
  - Chronic fatigue
  - Petechiae or abnormal bruising
  - Night sweats
  - Abdominal discomfort, distention, or masses
  - HA and vomiting in the morning
  - Significant bone pain
  - Visual disturbances

Common Oncological Disorders

- Treatment:
  - Chemotherapy
  - Surgery
  - Radiation
  - Biotherapy
  - Bone Marrow Transplant
  - Gene Therapy

Leukemia

- Most common form of childhood cancer
- Types:
  - Lymphocytic
  - Nonlymphocytic
- Acute lymphocytic leukemia (ALL)
  - Most commonly between ages 3 and 5
  - Excessive amount of immature leukocytes produced by bone marrow
  - Normal cells displaced by these cells
  - Causes an insufficient numbers of RBCs, other types of WBCs, and platelets to form
  - Places child at risk for and

Leukemia

- Assessment:
  - Early signs of cancer
    - Fever
    - Fatigue
    - Bleeding
    - Weight loss
    - Anorexia
  - Lab Tests
    - CBC with diff
    - Bone marrow aspiration
    - Lumbar puncture
    - Chest x-ray
    - Bone scans

Leukemia

- Interventions:
  - Chemotherapy:
    - Induction
      - Focuses on eradiating the disease or inducing a remission
    - Intensification
      - Goal of treatment is to combat any involvement of CNS or other organs
    - Maintenance
      - Receives several months to a year of chemotherapy to sustain remission

Leukemia

- Nursing considerations
  - Monitor for S&S of infection
  - Monitor for chemotherapy reactions
  - Monitor nutrition
  - Educate on treatment of child's Central Line
  - Provide emotional support
  - Prevent complications:
    - Neutropenia
    - Anemia
    - Thrombocytopenia

NCLEX Question

The mother of a child with leukemia asks why the chemotherapy is needed for months after the disease has been cured. What should the nurse respond?

a. "It sustains remission."

b. "It will rebuild the blood."

c. "It prevents the spread to any other organs."

d. "It prevents any central nervous system involvement."

- Katherine is a 16-year-old African American female admitted with vaso-occlusive sickle cell crisis. She complains of weakness and fatigue. After completing her assessment, you find Katherine has a fever of 100° F and has right-upper-quadrant abdominal pain with palpation.
  - In addition to the above, your assessment could also reveal what other clinical manifestations?
  - Katherine's parents are receiving instructions about their daughter's disease. Your teaching should include?

- Harris is a 2-year-old who was brought into the clinic with severe knee pain. The knee is swollen on inspection. His parents report Harris having a history of frequent nosebleeds and unexplained bruising.
  - The nurse suspects the child may have what condition?
  - What causes Harris's condition?
  - What is the course of treatment for Harris?

The End…….