

PROBLEMS OF THE HEMATOLOGICAL SYSTEM

UNIT 5

OBJECTIVES

- Review A & P of Hematological system
- Outline focused exam
- Differentiate and start to evaluate diagnostic exams used to assess problems of the hematological system
- Identify diversity concerns for patients at risk for: Leukemia, Lymphoma, & Lymphedema
- Differentiate clinical manifestations of various leukemia's and those affected by the disease
- Design a nutritional plan for patients with any of the following disorders: Leukemia, Lymphoma, and Lymphedema
- Summarize pharmacological agents used in treatment of hematological disorders such as Leukemia, Lymphoma, and Lymphedema
- Apply critical thinking skills and analyze nursing interventions when providing pain medications to clients with the following disorders: Leukemia, Lymphoma, and Lymphedema
- Utilize selected terms associated with hematological system
- Analyze surgical and non surgical interventions for the following disorders: Leukemia, Lymphoma, and Lymphedema
- Relate etiology, epidemiology, pathophysiology, clinical manifestations nursing diagnosis, implementation/interventions and medical management indicated for the following disorders: Leukemia, Lymphoma, and Lymphedema
- Point out important information needed when communicating to the physician or nurse regarding the client with the following disorders: Leukemia, Lymphoma, and Lymphedema
- Utilize nursing interventions in preventing Leukemia, Lymphoma and Lymphedema
- Select nursing interventions that will prevent complications associated with Leukemia, Lymphoma and Lymphedema
- Identify teaching principals and needs of the adult geriatric client, as a participant in the care with Apply critical thinking skills and analyze nursing interventions when providing pain medications to clients with the following disorders: Leukemia, Lymphoma, and Lymphedema

..Larger Review of A and P is independent



Anatomy and Physiology

- Bone Marrow
- Blood components
- Accessory organs or Hematopoiesis
- Homeostasis and blood clotting
- Hematologic changes with aging
- Anticoagulants, Fibrinolytics and Platelet Inhibitors

– Chapter 33 Lemone and Burke

Focused Health History

- Family and Genetic History
- Personal History (Blood thinners, ASA, NSAID)
- Diet History (alcohol, poor dietary intake)
- Socioeconomic Status (inability to buy food high in iron and protein)
- Current health problems (bleeding or bruising, D.O.E, fatigue, weight loss, infections)

Physical Assessment

- Skin
- Head and Neck
- Respiratory
- Cardiovascular
- Renal and Urinary
- Musculoskeletal
- Abdominal
- Central Nervous system

Skin

- Color (pallor or jaundice)
- Bleeding / Bruising
- Turgor
- Swelling
 - Lymphangitis (red streak w/ poss lesion present)
 - Lymphedema (swelling due to infection)
 - Edema (usually non-pitting)



Head and Neck



- Pallor or ulcerations
- Tongue
- Lymph nodes – document enlarged or painful nodes

Cardiovascular Assessment

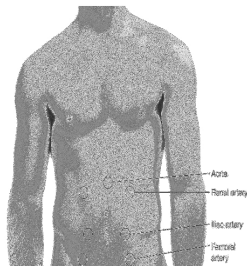
- Heaves (occurs during systole)
- Distended neck veins (30-45 degree angle)
- Edema
- Signs of phlebitis
- Murmurs
- Gallops (usually heard in diastole = Lu-dub-a)
- Irregular rhythms (palpitations, skipping)
- Abnormal Blood pressure (orthostatic)

Artery and Vein

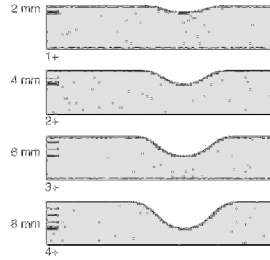
- Assessment to include
 - Symmetry
 - Rate
 - Rhythm
 - Volume
 - Amplitude
- Scale:
 - 0 = Absent
 - 1+ = Diminished
 - 2+ = Normal
 - 3+ = Increased
 - 4+ = Bounding

Abdominal Aorta Assessment

- Assess aorta
 - Aneurysm
 - Stenosis
 - Occlusion



Edema

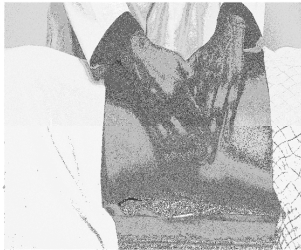


Abdominal Assessment

- The spleen is normally not palpable

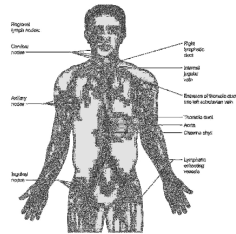
Liver:

- Normally the liver is palpable 4 to 5 cm below the right costal margin



Lymph Node Assessment

- Nodes should not be enlarged (greater than 1 cm) or painful



Respiratory Assessment

- Rate
- Depth
- Activity Tolerance
- Sleep behaviors

Renal and Urinary Assessment

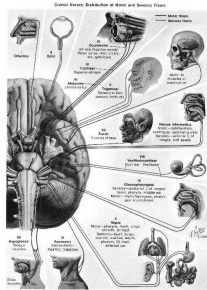
- Urine color
 - Overt blood
 - Occult blood
- Protein

Musculoskeletal Assessment

- Tenderness
- Joint mobility
 - Swelling
 - Pain

Central Nervous System

- Cranial Nerves
- Neurologic function
- Fever
- Chills
- Night sweats



Hematologic Laboratory Assessment

- Complete blood count
- Reticulocyte Count
- Hemoglobin Electrophoresis
- Leukocyte Alkaline Phosphatase
- Coombs Test
- Serum Ferritin, Transferrin and Total Iron Binding Capacity
- PT/INR/PTT

Radiographic Assessments

- Radioactive Isotope Imaging
- Bone Marrow Aspiration and Biopsy
- <http://www.youtube.com/watch?v=svTQ-zJHY9M>

Leukemia

Leukemia

- Acute or chronic
- Classified by cell type and acuity
 - Acute lymphoblastic leukemia (ALL)
 - Chronic lymphocytic leukemia (CLL)
 - Acute myeloid leukemia (AML)
 - Chronic myeloid leukemia (CML)

Acute Myeloid Leukemia

- Uncontrolled proliferation of myeloblasts
- Most common adult leukemia
- Remission occurs with treatment in 70% of clients
- Only 25% achieve a cure

Chronic Myeloid Leukemia

- Abnormal proliferation of all bone marrow elements
- Usually associated with Philadelphia chromosome (22 to 9)
- 20% of adult leukemia's affecting older adults
- Evolves to acute leukemia in its final stage

Acute Lymphocytic Leukemia

- Most common childhood leukemia
- Abnormal proliferation of lymphoblasts in bone marrow, lymph nodes and spleen
- Combination chemotherapy produces complete remission in 80-90% of adults with ALL

Chronic Lymphocytic Leukemia

- Proliferation and accumulation of small, abnormal, mature lymphocytes
- Found in bone marrow, peripheral blood, and body tissues
- Usually affects older adults
- Slow progressive course
- Survival rate is about 7 years

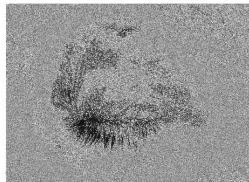
Causes of Leukemia

- Most are unknown
- Risk factors
 - Down syndrome
 - Exposure to ionizing radiation
 - Treatment for other cancers
 - Exposure to certain chemicals and drugs
 - Bone marrow hypoplasia
 - Other genetic factors

Clinical Manifestations

- Integument (petechiae, bruising, skin infections, lymphadenopathy, pallor and fever)
- Intestinal manifestations (Nausea/Vomiting, weight loss, splenomegaly and hepatomegaly)
- Renal (UTI, Hematuria)
- Cardiovascular (Tachycardia)
- Respiratory (URI, epistaxis, dyspnea)
- Central nervous system (lethargy)
- Musculoskeletal (Bone pain, joint swelling)

- Increased bleeding due to thrombocytopenia
 - bruising,
 - petechiae
 - bleeding gums and
 - bleeding within specific tissues



Laboratory Assessment

- **Decreased hemoglobin and hematocrit levels**
- **Low platelet count**
- **Abnormal white blood cell count, may be low, normal or elevated, but is usually quite high**
- **Poorer prognosis: client with high white blood cell count at diagnosis**
- **Definitive test: examination of cells obtained from bone marrow aspiration and biopsy**

Risk for Infections

- **Infection is a major cause of death in the client with leukemia, and sepsis is a common complication.**
 - Autocontamination
 - Cross-contamination

Drug Therapy for Acute Leukemia

- **Induction therapy**
- **Consolidation therapy**
- **Maintenance therapy**
- **New drug therapies**
- **Drug therapy for infection**

Infection Protection

- Frequent handwashing
- Private room
- HEPA filtration or laminar airflow system
- Mask for visitor with upper respiratory infection

(Continued)

Infection Protection *(Continued)*

- “Minimal bacteria diet” without uncooked foods
- Monitoring of daily laboratory results
- Assessment of vital signs
- Skin care, respiratory care

Bone Marrow Transplantation

- Standard treatment for leukemia
- Purges present marrow of the leukemic cells
- After conditioning, new, healthy marrow given to the client toward a cure
- Sources of stem cells
- Conditioning regimen
- Transplantation

Risk for Injury

- Nadir: period of greatest bone marrow suppression
- Bleeding precautions
- Fatigue
- Interventions:
 - Diet therapy
 - Blood replacement therapy
 - Drug therapy
 - Energy conservation

Case study

- Mr McCann, an 80 year old Caucasian male
- Hx of frequent sinus infections
- Current condition Cholecystitis, leukocytosis
- Socio – retired firefighter with 2 grown children

Work up/Treatment

- On arrival to the ED his temperature is 103 degrees F
- WBC count on admission is 35,900
- A gallbladder US revealed a stone with sludge present.
- Levofloxacin and Flagyl were ordered IV

Day 4

- WBC remains elevated - 25,900
- No lymphadenopathy or splenomegaly
- Negative Hepatitis Negative mononucleosis screen
- Urine analysis defines no abnormality
- A Lap cholecystectomy is recommended

Day 11

- WBC 30,500
- Referral to an oncologist
- Diagnosis

- Prioritize three nursing diagnosis appropriate for Mr McCann at this stage of his chronic illness

- Identify three components of a teaching plan to educate ways to reduce his of infection

- Identify at least five nursing interventions to address coping needs and include at least one community resource

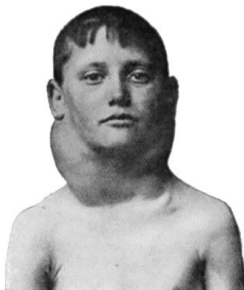
Lymphoma

- Lymphoid tissue malignancies
- Proliferation of lymphocytes, monocytes and macrophages
- Closely related to lymphocytic leukemias
- 2 types
 - Non-Hodgkins
 - Hodgkins

Hodgkin's Lymphoma

- Cancer that starts in a single lymph node or a single chain of nodes
- Large, painless lymph node usually in the neck; fever, malaise, night sweats
- Marker: Reed-Sternberg cell
- One of the most curable cancers
- Treatment: external radiation alone or with combination chemotherapy

Hodgkin's Lymphoma



Non-Hodgkin's Lymphoma

- More common than Hodgkins disease affecting more than 56,000 annually
- More than 12 types of non-Hodgkin's lymphoma
- No known cause
- Risk factors: immunosupression, HIV, Leukemia, Epstein Barr Virus and other genetic factors
- Spread early to other lymphoid tissues and organs
- Low-grade – slow progress; less responsive to treatment; cures are rare
- High grade-rapid growth , responsive to chemotherapy

Manifestations

- Early: painless lymphadenopathy, localized or widespread
- Fever, night sweats, fatigue, and weight loss
- Abdominal pain, nausea and vomiting
- Headaches, altered mental status, possible seizures if CNS involvement

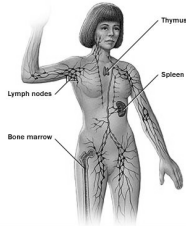
Diagnostics and Treatment

- Chest x-ray and CT scan to identify abnormal or enlarged nodes
- Biopsy
- Combination chemotherapy
- Radiation therapy
- Total nodal irradiation for advanced disease

B Cell Non Hodgkin's Lymphoma



Lymphedema



Lymphedema

- Inability to drain lymph fluid from the arm or legs
 - Primary – occurs on its own
 - Secondary caused by another disease process
 - Milroy disease
 - Meige disease
 - Late onset
- Chapter 35 pages 1199-1201

Nursing Diagnosis

- Fatigue
- Nausea
- Disturbed Body image
- Sexual Dysfunction
- Risk for impaired skin integrity
