PROBLEMS OF THE HEMATOLOGICAL SYSTEM

UNIT 5

OBJECTIVES

• Review & 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 leukemias and those affected by the disease
• Design a nutrition 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 medication to clients with the following disorders: Leukemia, Lymphoma, and Lymphedema
• Identify teaching principles and needs of the adult geriatric client, as a participant in the care

..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=syTQ-zHY9M
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 spleenomegaly
- 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

Non-Hodgkin’s Lymphoma

- More common than Hodgkin’s 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

- 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

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Nursing Diagnosis

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