

Unit 7: Hematology

Chapter 29 & 30

ONLINE CONTENT (1.5 H)

Complete the worksheet and submit in the Unit 7: Hematology dropbox by March 20, 2023 at 0800. Please be sure to bring a copy to class on March 20, 2023.

Table 1	Iron Deficiency Anemia	Thalassemia	Cobalamin (Vitamin B₁₂) Deficiency	Folic Acid Deficiency
Etiology	<p>Develops because of inadequate dietary intake, malabsorption, blood loss, or hemolysis.</p> <ul style="list-style-type: none"> - May be inadequate for people with higher iron needs (menstruating or pregnant women) 	<p>Group of diseases involving inadequate production of normal Hgb - decreases RBC production.</p> <ul style="list-style-type: none"> - Commonly found in members in ethnic groups where origins are near Mediterranean Sea or near equatorial regions 	<p>Absence of intrinsic factor secreted by gastric mucosa - required for cobalamin to be absorbed</p>	<p>Needed for DNA synthesis leading to RBC formation and maturation</p>
Clinical Manifestations	<p>Many not have any symptoms. Chronic: Pallor, glossitis, cheilitis, headache, paresthesia, and a burning sensation of the tongue</p>	<p>Minor: Often asymptomatic - microcytosis, hypochromia, mild splenomegaly, bronzed color of skin, and bone marrow hyperplasia Major: Growth physical and mental are slowed, pale, jaundice, splenomegaly, hepatomegaly, cardiomyopathy, diabetes, growth retardation, hypogonadism, osteoporosis, pulm HTN, thrombosis</p>	<p>Develop because of tissue hypoxia.</p> <ul style="list-style-type: none"> - GI: sore, red, beefy and shiny tongue, anorexia, N/V, abdominal pain - Neuromuscular: weakness, paresthesia of hands and feet, reduced position senses, ataxia, impaired thought process. 	<p>-diarrhea, stomatitis, cheilosis, dysphagia, flatulence</p>
Diagnostic Studies	<p>Labs Stool occult blood test Endoscopy and colonoscopy Bone marrow biopsy</p>	<p>Minor: doesn't need any - body adapts Major: labs Splenectomy Hepatic, heart, lung functions monitored. Stool occult blood test</p>	<p>Labs Stool occult blood test</p>	<p>Labs Stool occult blood test</p>
Drug Therapy	<p>Oral iron</p>	<p>No specific drugs/diet therapies are effective in treating Chelating agents to</p>	<p>Parenteral vitamin B12 or intranasal cyanocobalamin 1000 mcg/day of</p>	<p>Replacement therapy 1 mg/day PO Malabsorption pt: 5</p>

		reduce iron overloading during transfusions - Deferasirox, Deferiprone, or IV subcutaneous deferoxamine Zinc supplements - therapy Ascorbic acid supplements - therapy	cobalamin IM for 2 weeks then weekly until Hgb in normal range then monthly for life	mg/day
Nursing Management	-Subjective data: health hx, medications, surgery, dietary hx, functional health patterns -Objective: assess integumentary, respirations, cardiovascular, neuro, general -Z track method when doing IM iron injections -Use separate needles when drawing up iron and administering (may stain skin) -Stress adherence with dietary and drug therapy -Reassess Hgb and RBC count	-Subjective data: health hx, medications, surgery, dietary hx, functional health patterns -Objective: assess integumentary, respirations, cardiovascular, neuro, general -Major: blood transfusions - Hematopoietic stem cell transplantation is only cure - risk may outweigh benefits	-Subjective data: health hx, medications, surgery, dietary hx, functional health patterns Objective: assess integumentary, respirations, cardiovascular, neuro, general -Assess for neuro deficiency -reduce risk for injury due to decreased sensitivity to heat	-Subjective data: health hx, medications, surgery, dietary hx, functional health patterns Objective: assess integumentary, respirations, cardiovascular, neuro, general -teach pt to eat foods high in folic acid

Table 2	Anemia of Chronic Disease	Aplastic Anemia	Acute Anemia due to blood loss	Chronic Anemia due to blood loss
Etiology	Can be caused by cancer, autoimmune and infectious disorders, HF, or chronic inflammation. Associated with an underproduction of RBC and mild shortening of RBC survival	Immune system attacks the stem cells in bone marrow	-abrupt drop in RBC due to hemolysis, acute hemorrhage, surgery, childbirth, injury -disrupt vascular integrity	-similar to iron-deficiency anemia: bleeding ulcer, hemorrhoids, menstrual and postmenopausal blood loss
Clinical Manifestations	Fatigue, pallor, lightheadedness, shortness of breath, tachycardia, irritability, chest pain	Fatigue, shortness of breath, tachycardia, pallor, frequent infections, unexplained bruising, nosebleeds, prolonged bleeding times	-Fatigue, weakness, pale or yellow skin, irregular HR, SOB, Dizziness, chest pain, cold hands and feet	-Fatigue, weakness, pale or yellow skin, irregular HR, SOB, Dizziness, chest pain, cold hands and feet

Diagnostic Studies	-Labs: High serum ferritin Increased iron stores distinguish it from iron-deficiency anemia Normal folate and cobalamin blood levels	-Bone marrow biopsy, aspiration, and pathologic examination -Labs: Hgb, WBC, reticulocyte, and platelets are decreased. Iron levels high	-Labs can't be diagnosed right away -once plasma volume is replaced, RBC, Hgb, and Hct levels are low	-labs: CBC Reticulocyte count Serum Ferritin level Serum iron level C-reactive protein level Bone marrow examination
Drug Therapy	-blood transfusions -Erythropoietin used for anemia related to renal disease and cancer therapies (use limited due to risk of a thromboembolism)	Anti-thymocyte globulin, steroids and cyclosporine or cyclophosphamide	-iron preparations are given PO or IV -In emergency: dextran, hetastarch, albumin, and lactated ringers -Platelets, plasma	-supplemental iron
Nursing Management	<ul style="list-style-type: none"> - Oxygen - Pain relievers - Fluids - Blood transfusions - Folic acid supplements - antibiotics 	-prevent infection and hemorrhage -Immunosuppressive therapy	-replace fluid volume to prevent shock -find source of hemorrhage - stop it	-find bleed and stop it

Table 3	Acquired Hemolytic Anemia	Hemochromatosis	Polycythemia
Etiology	-destruction of RBC caused by extrinsic factors like antibody reactions, infectious agents and toxins, and physical destruction	-iron overload disorder although genetic defect is most common cause	-production and presence of increased numbers of RBCs - impairs blood viscosity and volume Primary: Decrease in RBC, WBC, and platelets Secondary: hypoxia related - stimulation of erythropoietin in kidneys which then stimulates RBC production
Clinical Manifestations	-weakness, pallor, jaundice, dark-colored urine, fever, inability to do physical activity, heart murmurs	-fatigue, arthralgia, impotence, abdominal pain, weight loss, liver enlargement, and eventually liver cirrhosis, skin pigment changes (bronze), diabetes, heart problems, arthritis, testicular atrophy	-headaches, blurred vision, red skin (face, hands, feet), tiredness
Diagnostic Studies	Labs: CBC: Hgb and Hct	-Genetic testing -Labs: high serum iron, TIBC, serum ferritin -Liver biopsy	Labs: High Hgb and RBCs with microcytosis, low to normal EPO level (secondary has a high level), high WBC count with basophilia and neutrophilia, high platelet count and platelet dysfunction, high

			leukocyte alkaline phosphatase, uric acid, and cobalamin levels, Bone marrow exam shows hypercellularity of RBCs, WBCs, and platelets.
Drug Therapy	-corticosteroids -Blood products -Removing spleen Folate replacement	-Iron chelating agents (Deferoxamine - IV or subQ) (Deferasirox and deferiprone PO)	-myelosuppressive agents -anagrelide - reduces platelet count and aggregation -low dose aspirin - prevent clotting -pegylated interferon- given to child-bearing age or those with intractable puritis -allopurinol -reduce number of acute gouty attacks
Nursing Management	-supportive care until causative agent can be eliminated or less injurious to RBC's Emergency therapy: aggressive hydration and electrolyte replacement to avoid kidney injury caused by Hgb clogging kidney tubules and subsequent shock	-remove excess iron from body: remove 500 mL of blood from body each week for 2-3 years Teach to avoid vitamin C, uncooked seafood, iron supplements, and iron rich foods Management of organ involvement.	<ul style="list-style-type: none"> - Reduce hematocrit to below 45% - 300-500 mL of blood removed every few days - Hydration therapy - Teach to avoid iron supplementation - Assess I&Os (avoid fluid overload) - Teach pt about drug side effects - Give drugs as ordered