

Unit 7: Hematology
Chapter 33 & 34
ONLINE CONTENT (2H)

Complete the worksheet and submit in the Unit 7: Hematology dropbox by March 18, 2024 at 0800. Please be sure to bring a copy to class on March 18, 2024.

Table 1	Iron Deficiency Anemia	Thalassemia	Cobalamin (Vitamin B₁₂) Deficiency	Folic Acid Deficiency
Etiology	May develop from inadequate diet intake, malabsorption, blood loss, or hemolysis. Iron malabsorption may occur after certain types of gastrointestinal surgeries and in malabsorption syndromes.	A group of diseases involving inadequate production of normal hemoglobin which decreases red blood cell production. Due to an absent or reduced globin protein.	Normally the parental cells of the gastric mucosa secrete IF. IF is required for absorption. We absorb cobalamin in the ileum.	Can cause megaloblastic anemia. Folic acid is needed for DNA synthesis leading to RBC formation and maturation
Clinical Manifestations	may not have any symptoms. As it becomes chronic pallor may occur, glossitis, cheilitis, headache, burning sensation of the tongue, and paresthesia.	Often asymptomatic but can have microcytosis and hypochromia, mild splenomegaly, bronzed skin color, and bone marrow hyperplasia. Major thalassemia can cause pale, jaundice skin.	GI manifestations include a sore, red, beefy, and shiny tongue, anorexia, n/v, and abdominal pain. Neuromuscular manifestations include weakness, reduced vibratory and position senses, ataxia, muscle weakness, and impaired cognition.	GI problems may include stomatitis, cheilosis, dysphagia, flatulence, and diarrhea Can present with neurological symptoms as well
Diagnostic Studies	lab work, stool occult blood tests, endoscopy, colonoscopy, and a possible bone marrow biopsy if all tests are inconclusive	laboratory values	through laboratory data reflects deficiency RBC's appear larger and have abnormal shapes	decrease hemoglobin, increased MCV
Drug Therapy	- ferrous sulfate for oral IM or IV iron dextran, sodium ferrous gluconate, iron sucrose	Oral Deferirone, IV Subcutaneous deferoxamine	Cobalamin administration B12 or intranasal cyanocobalamin.	Folic acid deficiency with replacement therapy usually is 1 to 5 milligrams per day by mouth the duration is dependent on the reason for the

				deficiency
Nursing Management	<ul style="list-style-type: none"> - main goal is to treat the underlying problem that is causing the iron loss. - We also direct efforts towards replacing iron - teach the patient which foods are good sources of iron 	<p>Minor does not need treatment because the body adapts to the reduction of normal hemoglobin</p> <p>Major includes blood transfusions or exchange transfusions in conjunction with agents that bind to iron</p>	<p>assessed for neurological problems that are not corrected by replacement therapy</p> <p>implement measures to reduce the risk for injury from the decreased sensitivity to heat and pain to protect patient from falling, burns, traumas</p> <p>they may need physical therapy,</p>	<p>teach the patient to eat foods high in folic acid</p> <p>patients with anemia are appropriate for the patient with folic acid deficiency anemia nursing care</p>

Table 2	Anemia of Chronic Disease	Aplastic Anemia	Acute Anemia due to Blood Loss	Chronic Anemia due to Blood Loss
Etiology	<ul style="list-style-type: none"> - usually develops over one to two months of - - disease activity causes include cancer, autoimmune and infectious disorders, heart failure, or chronic inflammation - anemia of chronic disease is associated with an underproduction of RBC's in mild shortening of RBC survival - 	<p>is it a disease in which the patient has peripheral blood pancytopenia and hypocellular bone Marrow. Due to autoimmune activity by auto reactive T lymphocytes. The cytotoxic T cells target and destroy the patient's own hematopoietic stem cells or inherited stem cell defect</p>	<ul style="list-style-type: none"> - sudden bleeding - causes of acute blood loss include trauma, surgery complications, and problems that disrupt vascular integrity - a sudden reduction in the total blood volume can lead to hypovolemic shock - the acute loss of blood is more gradual and the body maintains its blood volume by slowly increasing the plasma volume 	<ul style="list-style-type: none"> - the sources of chronic blood loss are similar to those of iron deficiency anemia - the effects of the chronic blood loss are usually due to depleted iron stores
Clinical Manifestations	<p>Fatigue, paleness, lightheadedness, SOB, tachycardia, irritability, and Chest pain</p>	<ul style="list-style-type: none"> - manifestations can occur abruptly or insidiously - may have symptoms caused by suppression of any or all bone marrow elements - enroll manifestations are fatigue and dyspnea as well as cardiovascular and cerebral responses 	<ul style="list-style-type: none"> - a patient can experience different types of symptoms based on the degree of blood loss they have - the signs and symptoms the patient has are more important than the laboratory values - pain can occur in internal bleeding 	<ul style="list-style-type: none"> - blood pressure falls and people may get dizzy - fatigue, shortness of breath, and pale

		may occur		
Diagnostic Studies	Blood work	- laboratory studies confirm the diagnosis because a plastic anemia affects all marrow elements such as hemoglobin, white blood cells, and platelet values are decreased - bone marrow biopsy, aspiration, and pathological examination will be done to confirm laboratory findings.	- laboratory data do not reflect the red blood cell loss values may seem normal or high however once a plasma volume is replaced the red blood cell mass is less concentrated	- iron studies are helpful in the diagnosis -
Drug Therapy	blood transfusion may be needed	- immunosuppressant therapy with antithymocyte globulin and cyclosporine - oral thrombopoietin receptor agonist can increase platelet count	- blood transfusions can be used depending on the volume of loss - IV fluids used in emergencies include volume replacement fluids or colloids that pull fluids into the vascular space	- patient may need iron supplements
Nursing Management	Best treatment is to correct the underlying problem if not blood transfusion may be needed EPO therapy is used for anemia from renal disease and cancer and its therapies	- prevent complications from infections and bleeding	- replacing blood volume to prevent shock -promoting coagulation to prevent further bleeding - finding the source of the bleeding and stopping the blood loss	- management of chronic blood loss anemia involves identifying the source and stopping the bleeding

Table 3	Acquired Hemolytic Anemia	Hemochromatosis	Polycythemia
Etiology	- results from hemolysis of RBC's from extrinsic factors - factors include physical destruction, antibody reactions, infectious agents and toxins	- an iron overload disorder characterized by increased intestinal iron absorption - a genetic defect is the most common cause - it may occur with diseases such as other types of anemia and liver disease	- there are two types primary or Poly and secondary - primary is a chronic disorder and involves can't read any of that increased production not only of red blood cells but also white

			<p>blood cells and platelets</p> <ul style="list-style-type: none"> - this leads to enhanced blood viscosity and blood volume and congestion of organs and tissues with blood - secondary can be either hypoxia driven or hypoxia independent - the need for O2 may result from high altitude lung disease, cardiovascular disease, hypoventilation
Clinical Manifestations	<ul style="list-style-type: none"> - Weakness, paleness, jaundice, dark colored urine, fever, inability to do physical activity, and a heart murmur 	<ul style="list-style-type: none"> - symptoms usually do not develop until the age 40 in men and 50 in women - early symptoms are not specific they include fatigue, arthralgia, impotence, abdominal pain and weight loss - Later signs are iron accumulates in the liver and causes liver enlargement and cirrhosis 	<ul style="list-style-type: none"> - fatigue, weakness, headaches, dizziness, nosebleeds, bleeding gums, heavy menstrual periods, and bruising
Diagnostic Studies	<ul style="list-style-type: none"> - blood film examination Reticulocyte count Direct antiglobulin test (coombs) - LDH -Urinalysis 	<ul style="list-style-type: none"> - laboratory values show a high serum iron - testing for non genetic mutation confirms diagnostic - MRI can measure liver and cardiac iron - liver biopsy can help see the amount of iron and establish the degree of organ damage 	<ul style="list-style-type: none"> - blood work that includes high hemoglobin, high hematocrit, and red blood cell mass - bone marrow examination showing hypercellularity of red blood cells, white blood cells, and platelet
Drug Therapy	<ul style="list-style-type: none"> - Folate replacement - Immunosuppressive therapy such as glucocorticoids or rituximab - Severe cases hemodialysis - Eculizumab - corticosteroids and blood products 	<ul style="list-style-type: none"> - Iron-chelating drugs may be used - Deferixamine removes iron via kidneys 	<ul style="list-style-type: none"> - Myelosuppressive agents such as hydroxyurea - Ruxolitinib inhibits a mutation
Nursing Management	<ul style="list-style-type: none"> - general supportive care until the causative agent can be eliminated or at least made less injurious to the RBC's - if a hemolytic crisis 	<ul style="list-style-type: none"> - goal of treatments remove excessive iron from the body and minimize any symptoms the patient may have 	<ul style="list-style-type: none"> - assess intake and output during hydration therapy to avoid fluid overload - observe the patient and teach them about drug side effects

	occurs aggressive hydration and electrolyte replacement to reduce the risk for kidney injury caused by hemoglobin clogging the kidneys		- assess the patient's nutrition status and inadequate food intake can result from GI symptoms
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In order to receive full credit (2H class time) for this assignment, it must be completed in its entirety by the due date/time assigned. Any assignment not completed in its entirety by the due date and time will result in missed class time and must be completed by the end of the semester to pass the course.