22/10/2022 – Pathology - Anemia – WEBPATH – Ahmad AlHurani

Lab references: (normal ranges): https://webpath.med.utah.edu/EXAM/labref.html

A 16-year-old boy has had a low energy level for as long as he can remember. On physical examination he has a palpable spleen tip. A CBC shows Hgb of 8.8 g/dL, Hct 24.1%, MCV 65 fL, platelet count 187,000/microliter, and WBC count 7400/microliter. His serum ferritin is 3740 ng/mL. A bone marrow biopsy is performed and on microscopic examination reveals a myeloid:erythroid ratio of 1:4, and there is 4+ stainable iron. Which of the following is the most likely diagnosis?

A G6PD deficiency

B Beta-thalassemia

C Sickle cell anemia

D Hereditary spherocytosis

E Malaria

Ans: B

A 20-year-old woman has had worsening fatigue for the past year. On examination her mucus membranes are pale. No hepatosplenomegaly is present. Her CBC shows a Hgb of 7.1 g/dL, Hct 19.9%, MCV 67 fL, platelet count 190,000/uL, and WBC count 5,400/uL. There is no history of drug ingestion. Which of the following is the most likely etiology for her findings?

A Cobalamin deficiency

B G6PD deficiency

C Folate deficiency

D Iron deficiency

E Von Willebrand factor deficiency

(D) CORRECT. The only finding here is microcytosis, and the most common cause is iron deficiency, and women of reproductive years are at increased risk.

A 25-year-old man is given anti-malarial prophylaxis for a trip to West Africa. Over the next week he develops increasing fatigue. On physical examination there are no abnormal findings. Laboratory studies show a hematocrit of 30%. Examination of his peripheral blood smear shows red blood cells with numerous Heinz bodies. There is a family history of this disorder, with males, but not females, affected. Which of the following is the most likely diagnosis?

A Beta-thalassemia

B Sickle cell anemia

C Alpha-thalassemia

D Hereditary spherocytosis

E G6PD deficiency

(E) CORRECT. He has glucose-6-phosphate dehydrogenase (G6PD) deficiency, which can result in a hemolytic anemia on exposure to oxidizing agents including certain drugs such as antimalarials. This is an X-linked disorder. The Heinz bodies within the RBCs are formed from denatured hemoglobin.

A 51-year-old man has become increasingly fatigued for the past 10 months. On physical examination there are no abnormal findings. Laboratory studies show his Hgb is 9.2, Hct 27.9%, MCV 132 fL, platelet count 242,000/microliter, and WBC count 7590/microliter. Which of the following morphologic findings is most likely to be present on examination of his peripheral blood smear?

A Hypersegmented neutrophils

B Nucleated red blood cells

C Blasts with Auer rods

D Hypochromic, microcytic RBC's

E Schistocytes

Ans: A

A 19-year-old primigravida of Southeast Asian ancestry gives birth at 35 weeks gestation a male infant. On physical examination the infant is markedly hydropic. Laboratory studies show his hematocrit is 17% and the peripheral blood smear reveals numerous nucleated red blood cells and even a few erythroblasts. The red blood cells display marked anisocytosis and poikilocytosis. Which of the following diseases is most likely to be present in this infant?

A Sickle cell anemia

B Alpha-thalassemia

C Hemoglobin E disease

D G6PD deficiency

E Hereditary elliptocytosis

Ans: B

A 38-year-old woman has become increasingly fatigued for the past 3 months. During the past week she has noted purple blotches on her skin. On physical examination there are purpuric areas of skin on her trunk and extremities. She has no hepatosplenomegaly and no lymphadenopathy. Laboratory studies show Hgb 6.8 g/dL, Hct 20.7%, MCV 91 fL, platelet count 28,760/microliter, and WBC count 1940/microliter. Which of the following is the most likely diagnosis?

A Aplastic anemia

B Myeloproliferative disorder

C Immune thrombocytopenic purpura

D Large B cell lymphoma

E Hereditary spherocytosis

(A) CORRECT. There is evidence from the peripheral cytopenias for marked hypocellularity of the bone marrow with aplastic anemia. The spleen is of normal size with aplastic anemia. The 'aplasia' here refers to the three major cell lines: myeloid, and megakaryocytic as well as erythroid.

Hematopathology

For each of the following patient histories, match the most closely associated lettered hematologic condition that produces anemia:

1. [ ] A 20-year-old primigravida from Hanoi, Vietnam, delivers a stillborn fetus at 30 weeks gestation. The stillborn is markedly hydropic, as is the placenta. No congenital anomalies are noted:

2. [ ] A 15-year-old adolescent notes the passage of dark urine. He has a history of multiple respiratory infections with *Hemophilus influenzae* and *Escherichia coli* over the past several years. He has a history of venous thromboses, including portal vein thrombosis last year. A complete blood count shows a hemoglobin of 9.8 g/dL, hematocrit 29.9%, MCV 92 fL, platelet count 150,000/microliter, and WBC count 3,800/microliter with differential count 24 segs, 1 band, 64 lymphs, 10 monos, and 1 eosinophil. He has a reticulocyte count of 5.5%. His serum haptoglobin is found to be very low:

3. [ ] ~~A 32-year-old woman has noted numerous bruises over her skin even without significant trauma for the past 2 months. A CBC shows Hgb 12.9 g/dL, Hct 38%, MCV 90 fL, platelet count 19,000/microliter, and WBC count 5650/microliter. On exam there is no hepatosplenomegaly or lymphadenopathy:~~

4. [ ] A 19-year-old woman is in the third trimester of her first pregnancy. She has malaise. On examination she appears pale. A CBC shows Hgb 8.4 g/dL, Hct 23.7%, MCV 71 fL, platelet count 362,000/microliter, and WBC count 5660/microliter:

5. [ ] An 11-year-old girl has had numerous infections with encapsulated bacterial organisms cultured over the past 2 years. On examination there is no hepatosplenomegaly or lymphadenopathy. A CBC shows Hgb 8.3 g/dL, Hct 24.5%, MCV 85 fL, platelet count 229,000/microliter, and WBC count 11,450/microliter:

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A. Acute blood loss	B. Alpha-thalassemia major	C. Anemia of chronic disease	D. Beta-thalassemia major
~~E. Disseminated intravascular coagulation~~	F. Erythroblastosis fetalis	G. Hemoglobin C disease	H. Hemolytic-uremic syndrome
I. Hereditary spherocytosis	~~J. Idiopathic thrombocytopenic purpura~~	K. Iron deficiency anemia	L. Megaloblastic anemia
M. Paroxysymal nocturnal hemoglobinuria	N. Sickle cell anemia	O. Thrombotic thrombocytopenic purpura	P. Warm autoimmune hemolytic anemia

Forget about question 3

Answers :

1 – B

2 – M

4 – K

5 – N