

Case 9

B.S. is a 5 year old Dominican girl who presented with a cough productive of yellow sputum and an infiltrate on CXR. She was in good health until one week prior to admission when she developed fever, chills, night sweats, and a cough productive of yellow sputum. She presented to a physician who planted a PPD, told her she had “walking pneumonia,” and prescribed oral ceftriaxone. Her fever and cough persisted and after 7 days she complained of shortness of breath and light-headedness. Physical examination was notable for a temperature of 102.6, coarse breath sounds and marked conjunctival pallor. Laboratory investigations was notable for a hemoglobin of 7.1 g/dl, hematocrit 21%, and white blood cell count of 23,200/mm³. Peripheral blood smear displayed evidence of hemolysis with anisopoikilocytosis and polychromatic microspherocytes. The reticulocyte count was 7% (increased due to compensatory increase in erythrocyte production by the bone marrow). Total bilirubin was 3.5 mg/dL (elevated) and lactate dehydrogenase was 4,350 U/L (markedly elevated). Tests for glucose 6-phosphate dehydrogenase and pyruvate kinase deficiency were normal. A Direct Antiglobulin Test (DAT) was strongly positive for anti-IgG alone (but not for anti-C3d). Anti-streptolysin O titer, C3, C4 and serum total-IgE levels were normal. Serological tests for hepatitis B, cytomegalovirus, *Mycoplasma hominis*, Epstein-Barr virus and HIV were negative. Throat swabs, blood and urine cultures were negative. The patient received IV fluids and 2 units of packed RBCs. Ceftriaxone was discontinued and clarithromycin was used instead. The patient improved clinically and was discharged on the 6th hospital day.

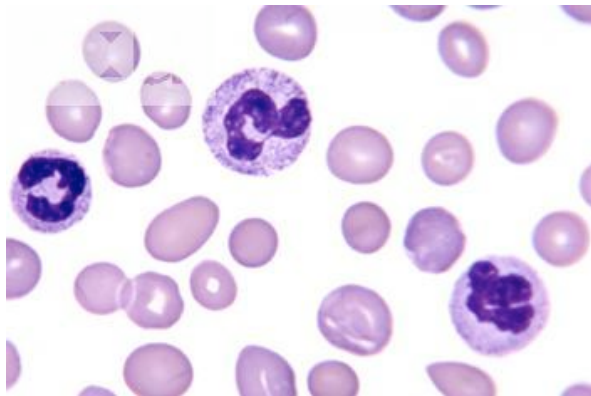


Fig. 1. Peripheral blood smear of B.F on admission. Note variation in size (anisocytosis), shape (poikilocytosis), and color of abnormally spherical erythrocytes (polychromatic spherocytes).

Questions for Case 9

1. Although rare, cephalosporin-induced hemolytic anemia can be severe and potentially life-threatening. Explain potential immune mechanisms underlying its occurrence. Why did it take a week to develop following administration of the drug?
2. What is a DAT (often called “Direct Coombs test”) and how is it performed? What is an indirect DAT (“Indirect Coombs test”)?
3. There are multiple causes of hemolytic anemia in addition to drug-induced hemolytic anemia.

Name some other causes of hemolytic anemia. How does *Mycoplasma* cause hemolytic anemia?

4. What is a PPD and how is it performed? What would a biopsy of a PPD look like? What cytokines are involved in the generation of a positive PPD?