Premature labor and leukoerythroblastosis in a newborn with parvovirus b19 infection

Leukoerythroblastosis is a rarely observed disease characterized by the presence of leukocytosis, erythroid and myeloid blast cells in peripheral blood. As to our knowledge, it was not diagnosed in a premature newborn before. A female case of 1164 grams who was born prematurely at 29th week of gestation by cesarean section was referred to our newborn intensive care unit due to prematurity and respiratory distress with no prenatal pathological findings. Physical examination revealed tachypnea and hepatosplenomegaly. Routine laboratory measurements of the case showed significant leukocytosis (85.000/mm³) and anemia (Hb: 9.6 gr/dL and Hct: 27.6%). Thrombocyte count was normal. Peripheral blood smear suggested leukoerythroblastosis with the presence of nucleated erythrocyte, monocytosis, and 4% blasts. Bone marrow cytogenetic examination was normal. Parvovirus B19 Ig G and M serology were detected to be positive. The etiological factors observed in leukoerythroblastosis occurring during neonatal and early childhood period are congenital-postnatal viral infections, juvenile myelomonocytic leukemia and osteopetrosis. As to our knowledge, no case diagnosed with leukoerythroblastosis in such an early phase is avaliable in literature. As a result, premature delivery and leukoerythroblastosis presentation was thought to develop secondary to intrauterine parvovirus B19 infection.

Haematologica 2005; 90:(11)e107-e108

Leukoerythroblastosis is a rarely observed disease characterized by the presence of leukocytosis, erythroid and myeloid blast cells in peripheral blood. It is reported that it can be observed following hematologic malignancies especially juvenile myelomonocytic leukemia, acute infections, hemolytic anemia, osteopetrosis, myelofibrosis, neuroblastoma and taking medicines of hematinic features.[1-3] As to our knowledge, it was not diagnosed in a premature newborn before. In this paper, a newborn who was referred to intensive care unit due to being born prematurely at 29th week and diagnosed with leukoerythroblastosis is being reported.

Patient Report

A female baby of 1164 grams who was born prematurely at 29th week by cesarean section was referred to newborn intensive care unit due to prematurity and respiratory distress with no prenatal pathological findings and no significant risk factor associated with premature delivery was determined. Clinical progress and prenatal follow up of mother was normal until 28th weeks of gestation. Routine serological examinations were negative for Hepatitis B virus, Hepatitis C virus, Human immunodeficiency virus and TORCH panel. There are many maternal risk factors for preterm labor including placental dysfunction, infection, placenta previa, preeclampsia, chronic medical illness and premature rupture of membranes. These risk factors were absent in our patient. Mother had received prophylactic corticosteroid before delivery. Antenatal betamethasone treatment to induce fetal lung maturation to the mother whose premature labor had started. Physical examination revealed tachypnea and hepatosplenomegaly. Routine laboratory measurements of the newborn whose respiratory distress improved after incubator care revealed significant leukocytosis (85.000/mm³) and anemia ((Hb: 9.6 gr/dL and Hct: 27.6%). Thrombocyte count was normal. Peripheral blood smear revealed 48% neutrophils, 42% lymphocytes, 4% monocytes, 2% eosinophils, 6% nucleated erythrocytes and 4% blasts. Absolute leukocyte count was 79.900/mm³. Peripheral blood smear suggested leukoerythroblastosis with the presence of nucleated erythrocyte, monocytosis, and 4% blast cells (Figure 1,2). Reticulocyte ratio was 8.4% and absolute reticulocyte count was 320000/mm³. Hematological profile of the case was interpreted as severe leukocytosis and severe anemia for premature infants. Hemolytic anemia was ruled out because reticulocytosis was absent, direct coombs test was negative and bilirubin levels were within normal ranges. Viral infection and JMML were primarily suspected due to the detection of leukocytosis, abnormal monocytosis, nucleated erythrocytes, and blasts in peripheral blood smear. Moreover, though hepatosplenomegaly was absent, osteopetrosis was among the diseases to be ruled out. Bone marrow aspiration was performed after blood sampling for some viral serological investigations. In bone marrow aspiration, cellularity was normal, but the ratio of myeloid to erythroid precursors was 10:1, erythroid precursors were severely decreased and megakaryocytes were normal both in count and morphology while eosinophilia was detected (Figure 3). Results of TORCH panel and EBV serology were detected to be negative while parvovirus B19 Ig G and M serology was positive at the second days both in the mother and her baby. The serological diagnosis of Parvovirus B19 infection was performed by IFA method (Biotrin, Dublin, Ireland). Bone marrow cytogenetic examination was normal. Leukocyte count and peripheral smear results of the case treated with erythrocyte suspension for anemia improved to normal in 10 days, and the case did not require transfusion again. Blood transfusion was performed once until serological test results were obtained. IVIG was not administered because hemoglobin content, number of erythrocytes and reticulocytes did not decrease during follow-up and transfusion was not required again. Premature delivery and leukoerythroblastosis presentation were thought to develop secondary to intrauterine parvovirus B19 infection. Parvovirus B 19 Ig M and Ig G positivity continued at the 1st month follow up.

Discussion

Leukoerythroblastosis is a clinical manifestation observed rarely during childhood and has various etiological factors.[1,2,4] The etiological factors observed in those occurring during neonatal and early childhood period are congenital-postnatal viral infections, juvenile myelomonocytic leukemia and osteopetrosis.[1-3] As to our knowledge, no case diagnosed with leukoerythroblastosis in such an early phase is available in literature. In our case, normal findings of morphological bone marrow evaluation and cytogenetic analysis suggested lack of a malign etiology and osteopetrosis. Juvenile myelomonocytic leukemia was discarded as the leukocyte count and peripheral smear results were spontaneously regressed.[5]Some viral infections that could be common effector factors due to premature delivery were examined. Parvovirus B19 serology was detected to be positive. Presence of significant erythroid hypoplasia and anemia despite absence of typical vacuolated giant pronormoblasts seen in parvoviral infections in bone marrow support this manifestation.[5,6]

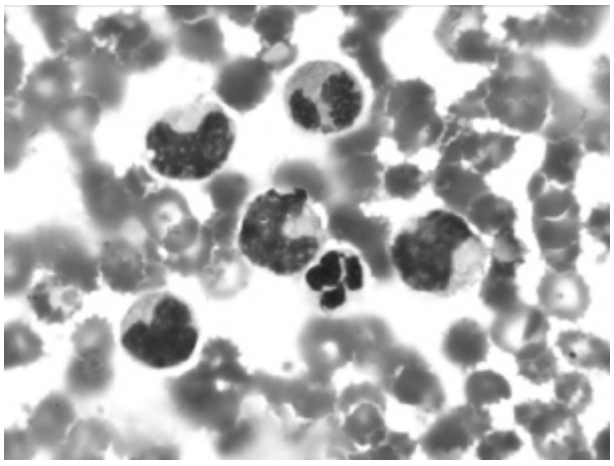

Figure 1. Significant monocytosis and myeloid cells in peripheral smear (Giemsa stain x40).

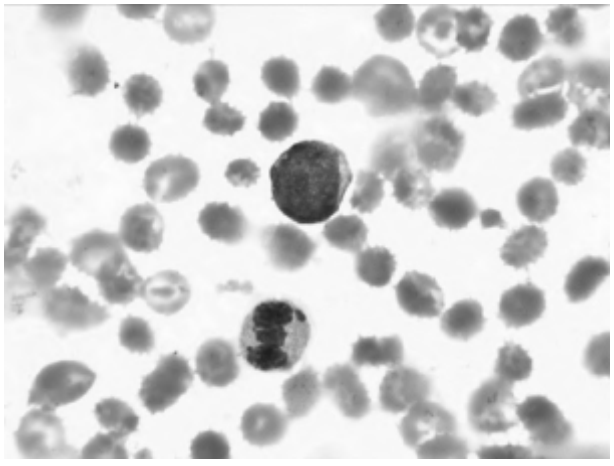

Figure 2. Blastic cell in peripheral smear (Giemsa stain x40).

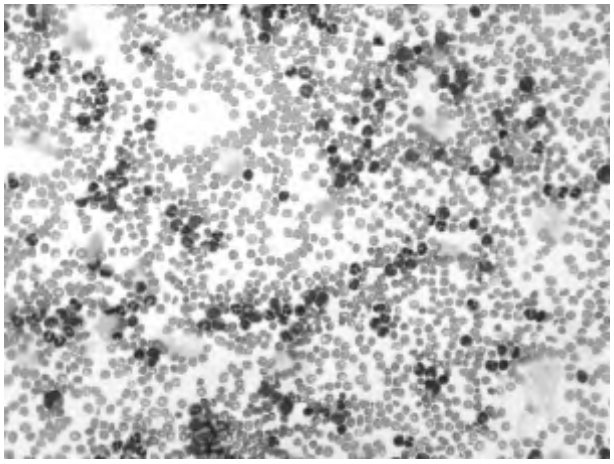

Figure 3. Significant decrease in erythroid precursors and increase in myeloid and monocytoid precursor cells in bone marrow aspiration (Giemsa stainx20).

Parvovirus B19 seropositivity is known to be commonly observed. Its ratio in 2.5 years old children is 5-10% while it is 50% in 15 years old children. Annual seroconversion rate is reported as 1.5 % in seronegative pregnant women. 20% of these are asymptomatic infections. It is reported that infections developing at 20th week of pregnancy may have a severe course, and hydrops fetalis risk is reported to be high.[7,8]

As a result, premature delivery and leukoerythroblastosis presentation was thought to develop secondary to intrauterine parvovirus B19 infection. Our case worths to be reported as leukoerythroblastosis was developed at a very early phase of life and found to be associated with parvovirus B19 infection for the first time.

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Key Words: Leukoerythroblastosis, prematurity, parvovirus B19

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