Letter to Editor

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Hematogones Masquerading as Acute Leukemia

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Hematogones are lymphoid progenitor cells and are normal constituents of bone marrow in children, which resemble malignant lymphoblast morphologically and phenotypically as both may have high nuclear: cytoplasmic ratio, condensed chromatin with no nucleoli. Sometimes, hematogones may be mistakenly reported as lymphoblasts leading onto a diagnosis of Acute Leukemia, especially if the child has pallor, fever and hepato-splenomegaly. Here, we report such a case.

A 5 month old infant was referred to our hospital with complaints of fever and cough not responding to oral medications. On physical examination, he was afebrile with pallor and occasional crackles on chest. Abdominal examination showed hepatomegaly of 2 cm with span of 6.5cm and splenomegaly of 2 cm. Rest of the clinical examination was within normal limits.

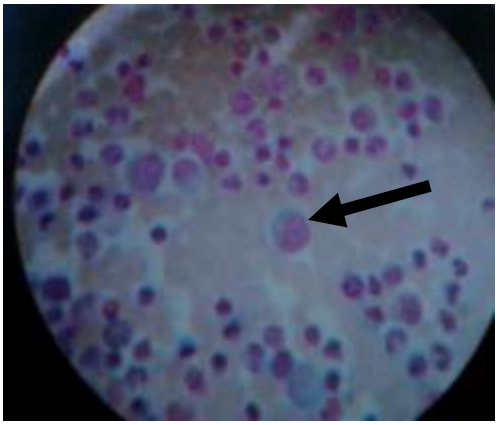

Fig 1: H&E staining of bone marrow showing hematogones masquerading as blast cells

Investigations showed haemoglobin of 5.2 gm%, total lymphocytic count of 14300/mm^3 with lymphocytic predominance, platelet count of 520000/mm^3 with ESR 140mm/hr, and positive C-reactive protein. Peripheral smear showed microcytic hypochromic anaemia with reticulocyte count of 2%. Hb-electrophoresis was within normal limits. Bone marrow study showed blasts mimicking Acute Lymphoblastic Leukemia **(Figure 1)**.

Possibility of secondaries like neuroblastoma was also entertained. For confirmation flow cytometry was done, which showed hematogones. The infant was treated with antipyretics, antibiotics, blood transfusion and hematinics and recovered well. Hemoglobin improved after blood transfusion and hepato-splenomegaly slowly disappeared. On one year follow up, he is doing fine and growing normally.

Hematogones (B lymphocyte progenitor cells) along with mature lymphocyte is a normal constituent of paediatric bone marrow (usually less than 1%). Their number decreases with age [1]. It was reported that in infants less than 2 years of age, hematogones averaged 9%, by 2 - 5 years the percent dropped to 3.9% and in patients more than 50 years of age, the average was less than 1% [2]. Concomitant anaemia and splenomegaly makes diagnosis difficult to make. In such cases immunophenotypic analysis is needed, which show immature markers in acute leukemias and mature markers in hematogones.

In flow cytometric studies, hematogones express a complete spectrum of antigen expression that defines the normal evolution of lymphocyte lineage. Depending on their stage of maturation, markers could be: CD10, CD19, CD34 positive cells, CD10, CD19 positive cells or CD19, CD22 positive ones [3]. In contrast, the ALL samples consistently express a more immature, but homogeneous, immune-phenotype, with the

majority of cases expressing TdT, CD34, or both [2].

Increased hematogones had been observed in a variety of clinical conditions like Idiopathic thrombocytopenic purpura (ITP), regenerating marrow of treated ALL, after autologous bone marrow transplantation in Acute Myeloid Leukemia (AML) and in viral infections commonly due to CMV or HIV [4-6]. These data suggest that a mechanism involving immune-stimulation of the lymphoid population probably underlies the increased proportion of lymphocytes expressing immature B phenotype. Very few cases had been described in the literature in which children had clinical picture of cytopenias with increased hematogones in the bone marrow but no probable cause could be isolated [1]. It was postulated that an unknown viral infection might be responsible for these.

In this particular child, associated infection may be the cause for whole scenario. Hemoglobin improved after blood transfusion and hepato-splenomegaly slowly disappeared. On one year follow up, he is doing fine and growing normally.

In children hematogones in bone marrow may confound the diagnosis of ALL as in this case, especially if there is associated fever, pallor and hepato-splenomegaly. Hence, before making a definite diagnosis of acute leukaemia one should be very careful, especially in infancy. Modern tests like flow cytometry comes handy in such situations.

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