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LETTER TO THE EDITOR

Sideroblastic Anemia: A Rare Cause of Childhood Microcytic Anemia

Cengiz BAYRAM[1*], [MD], Neşe YARALI[1], [MD], Ali FETTAH[1], [MD], Tekin AKSU[1], [MD], Bahattin TUNÇ[1], [MD]

1 Department of Pediatric Hematology, Ankara Children's Hematology and Oncology Hospital, Ankara, Turkey

* *Corresponding Author: Cengiz Bayram, Department of Pediatric Hematology, Ankara Children's Hematology and Oncology Hospital, Ankara, Turkey*

e-mail cengizbayram2013@gmail.com

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Dear Editor,

Herein, we present a male patient of a seven years old who had the complaints of fatigue and malaise and was referred to our clinic for further investigation of anemia. His past medical history revealed that he had been diagnosed with iron deficiency anemia four years previously, repeatedly given oral iron preperations and was not responsive. The family history was unremarkable. Physical examination was normal except for pallor. Laboratory tests revealed haemoglobin: 6.9 gr/dL, hematocrit: 22.2%, MCV: 56.4 fL, RBC: 3.94×1012/L, MCH: 17.4 pg, MCHC: 30.8 gr/dL, RDW: 30.5%, leukocytes: 7.4×109/L, platelets: 396×109/L and reticulocytes 1.1%. Peripheral blood smear revealed anisocytosis, poikilocytosis, microcytosis, hypochromia, tear drop cells, pencil cells and siderocytes (erythrocytes with pappenheimer bodies) (Figures 1 and 2). Laboratory workup for iron deficiency anemia was as following: serum ferritin:108.4 ng/mL, serum iron: 248 ug/dL, serum iron binding capacity: 260 mcg/dL and transferrin saturation index: 95%, which was inconsistent with iron deficiency anemia. Inflammatory markers including serum C-reactive protein concentration and erythrocyte sedimentation rate were normal. Direct and indirect Coombs test results were negative, lactic dehydrogenase, total bilirubin, direct bilirubin and the other serum biochemical tests were all within normal limits. Hemoglobin electrophoresis and beta globin gene sequence analyses were found as normal. In the

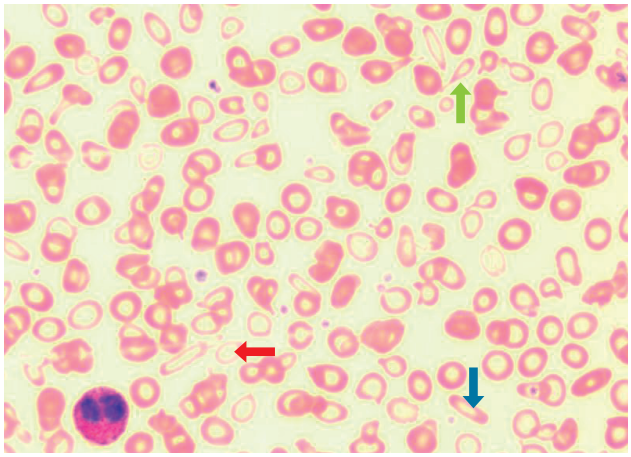

Figure 1. Peripheral blood smear showing anisocytosis, poikilocytosis, microcytosis and hypochromia (brown arrow), tear drop cells (green arrow), pencil cells (blue arrow).

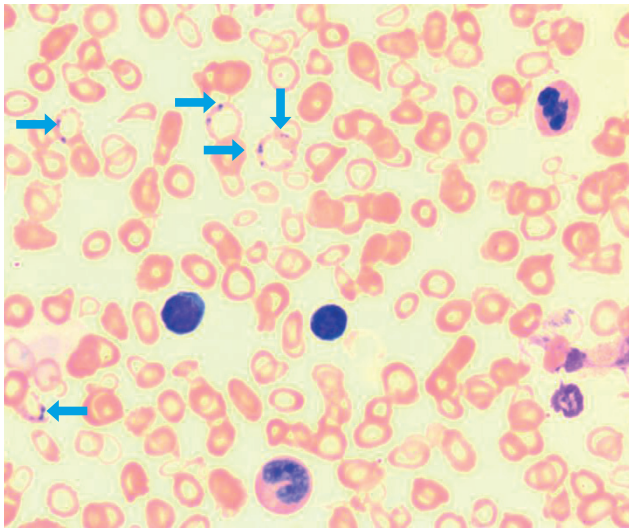

Figure 2. Peripheral blood smear showing erythrocytes with pappenheimer bodies (light blue arrow)

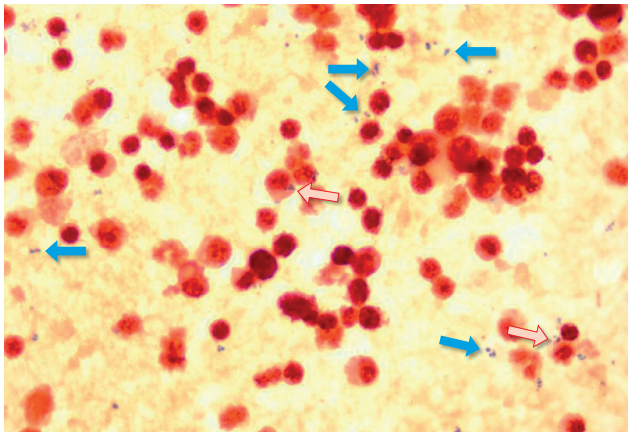

Figure 3. Bone marrow aspiration smears stained with Perl's Prussian blue stain showing numerous pappenheimer bodies (light blue arrow) and ringed sideroblasts (light pink arrow)

bone marrow aspiration smears stained with Perl's Prussian blue stain, numerous pappenheimer bodies and ringed sideroblasts were observed in the erythroid series (Figure 3). Based on patient's clinical and laboratory findings, the diagnosis of XLSA was considered and pyridoxine treatment was started. After pyridoxine initiation, hemoglobin levels gradually increased and patient's hemoglobin value was 11.1 gr/dL on the 80th day of treatment commencement. *ALAS2* gene mutation analysis revealed a variation in heterozygous state at the position 1570 of the coding nucleotide sequence of ALAS2 gene that leads to a change of aminoacid from His to Asp in position 524 of the ALAS2 protein, that was previously described as pathogenic [1].

X-linked SA is the most frequent form of congenital sideroblastic anemias and is caused by mutations in the erythroid-specific, 5′-aminolevulinate synthase gene (*ALAS2*) at Xp11.21, which encodes the first enzyme of heme biosynthetic pathway in erythroid cells [2,3].

X-linked SA is characterized by hypochromic microcytic anaemia with erythrocyte dimorphism and Pappenheimer bodies apparent on the peripheral blood smear, presence of ringed sideroblasts, especially in late erythroid precursors, in the bone marrow examination. The patients with XLSA have variable clinical response to pyridoxine treatment. Additionally the patients may develop secondary iron overload relaetd to ineffective erythropoiesis [2,4].

XLSA should be considered in the differential diagnosis of patients with microcytic anemias with elevated transferrin saturation and ferritin levels, especially after rulling out other conditions which may cause elevated ferritin levels, including inflammatory conditions and thalassemia syndromes.

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