Fanconi Aplastic Anemia Associated With β-Thalassemia Trait

To the Editor: The coexistence of two genetic defects both associated with anemia may cause some clinical and hematological abnormalities, different from those found when they are present separately. In populations with a high incidence of β-thalassemia, such as Turkey, the combination of β-thalassemia mutation and another congenital hematological disorder may occur [1–2]. In Turkey, where the incidence of Fanconi's anemia (FA) also seems high, the coexistence of β-thalassemia trait and Fanconi's anemia in a patient was not surprising [3]. Examination of this child indicated changes in some of her hematological parameters during the severe anemia period, caused by FA and during the remission period which gave us some clues about the counter effects of both abnormalities on these hematological parameters.

Case Report

A 10-year-old girl (S.K.) was referred to our unit for evaluation of severe anemia. She was the third product of a consanguineous marriage, and one of her siblings had died previously of anemia and bleeding at age 8. Her past history revealed that she was diagnosed as having patent ductus arteriosis, which was corrected at the age of 15 months. Physical examination at this hospital at the age of 10 years revealed growth retardation and mild microcephaly. Her height was 127 cm, weight 23 kg (both measurements were less that the 3rd percentile for her age), and head circumference 50 cm. She had two café-au-lait spots, and her right thumb was dislocated. The results of laboratory examination of the patient and of her parents are shown in Table I. Karyotype analysis revealed 46 chromosomes with an XX pattern; an increased rate of spontaneous, and induced chromosomal breakage by diepoxy butane (DEB) was observed. The diagnosis of FA was made, and the patient was treated with oxymethalone 2 mg/kg and prednisolone 5 mg/day. The patient responded to this therapy well in 1 year (Table I). DNA analysis of the β-gene revealed heterozygosity for the IVS1-5 G-C mutation. During the 4-year of follow-up period, the patient remained well. Oxymethalon was tapered to 0.5 mg/kg. Some of the hematological values of the patient during the follow-up period are given in Table I.

The patient presented has FA and β-thalassemia trait associated with the IVSI-5 mutation. Absence of microcytosis during the severe anemia episode caused by FA indicated that the majority of the red blood cells produced by precursor cells are of a fetal line in which Hb synthesis was probably unimpaired because of the active synthesis of the γ-chain [4]. This observation supports the previous hypothesis that fetal red cell precursors are the most resistant cell lines of the marrow precursor cells to abnormalities causing bone marrow aplasia [5]. The presence of microcytosis in remission of FA indicated that the effect of thalassemia on red cell volume overcomes the effects of FA on the same parameter. This observation conflicted with the previous knowledge that in FA during remission or before the anemic episode macrocytosis would be present. This assumption may only be valid in FA patients without a coexistent thalassemic determinant.

This study indicates the importance of detailed hematological evaluation in FA, not only in the anemic period, but during remission as well. Such a detailed study will not only help detect the presence of another genetically transmitted hematological abnormality, but will also aid in understanding the countereffects of different genetic disorders when present in a patient.

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TABLE I. Some Laboratory Data of a Patient With Fancon's Anemia and B-Thal Trait and Her Parents

	Age/ Sex	Hb (g/dl)	WBC (mm^3)	MCV (Fl)	Plat.[a] (10^9/L)	Hb A_2[b] (%)	Hb F[c] (%)
Propositus	10F	4.2	3,000	113	20	—	16
	11	12.4	5,300	68	220	3.6	7
	14	11.0	6,000	68	+++	3.7	8
Father	40M	12.0	7,800	56–61	+++	4.0–4.7	0.5–0.6
Mother	38F	12.0	6,800	87	+++	2.6	0.6

[a]+++, sufficient amount with a good clumps.
[b]By microcolumn.
[c]By alkali denaturation.

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References

1. Sayli T, Basak NA, Gumruk F, Gurgey A, Altay C: Immerslund Grasbeck syndrome coexisting with β-thalassemia trait. Pediatr Hematol Oncol 11:223–225, 1994.
2. Altay C, Gurgey A: Beta thalassemia in Turkey. Hematol Rev 6:77–81, 1992.
3. Rosatelli MC, Altay C, Oner R, Leoni GB, Moi B, Atzori G, Cao A: β-Globin haplotype and *Xmn*I polymorphism at position gG-158 and Hb F production in Fanconi's anemia. Haematologica 77:106–109, 1992.
4. Betke K, Marti HA, Schlicht I: Estimation of small percentages of foetal hemoglobin. Nature 184:1877–1878, 1959.
5. Alter BP, Knoblock ME, Weinberg RS: Erythropoiesis in Fanconi's anemia. Blood 78:602–603, 1991.