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HEMOGLOBIN KÖLN [ß 98(FG 5) VAL-MET] IN A TURKISH CHILD*

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Hemoglobin Köln (Hb Köln) is the most common unstable hemoglobin variant in the world [1-8] but has not been observed previously in Turkey. In this report we describe a Turkish child with this variant.

Case Report

A 13-year-old girl was brought to the Hacettepe Children's Hospital for evaluation of easy fatigability and passing of dark urine. The past history revealed that she had had three episodes of jaundice accompanied by pallor, fatigue and passing of dark urine.

The father had died of an unknown disease at the age of 46. The mother and six older siblings were said to be healthy. No hematological abnormalities were found in the mother or in the four siblings who were available for study.

Physical examination revealed a well developed 13-year-old girl with scleral jaundice. The spleen was palpable 3 cm below the left costal margin.

Laboratory examination. The Hb level was 12.0 g/dl, Hct 40%, and the reticulocyte count 4%. The peripheral blood smear showed polychromasia and basophilic stippling in some of the red cells. The total bilirubin in the serum was 4.4 mg/dl with a direct bilirubin of 0.8 mg/dl.

The test for red cell osmotic resistance and autohemolysis[9,10] gave normal results. Heat stability[11] was increased to 30%. The test for Heinz bodies[12] became positive after incubation of the red cells with phenylhydrazine.

Starch gel electrophoresis at pH 9.0 showed an abnormal band and a smearing in front of Hb A_2. The Hb A_2 and the normal hemoglobin were quantitated by DEAE-cellulose chromatography[13] and were present for 3.0% and 12%, respectively. The

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abnormal hemoglobin chain was isolated by PCMB precipitation and purified by CM-cellulose chromatography[13]. An abnormal βT-11 was isolated from a tryptic digest of the aminoethylated β chain using chromatographic procedures[13,14]. The composition of this fragment was Asp 2.18 (2)*, Glu 1.35 (1), Pro 1.07 (1), Val 0 (1), Met 0.63 (0), Leu 1.09 (1), Phe 0.95 (1), His 1.11 (1), Lys 1.0 (1). These results indicate a Val-Met substitution at position β98, as observed in Hb Köln.

Discussion

After the first description of hemoglobin Köln in 1962 in a German family, more than 60 cases have been reported throughout the world[1-8,15-20]. Hemoglobin Köln is inherited as an autosomal dominant trait. In many instances the unstable hemoglobin is reported to be a new mutation. The absence of Hb Köln in four of six siblings and in the mother may suggest a similar situation in our family, but the father and two additional siblings unfortunately could not be examined.

Two other unstable hemoglobin variants have been observed in Turkey. One was Hb Istanbul [β93 (F8) Gis-Gln] and the other Hb Moabit [β86 (F7) Leu-Arg][21,22]. In both instances hemolysis was more pronounced than observed in the patient with Hb Köln. Since hemolysis is mild, it is possible that patients with Hb Köln may not be recognized easily. The presence of recurrent episodes of jaundice together with passing of dark urine in a patient should make physicians suspicious concerning the presence of an unstable hemoglobin. The use of stability tests will greatly aid in the diagnosis of unstable hemoglobin disease.

Summary

A thirteen-year-old girl with recurrent acute hemolytic episodes due to Hb Köln is presented. Hemoglobin Köln, the most common unstable hemoglobin in the world, has not been reported from Turkey previously.

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* Values in parentheses refer to the numbers of residues in the T-11 peptide from Hb A.

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