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CASE REPORT

First observation of Hb D-Ouled Rabah [beta19(B1)Asn>Lys] in the Turkish population

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ABSTRACT

Hb D-Ouled Rabah [beta19(B1)Asn>Lys] is a rare hemoglobin (Hb) beta chain variant reported from Tuareg tribes in Algeria and once from China. It was suggested that Hb D-Ouled Rabah might be specific of Berber-speaking populations. Our report describes the first observation of this hemoglobin variant in the Turkish population.

Key words: Hemoglobinopathy, Hb D-Ouled Rabah, abnormal hemoglobin

ÖZET

Türk toplumunda gözlenen ilk Hb D-Ouled Rabah [beta19(B1) Asn>Lys] olgusu

Hb D-Ouled Rabah [beta19(B1)Asn>Lys] Cezayirdeki Tuareg kabilelerinde bildirilen nadir bir hemoglobin varyantıdır. Her ne kadar Çin'de de bir olgu bildirilmiş olsa dab u hemoglobin varyantının sadece Berberce konuşan toplumlarda bulunabileceği konusunda bir görüş bulunmaktadır. Bu çalışmada Hb D-Ouled Rabah [beta19(B1)Asn>Lys] Türkiye'de ilk kez bildirilmektedir.

Anahtar kelimeler: Hemoglobinopati, Hb D-Ouled Rabah, anormal hemoglobin

INTRODUCTION

Hb D-Ouled Rabah [beta19(B1)Asn>Lys] is a rare hemoglobin (Hb) beta chain variant reported from Tuareg tribes in Algeria and once from China [1-3]. It was suggested that Hb D-Ouled Rabah might be specific of Berber-speaking populations [4]. To date, more than 50 Hb variants have been identified in the Turkish population [5]. Premarital screening has been conducted in the Denizli province of Turkey by the Turkish Ministry of Health Hemoglobinopathy Center since 1995. Here we report the first Hb D-Ouled Rabah case observed in the Turkish population detected during the premarital screening program in the Denizli province of Turkey.

CASE REPORT

This study reports observation of the heterozygous Hb D-Ouled Rabah [beta19(B1)Asn>Lys] in a 32-year-old male living in Denizli province, located in the Aegean region of Turkey. This Hb variant was detected during the premarital screening program. Written informed consent was obtained for the laboratory tests and DNA analysis from the propositus. Hb electrophoresis at alkaline and acid pH, DE-52 column chromatography and non-radioactive fluorescence dye-based DNA sequencing (BECKMAN Coulter CEQ8000, USA) were performed as previously published [6]. Blood samples were collected in EDTA vacutainers under the hemoglobinopathy control program conducted by the Turkish Ministry of Health Denizli Hemoglobinopathy Center. High performance liquid chromatography (HPLC) results were obtained with BioRad Variant II system, USA. DNA was isolated from the individuals by standard phenol-chloroform extraction method. Analysis of the red blood cell parameters were as follows: Hb 16.3 g/dl, RBC 5.48 10^6/mm^3, Hct 47.9%, MCV 87.0 fL, MCH 29.7 pg, MCHC 34.0 g/dl, and RDW 12.3%. Hb variant shows an abnormal hemoglobin peak at Hb A2 window with retention time of 3.69 min as shown in Figure 1. Hb variant has Hb S-like bands at alkaline pH and Hb A-like bands at acidic pH. In DE-52 microcolumn chromatography, Hb variant is eluted with Hb S buffer. Hemoglobin composition was 1.6% Hb A2, 40.1% Hb X and 58.3% Hb A determined by DE-52 microcolumn chromatography. DNA sequencing revealed the Hb variant as a missense mutation at codon 19 (AAC>AAA) as shown in Figure 2.

DISCUSSION

To the best of our knowledge, our heterozygous Hb D-Ouled Rabah [beta19(B1)Asn>Lys] case is the first to be reported in the Turkish population. Although Merghoub *et al.* [4] suggested that the Hb variant Hb D-Ouled Rabah might be specific of Berber-speaking populations in Africa, the Chinese case [3] and our case could change this hypothesis. To be able to prove this hypothesis, the genetic background of all these cases should be identified at the molecular level, including beta globin gene cluster haplotypes. In our province, as in other centers in Turkey, premarital screening is being applied by routine blood cell count and HPLC method.

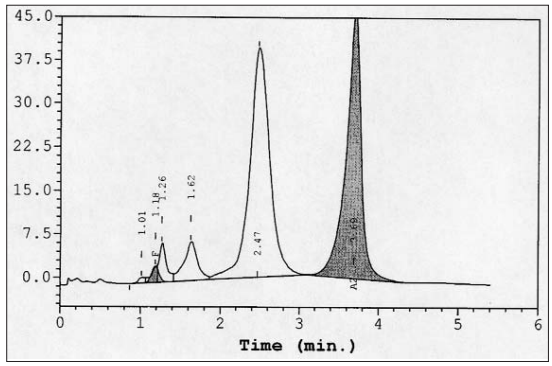

Figure 1. HPLC profile of the Hb variant Hb D-Ouled Rabah

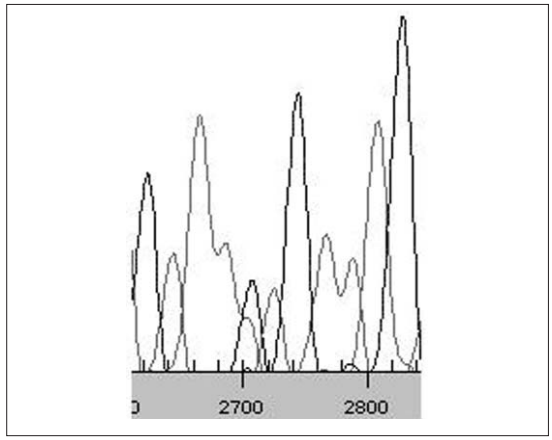

Figure 2. DNA sequencing of the Hb AX (AAM> M: A/C)

In premarital screening programs, the nature of any variant hemoglobin detected by HPLC that is of potential clinical relevance should be confirmed by alternative techniques [7]. Hb D-Ouled Rabah is detected in Hb A2 area in HPLC and presents Hb D-like electrophoretic behavior as Hb S-like at alkaline and Hb A-like at acid pH. In case of the use of DE-52 microcolumn chromatography, this Hb variant is eluted with Hb buffer. In conclusion, Hb D-like variants pose many problems in premarital identification. This problem increases especially in regions like Denizli province, in which Hb D-like Hb variants, Hb D-Los Angeles, Hb G-Coushatta and Hb Beograd are frequently observed [8,9]. DNA sequencing is of major importance in the confirmation of the mutation observed both in premarital and prenatal molecular diagnosis, especially for regions like Denizli province of Turkey. The establishment of a national registry system is an important issue in the field of hemoglobin research in Turkey [5,6,10]. Considering the presence of different well-equipped research groups in Turkey, research networking (including the Turkish Ministry of Health Hemoglobinopathy Centers and University laboratories) should also be considered an important issue on a national basis. As previously proposed by Akar *et al.* [10], the national registry system and research network can be achieved under the auspices of the Turkish Hematology Association.

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