Prevalence of hemoglobinopathies in premarriage individuals referred to Babolsar, Iran (2006-09)

Valizadeh F (MD)¹, Mousavi A (BSc)², Hashemi-Soteh MB (PhD)³

¹Genetic Counselor, Babolsar Health Center, Deputy of Health, Mazandaran University of Medical Sciences, Babolsar, Iran. ²Manager of non-communicable disease, Babolsar Health Center, Deputy of Health, Mazandaran University of Medical Sciences, Babolsar, Iran. ³Assistant Professor, Molecular and Cell Biology Research Center, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.

Abstract

Background and Objective: According to world health organization statistics, at least 5.2% of world population is carrier for a main hemoglobin disorder. Previous reports showed that more than 10% of people are carrier for beta-thalassemia Northern Iran. This study was done to determine the prevalence of hemoglobinopathies in premarriage individuals referred to Babolsar, Iran.

Materials and Methods: This descriptive study was carried out on 8500 individuals (4200 women and 4300 men) whom were attended the thalassemia counseling program in Babolsar, North of Iran during 2006-09. After performing the CBC test, for those MCV and MCH were less than 80 and 27 respectively, Hemoglobin A2 was evaluated. Subjects whom were volunteers for more comprehensive tests, basic and acidic electrophoresis and genetic tests were applied, subsequently.

Results: 1200 (14.11%) subjects had low hematological indexes. 474 (5.57%) subjects had high HbA2 and were classified as beta-thalassemia carriers and 726 (8.54%) had normal HbA2 level and were classified as alpha-thalassemia carriers. 6 (1.2%) subjects were identified with HbF level more than 10 and were identified as carriers for beta-gene cluster deletion carrier. Also, 16 (3.2%) individuals had HbE, 16 (3.2%) had HbS, 4 had HbD and 4 had HbH (0.33% in 1200 and 0.047% in 8500 subjects). Genetic study of 317 individuals for beta carriers and 145 subjects for alpha-carriers showed IVSII-1G>A (74.5%) in beta-globin and single gene deletion of 3.7 (47.5%) in alpha-globin genes were the most frequent mutations.

Conclusion: This study showed that carriers for alpha - thalassemia (8.5%) are more frequent compared with beta- thalassemia (5.57%). Also other hemoglobin variants included HbS, HbE, HbD or different beta-gene cluster deletions in the region are considerable and should be screened.

Keywords: Hemoglobin Variant, Alpha-thalassemia, Beta-thalassemia, Sickle cell anemia, Thalassemia prevalence, Beta gene deletion

* Corresponding Author: Hashemi-Soteh MB (PhD), E-mail: hashemisoteh@gmail.com

Received 20 February 2011    Revised 16 October 2011    Accepted 9 November 2011