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Incidence of heterozygous carriers of haemoglobinopathies among immigrants in Northern Greece

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Abstract. The aim of this study was to detect the haemoglobinopathy-carrier rate among immigrants screened in the Thalassaemia Prevention Unit of Hippokratio Hospital of Thessaloniki. During 1993-2000, 27.466 adult subjects were tested for haemoglobinopathies; at that time the political changes that occurred into the Balkans and ex-USSR caused a great wave of immigrants to Greece. The total number of the screened immigrants was 2106 (7,6% of the screened population). Nine hundred twenty-seven (44%) were people of Greek origin, coming from Albania and ex-USSR. Eighty hundred four (38%) were Albanians and migrants from ex-USSR. Other minority groups such as Armenians, Cypriots, Bulgarians, Serbians, immigrants from central Europe, Asia and Latin America, consisted 18% of the total. The thalassaemia carrier rate was found as 13,3% among Greeks who lived in Albania, 4,9% among native Albanians, 3,4% among Armenians, 2% among Georgians, while no carriers were found among Russians. The results indicate the emerging need of a public policy concerning the prevention of these hereditary disorders among immigrants that live in our country.

Key words: thalassemia trait • immigrants • screening • hemoglobinopathies

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INTRODUCTION

Thalassaemia syndromes are due to mutations of the α- or β-globin genes that decrease or prevent the production of α- or β-globin chains and are the most common single-gene disorders in the world. Greece is highly affected with an 8% incidence rate among citizens, with heterogeneous distribution over the entire country[1-3]. The national screening program for Thalassaemia and other haemoglobinopathies prevention started in 1974 and has been successful as since the incidence of thalassaemia major births has dramatically decreased. From 1993 towards the political changes that occurred at the Balkans and ex-USSR caused a great wave of immigration in all the 15 Member states of the European Union[4]. Due to the increasing number of immigrants, the prevention of these disorders among members of these communities, is a new reality. Immigrants in Greece approximate 1.000.000 but there is still a high number of foreigners who avoid registration. The aim of this study was to determine the prevalence of heterozygous carriers of thalassaemic syndromes among immigrants voluntarily examined by free of charge screening, ignoring origin, religion and registration status. The results indicate that there is an emerging need of a public policy concerning the prevention of these hereditary disorders among immigrants who live in this country.

MATERIAL-METHODS

The carrier identification was carried out by a standard scheme which is followed by all 21 "Units of Prevention" of Greece[3].

Peripheral-blood counts and red cell indices (RBC, Hb, Ht, MCV, MCH, MCHC, RDW) were determined with the use of a Coulter Onyx. Haemoglobin electrophoresis was carried out with H.P.L.C. (Bio-Rad, Variant β-thalassaemia Short Program). Haemoglobin A2 was also quantified by column microchromatography (Hb A2 Helena Lab.). Haemoglobin H inclusion bodies were detected by incubating the peripheral blood for 30 min with methyl violet at 37° C. Agar electroploresis plates were also used for the study of various haemoglobin fractions at pH 8,4 and 6,4 (Helena's kit). Serum ferritin levels were measured by micro-Elisa technique (Abbot Lab.).

RESULTS

From the 27.466 adult subjects who underwent screening, 2106 (7,6%) were immigrants. Their ethnic origin and the distribution of thalassaemic traits among various ethnic groups is shown in Tables 1 and 2.

β thalassaemia trait was the most common haemoglobinopathy among immigrants (72,24%), while HbS, HbD, HPFH, HbC, HbE were also detected in this population. The highest rates of haemoglobinopathies was found among native Greeks who lived in South Albania also known as North Epirus (13,3%). The incidence of thalassaemia trait among Greeks from ex-USSR was found as (3,57%). Immigrants from Balkans showed a variety of incidence rates. Thalassaemia carriers from Bulgaria arised to 10,5%, from Albania 4,9%, from former Yugoslavia 4,7%.

As for other ethnic groups, 3,4% of Armenians were carriers and 2% of Georgians while no carriers were found among Russians.

Discussion

Thalassaemia syndromes widely affect the Mediterranean populations and represent for Greece a public health problem of great importance[1,3]. The distribution of β-thalassaemia carriers is heterogeneous, varying from 5% to 20% in some regions all over the country. However since 1974 a national program for the prevention of thalassaemia and other haemoglobinopathies is running and includes sensitisation of the public, screening and identification of carriers, genetic counselling and prenatal diagnosis[1-3].

Since 1993, political changes and civil crises resulted in a great number of immigrants moving to our country as Greece represents an easy step to get into the developed countries. For many of these ethnic groups, the frequency of globin gene mutations measures in their countries is known[5-9]. An emerge need for taking public policy for the immigrants arises, as their majority comes from Albania and the Balkans at least in Northern Greece. There also exists a tendency to get married within the same community, they are of

Table 1.

Ethnic origin	No	Non-carriers	β-thal	α-thal	δβ-thal	HbS	HbD	HPFH	HbC	HbE
Albania	488	464	21	1	-	1	1	-	-	-
Greeks natives in South Albania	284	245	30	1	2	3	1	2	-	-
Greeks from Pontos	643	620	18	3	1	1	-	-	-	-
Georgia	197	193	4	-	-	-	-	-	-	-
Russia	119	119	-	-	-	-	-	-	-	-
Armenia	88	85	2	1	-	-	-	-	-	-
Central Europe	71	67	-	2	-	1	-	-	-	1
Cyprus	51	34	16	1	-	-	-	-	-	-
Bulgaria	38	34	3	1	-	-	-	-	-	-
Romania	28	28	-	-	-	-	-	-	-	-
Serbia	21	20	-	1	-	-	-	-	-	-
Africa	52	45	1	-	-	5	-	-	1	-
Asia	16	13	1	2	-	-	-	-	-	-
Latin America	10	8	1	-	-	1	-	-	-	-

Table 2.

Ethnic origin	No	Non-carriers %	Carriers %
Albania	488	95,0	4,9
Greeks natives in South Albania	284	86,7	13,3
Greeks from Pontos	643	96,4	3,57
Georgia	197	97,9	2,0
Russia	119	100,0	0,0
Armenia	88	96,5	3,4
Central Europe	71	94,3	5,6
Cyprus	51	65,3	34,6
Bulgaria	38	89,4	10,5
Romania	28	100,0	0,0
Serbia	21	95,3	4,7
Africa	52	86,5	13,5
Asia	16	81,25	18,7
Latin America	10	80,0	20,0

young age and have a higher birth rate in comparison to Greeks.

For this purpose, a programme of this population screening and counselling should be discussed. One must have in mind that thalassaemia will be a major health problem all over Europe because of the demographical changes. The interference of ethical and religious beliefs[4,10] must be also considered as well.

Our results give only an idea of the problem as all immigrants are not officially registered and so incidences are not precise. We believe that a suitable program requires an educational campaign for teachers at schools, obstetricians, general doctors, midwives, nurses. Furthermore, the use of information booklets in both Greek and foreign languages may be of great help. A community-based screening program can be feasible and with potential benefits for people at risk and could include adult voluntary testing and newborn screening as well[11,12].

There are many practical problems but undoubtfouly the birth of healthy infants must be a major aim in the new millennium for the society.

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