



BLOOD-GROUP ABO AND RHESUS FACTOR SYSTEMS DISTRIBUTION IN INDIVIDUALS OF VIETNAMESE NATIONALITY

Velislav Todorov, Maria Boycheva, Cvetan Minkov, Volodia Georgiev*,
Milen Boichev****

*SOFIA UNIVERSITY, FACULTY OF BIOLOGY, DEPARTMENT OF ZOOLOGY AND
ANTHROPOLOGY, *DEPARTMENT OF GENETICS, 8 DRAGAN TZANKOV STR., SOFIA,
BULGARIA*

***KONSTANTIN PRES LAVSKY UNIVERSITY OF SHUMEN, FACULTY OF NATURAL
SCIENCE, DEPARTMENT OF BIOLOGY, 115 UNIVERSITETSKA STR, SHUMEN,
BULGARIA*

ABSTRACT: *The article reports the results of a study of blood group ABO and Rhesus factor systems conducted on 423 Vietnamese citizens (104 men and 319 women) aged 19 to 77 who lived or are currently living in Bulgaria. The frequency of the individual groups of the ABO system is: 0 - 49,88%, B - 25,06%, A - 21,75%, AB - 3,31%, and the gene frequency - $r = 0,711$, $q = 0,155$, $p = 0.134$. Only subsets A1 and A1B were detected in the ABO system. There was only Rh in the studied population.*

KEY WORDS: *blood groups ABO and Rhesus factor, phenotype, genetic frequency, individuals of Vietnamese nationality*

INTRODUCTION: Determining blood group distribution is of great importance for defining anthropological characteristics of a people. Vietnam, whose nationals we have researched, is located in Indochina Peninsula, along with Cambodia, Laos, Malaysia, and Thailand. Most of Myanmar (Burma) and small parts of Bangladesh and China also belong to the peninsula (Figure 1). The peoples of these countries who belong to the mongoloid race, are characterised with a very low or completely absent negative Rhesus factor and 0 blood group prevalence - from 34.49% in Malaysia to 47.98% in China, and 48% in Cambodia [1, 2]. According to other sources, group 0 membership ranges from 21 to 55% [3,4].

Aim of the study: To research ABO blood group and rhesus factor distribution in individuals of Vietnamese nationality.

Material and methods: The study involved 423 people (104 men and 319 women) aged 19 to 77. The tests were conducted in Sofia using standard test sera. The study data were compared to those of other nationalities, calculating the phenotypic and genotypic frequencies [5].



Figure 1. Countries located wholly or partly on the territory of the Indochina Peninsula (Bangladesh is not shown)

Results and discussion:

The data of the study are presented in table 1 and 2.

Table 1. Distribution of blood groups by the AB0 and Rhesus factor systems in Vietnamese

Groups	0	B	A ₁	A ₁ B	Rh+	Rh-
Number tested	211	106	92	14	423	0
%	49,88	25,06	21,75	3,31	100,00	0

Table 2. Genotypic frequency of ABO system blood groups in Vietnamese

r	q	p
0,711	0,155	0,134

The analysis of the obtained data shows a prevalence of 0 blood group frequency (49.88%), followed by group B (25.06%) and group A (21.75%). The lowest is the frequency of group AB (3.31%) - see Table 1. The results are very similar to those obtained by Kicheva [6] - 46.94% for group 0, 29.89% for group B and 20.78% for group A. According to another source [1] the distribution in groups is: 0 - 42%, A - 22%, B - 31% and AB - 5%. The theoretical frequencies for AB0 blood group are as follows: for group 0 - $r = 0.711$, for group B - $q = 0.155$ and for group A - $p = 0.134$. Blood groups A and AB are represented only by subgroup A₁ and A₁B. The subgroup A₂ is hardly found in the indigenous people of China, East Asia (Korea, Japan) and Australia, [5]. All studied individuals have a positive Rhesus factor that fully matches Kicheva's data [6].

When comparing the obtained results with the data for the peoples living in this region, we found a greater similarity of phenotypic frequency to that of the Chinese and the Filipinos [3] was the closest, and a significant difference with Koreans and Laoists [3]. The main population of the peninsula are the Malaysians and small tribes of Negritos (Semagi), who have interbred with Chinese and Indian people (Chinese in Vietnam, and Indians in Cambodia).

The Mongoloid and Australoid populations of East Asia, Oceania and Australia differ significantly from the Euro-west population of West Asia, North Africa and Europe [7,8]. The East Asian and Central Asian distribution of AB0 was formed in the Neolithic period [9]. According to F. Berstein (1925 year), historically group B is predominant in Asia, while according to F. Sander and

M. Sander (1951 year) it is group AB [3]. The Hirschfeld hypothesis [3] accepts 0 group as the oldest predecessor to the other groups, which preserves its high frequency in the oldest population of Indochina Peninsula. This fact can correlate with the higher frequency of blood group 0 in Vietnamese, as mentioned by a number of authors [6,3]. In general, in the population of Indochina peninsula r gene is predominant, with the northern part being dominated by rqp, and the southern, by rpq [7]. Blood group 0 predominates in the local Australoid population as well, which confirms the hypothesis about the formation of the peninsula's indigenous population [3].

The frequency of the positive Rhesus factor in the Pacific ocean countries (including Oceania, Eastern and Southeast Asia) is over 80%, whereas in Africa it is 70-80%, and in Western Europe up to 60%. The very high frequency of the positive Rhesus factor is which is characteristic of most Pacific ocean countries, irrespective of the fact whether the population is of Mongoloid or Australoid origin, to the extent of forming a separate South-Eastern group including the Pacific population [3].

The study has identified some characteristic features of the blood group distribution among the studied individuals of Vietnamese origin, namely the presence of only two subgroups - A1 and A1B and a complete absence of a negative Rhesus factor. This fact makes us conclude that these people belong to the fifth group in William Boyd's classification [3,10,11].

Conclusions: Based on our studies of individuals of Vietnamese nationality, we can draw the following conclusions:

1. The distribution of AB0 system groups is: 0 - 49,88%, B - 25,06%, A - 21,75% and AB - 3,31%.
2. All persons examined are Rhesus positive.
3. Subgroups A2 and A2B are not detected.
4. In their blood-grouping characteristics, the Vietnamese can be assigned to the fifth group of peoples of William Boyd's classification.

References:

- [1]. [http://wiki2.org/en/Blood type distribution by country](http://wiki2.org/en/Blood%20type%20distribution%20by%20country)
- [2]. [http:// bloodtypes.jigsy.com/East_Asia-bloodtype](http://bloodtypes.jigsy.com/East_Asia-bloodtype)
- [3]. Popvasilev, I., H. Bliznakov. Blood group systems in humans. Meditsina i fizkultura, Sofia, 1980, 57-69.

- [4]. Todorov, V., G. Bozikova, M. Kicheva. Blood groups belonging to AB0 and Rhesus systems of two ethnic groups, First national conference of Anthropology with international participation, 1991, 183-185.
- [5]. Nakov, L., B. Botev. Frequency of genes and Gene types. Hardy-Weinberg's law. Meditsinska genetika, Meditsina i fizkultura, Sofia, 1976, 206-209.
- [6]. Kicheva, M. Comparative seroanthropological studies of Greek, Jewish and Vietnamese people. Diploma paper, Sofia University St. Kliment Ohridsky, 1991, 12-22.
- [7]. Cheboksarov, N.N. Ethnic anthropology of China. Nauka, Moscow, 1982, 152-156, 215-220, 225-229.
- [8]. Todorov, V., M. Rubljova. Karakteristika krvnih grupa grka I armenaca. Posebno izdanje antropoloskog drusrva Jugoslavije, 1987, sv. 9, 111-116.
- [9]. Roginskiy, N. Y., M. G. Levin. Anthropology, Visshaya shkola, Moscow, 1978, 361-365.
- [10]. Boyd, W. C. Genetics and the Races of Man: an Introduction to Modern Physical Anthropology, Little, Brown and Company, 1950.
- [11]. Boyd, W. C., I. Asimov. Races and People, Abelard-Schuman, 1955.

The present study is conducted with the financial help of Project No PД-08-125/06.02.2017, fund "Scientific studies" of Konstantin Preslavsky University of Shumen.