

## BLOOD-GROUP CHARACTERISTICS OF THE CONTEMPORARY BULGARIAN POPULATION FROM MIDDLE MIZIA

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### Abstract

In this investigation we studied the blood group affiliation of the Bulgarian population from Middle Mizia according to the ABO systems and Rhesus factor in connection with the complicated ethnos of the Bulgarians. The sample comprised 769 individuals of both sexes. The defined distribution of the groups from the ABO system was established in the studied population. The comparison with a control group from the Bulgarian population was made. The following differences were established – a decreased presence of the blood group A and an increasing of the blood group B and of the blood group AB. The differences by the blood group A are significant. There are no differences by the Rhesus factor.

According to the group from Troyan, however, the data shows a presence of a mongoloid admixture. A significant decreasing of the blood group A was observed and weak presence of the negative Resus factor.

**Key words:** Blood-group systems, ABO, Rhesus factor, Middle Mizia

### Introduction

The investigation of the blood group system is of big meaning for building up of fuller anthropological characteristic of a given population. Such attitude and Markovich (1994). Similar investigations in our country take up a particular place because of the complex ethnos of the Bulgarian people. In the investigations, carried out in our country up to now, the systems ABO and Rhesus factor are traced above all. The published results, up to now, of these investigations can be divided into of four groups by themes (subjects):

1. Regional investigations – at these examinations search eventual differences in the distribution of the separate groups (Todorov i sar. 1996,1997; Todorov et al. 2009; Minkov i sar. 2004).

2. A tie between the blood group belonging and the illness ( predisposition for the appearance and this development (Vizev i sar. 1986; Timceva i sar. 1998-1999, 2001; Todorov i sar. 2003, 2004, 2008, 2009, 2010; Максимова и сътр. 2008-2009; Maksimova i sar. 1997, 2002, 2006, 2007).

3. In ethnical aspect – an investigation of the blood group belonging at the ethnos, that inhabit our country (Todorov, Rubljova, 1986; Todorov i sar. 1993, 1998, 1998-1999; Todorov et al. 1983, 1991, 2005 ).

4. A studying of these traits in connection with the duration of the life (Todorov 1981, 1998-1999).

## Material and methods

In this investigation are studied 769 individuals (382 men and 437 women) from the following towns of Middle Mizia – Veliko Tarnovo, Gorna Oriachovitsa and Troyan. It was traced a blood group belonging of the systems ABO and Rhesus factor. In this study are used standard tests of serums. For this purpose the study was accomplished according to the cross method. It was accomplished a comparison of the received results with these one of the control group from the Bulgarian population. (1080 persons). It was realized by means of T-criterion according to formula offered from (Markovich, 1985). The results are presented on table 1-4.

## Results

Blood group system ABO. The received results are presented in table 1. At the examined excerpt was established the next distribution of the groups from the system: O group – 31,99%, A group – 32,12%, B group – 23,15% and AB group – 12,74%. It was established the characteristic for Bulgarians arrangement of the separate groups A, O, B, AB. At comparison of the indexes of the relative share by means of T-criterion, accomplished with control group, was established a bigger frequency of the cases with B group (23,15% to 18,04%), a little higher frequency at group AB (12,74% to 7,59%) and practically the some values at O group (31,99% to 31,67%). It is obvious the smaller frequency of the persons with A group toward this one at the control group (31,12% to 43,70%). The established difference is statistically significant ( $T=3,04$ ,  $p<0,01$ ).

**Table 1.** A frequency of the blood groups in the population from Middle Mizia and from the control group

**Tabela 1.** Distribucija krvnih grupa sisteme ABO na uzorku Srednje Mizije i kontrole

grupa	N/%	O	A	B	AB
Srednja Mizija n=769	N	246	247	178	98
	%	31.09	31.12	23.15	12.74
Kontrola n=1080	N	342	472	184	62
	%	31.67	43.70	18.04	7.59

**Table 2.** A frequency of the blood groups and Rh factor in the population from Troyan

**Tabela 2.** Distribucija krvnih grupa sistemima ABO i Rezus faktora na uzorku iz Trojana

grupa	N/%	O	A	B	AB	Rh <sup>+</sup>	Rh <sup>-</sup>
Srednja Mizija n=769	N	71	35	65	29	182	18
	%	35.59	17.50	34.50	12.50	91.00	9.00
Kontrola n=1080	N	342	472	184	82	916	164
	%	31.67	43.70	18.04	7.59	84.81	15.19

At the processing of the collected material make an impression, that the excerpt from Troyan distinguish considerably according to the examined traits from the rest group of Middle Mizia. The results are presented in table 2. From this table we can see the biggest concentration of O group – 35,50%, follows a group B – 34,50%, group A – 17,50%, and group AB – 12,50%. It is outlined a increased representation of B group (with 16,44%)

some increasing of O and AB groups (respectively with 3,83% and 4,91%). The decreasing of the percentage at the persons with A group is significant (with 28,20%,  $T=3,09$ ,  $p<0,01$ ).

The differences between the whole embraced contingent and the control are established and at comparison of their gene frequency. Particularly big is the difference at gene “p”, more little at “r” and the most little at “q”.

**Table 3.** Gen frequency of the population in the studied groups

**Tabela 3.** Distribucija gena kod obuhvaćenih grupa

grupa	p	q	r
Srednja Mizija	0.430	0.185	0.385
Trojan	0.164	0.256	0.580

Blood group system Resus factor. The results are presented in table 4. At the studied contingent is established a frequency of positive Rhesus factor of 84,65%, and of the negative – 15,35%. At comparison with the control group were established identically values (respectively 84,65% and 84,81% and 15,35% and 15,19%). At the excerpt from town Trojan are established a significant increasing of the positive Rhesus factor (91,00% -  $t=2,35$ ,  $p<0,02$ ).

**Table 4.** A frequency of Rh factor the population from Middle Mizija and from the control group

**Tabela 4.** Distribucija krvnih grupa sistema Rezus faktora na uzorku iz Srednje Mizije i kontrole

grupa	N/%	Rh <sup>+</sup>	Rh <sup>-</sup>
Srednja Mizija n=769	N	651	118
	%	84.65	15.35
Kontrola n=1080	N	916	164
	%	84.81	15.19

## Discussion

The results of the distribution of the blood groups from the system ABO at the examined contingent distinguishes from the normal distribution of the traits at the Bulgarians as a whole. It makes an impression the considerable increasing of the percentage frequency of the group B. This phenomenon together with some increasing at AB and a significant decreasing of the percentages at group A, give us a reason to suppose, that in the Bulgarian ethnos from this region, are taken part and “eastern” elements. A special attention must pay to the group from Trojan. The arrangement of the separate groups (A, B, O, AB) distinguishes as from this one of the most Balcan populations, so and of the Bulgarians, generally. The big percentage at group B, the weak representation of group A and of the negative Rhesus factor shows, that in this region outline a presence of considerable “eastern” admixtures.

Our conclusion for a presence of “eastern” admixtures confirms and from more early led odontological investigations in the region of Trojan. (Minkov T, 1976) establishes an increased percentage frequency of shovel-shaped upper medial incisors (33%) in the studied population from this region. This is an indication for a presence of “eastern” admixture in

the ethnoses of the studied population. It is known that at the europoid population the percentage of the shovel-shapedness of the incisors is in the limits between 12.5 and 15%.

## Conclusion

1. The studied population by the blood group traits characterize like a europoid population, but with a presence of "eastern" elements in its ethnoses.

2. The excerpt from the region of Troyan distinguishes with considerably "eastern" admixture by the studied traits, that confirm as historical and other investigation in this region.

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## **KRVNO-GRUPNE KARAKTERISTIKE SAVREMENOG BUGARSKOG STANOVNIŠTVA SREDNJE MIZIJE**

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### **Sažetak**

Istraživana je krvno-grupna pripadnost stanovništva Srednje Mizije sistemima ABO i Rezus faktor u vezi sa složenom etnogenezom Bugara. Obuhvaćeno je 769 lica oba pola. Pri poređenju sa podacima bugarskih populacija konstatuje se manja zastupljenost A grupe, očigledno veća kod B grupe i veća kod AB u Srednjoj Miziji. Značajne su razlike kod A grupe ( $p < 0,01$ ). Kod Rezus faktora ne nalazimo razlike. U uzorku iz Trojana konstatuju ce značajno smanjenje distribucije A grupe i mala zastupljenost negativnog Rezus faktora.

**Ključne reči:** Krvno-grupni sistemi, ABO, Rezus faktor, Srednja Mizija