

ABO and Rh Blood Groups Distribution in Yozgat City, Turkey

Yozgat İlinde ABO ve Rh Kan Gruplarının Sıklığı

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ABSTRACT

Objective: In this retrospective study, we included 5257 healthy participants who admitted to Yozgat Government Hospital Blood Bank and Bozok University Blood Bank for several reasons to determine A, B, O, AB blood groups and Rhesus (Rh) positivity ratios between January 2007 and April 2013.

Methods: We recorded their blood group types, age and gender from the hospital data. 2430 females, 2827 males totally 5257 participants were included to our study.

Results: 2330 (44.3%) persons were A blood group, 837 (15.9%) were B group, 1665 (31.7%) were O and 425 (%8.1) were AB group. Rh positivity ratio of our study group was 88%. Blood group frequency of Yozgat city is similar to other cities and the general population of our country, Turkey.

Conclusion: Knowing the blood group is important for the blood recruitment in our region. *J Clin Exp Invest* 2014; 5 (2): 169-172

Key words: Blood bank, ABO Blood group system, Yozgat, Turkey

ÖZET

Amaç: Çalışmamızda 2007-2013 yılları arasında Yozgat Devlet Hastanesi Kan Bankası ve Bozok Üniversitesi Tıp Fakültesi Kan Bankası'na çeşitli nedenlerle başvuran ve kan grubu testi yapılan 5257 sağlıklı kişinin sonuçları değerlendirilerek Yozgat ilinin A, B, O, AB kan grubu dağılımını ve Rhesus (Rh) pozitivite oranını belirlemeyi amaçladık.

Yöntemler: Kişilerin kan grubu sonuçları, yaş ve cinsiyetlerine hastane bilgi işlem sistemi üzerinden ulaşıldı. 2430 kadın, 2827 erkek toplam 5257 kişi çalışmaya dahil edildi.

Bulgular: 2330 (%44,3) kişi A kan grubu, 837 (%15,9) kişi B grubu, 1665 (%31,7) kişi O grubu ve 425 (%8,1) kişi AB grubu idi. Çalışma grubumuzun Rh pozitivite oranı %88 idi. Yozgat ilindeki kan gruplarının dağılımı ülkemiz geneli ve iller düzeyinde benzerdir.

Sonuç: Bölgemizin kan grubu profilinin belirlenmesi kan temini konusunda yol gösterici olacaktır.

Anahtar kelimeler: Kan bankası, ABO Kan grubu sistemi, Yozgat, Türkiye

INTRODUCTION

The first definition of ABO blood group antigens by Landsteiner, is one of the most important step for safety blood transfusion. So many structures in blood cell related with cell membrane has antigenic properties which may pose antibody response has been shown. Today, number of serologically defined blood group antigens are more than 600. Most of these antigens are related to each other and they constitute the blood group system. There are 29 blood group systems approved by International Society of Blood Transfusion (ISBT) in 2004 [1]. Clinically,

the most important point is the definition of antigens in ABO blood group system [2].

ABO system antigens exist on surface of erythrocytes and thrombocytes as membran antigens, in vascular epithelium cells, in intestinal/cervical/mammary gland epithelium cells and also soluble in plasma, saliva, milk, urine and feces. Reactive antibodies against antigens which are not on erythrocyte surface constitutes another property of this system. These two characters provide ABO system to be the most important antigen of transfusion and transplantation. Additionally it is the only one blood

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group system letting reverse grouping according to determination of these antibodies in plasma principal [3]. Rhesus (Rh) system is important for transfusion medicine, too [2]. %85 of the humans agglutinated the antiserum obtained from rabbits due to giving erythrocytes of *Macacus Rhesus* monkeys. And this antigen has been called as Rh antigen. After that, it has been understood that, it is the D antigen which has the highest antigenity property following A and B antigens. In the Rh system, the most powerful antigen is D antigen, so erythrocytes agglutinated with anti-D are called as Rh positive, erythrocytes which are not agglutinated with anti-D are called as Rh negative. [3].

Knowing the blood group distribution of a city would be helpful for blood bank workers and people who need blood. Up to day, no data has been reported for blood group frequency of our city, Yozgat. In this study, we aimed to determine the distribution of ABO and Rh groups of people living in Yozgat and to provide data in this situation.

METHODS

In this retrospective study, we included 5257 participants who admitted to Yozgat Government Hospital Blood Bank and Bozok University Blood Bank for several reasons to determine blood group between January 2007 and April 2013. We recorded their blood group types, age and gender from the hospital data. ABO and Rh blood groups had been determined by using lam agglutination, tube agglutination and gelly agglutination methods. STATA 11.0 (College station, Texas, USA) program was used for

statistical evaluation. Data was considered with percentage calculation.

RESULTS

2430 females, 2827 males totally 5257 healthy participants were included to our study. We divided the study group into eight subgroups according to age. 204 participants were under the age of 10, 377 were between 10-19, 1002 between 20-29, 874 were between 30-39, 780 were between 40-49, 699 were between 50-59, 601 were between 60-69 and 720 were over 70. 2330 (44.3%) persons were A blood group, 837 (15.9%) were B group, 1665 (31.7%) were O and 425 (8.1%) were AB group [Figure 1]. Blood group distribution of our study group according to gender is given in figure 2. Detailed blood group distribution according to age and Rh is given in table 1. Rh positivity ratio of our study group was %88.

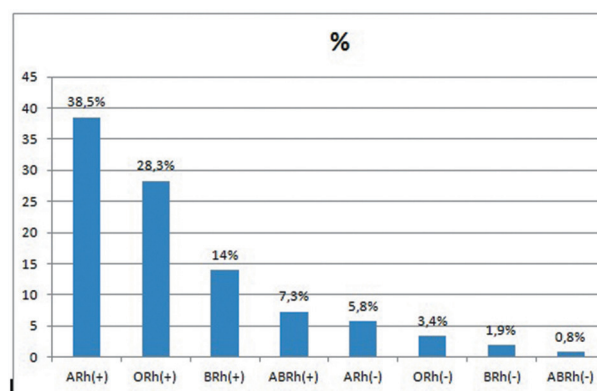


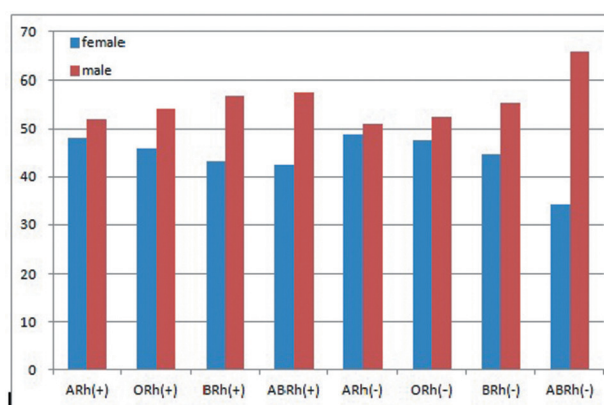
Figure 1. Blood group distribution of our study group

Table 1. Blood group distribution of our study group [n ()]%.

Age, yrs	Blood groups								Total
	0 Rh+	0 Rh-	A Rh+	A Rh-	B Rh+	B Rh-	AB Rh+	AB Rh-	
0-9	55 (27)	6 (2.9)	81 (39.7)	13 (6.4)	27 (13.2)	3 (1.5)	17 (8.3)	2 (1)	204 (100)
10-19	117 (31)	11 (2.9)	152 (40.3)	19 (5)	43 (11.4)	10 (2.7)	19 (5)	6 (1.6)	377 (100)
20-29	303 (30.2)	32 (3.2)	349 (34.8)	64 (6.4)	153 (15.3)	18 (1.8)	75 (7.5)	8 (0.8)	1002 (100)
30-39	234 (26.8)	30 (3.4)	340 (38.9)	58 (6.6)	126 (14.4)	13 (1.5)	66 (7.6)	7 (0.8)	874 (100)
40-49	225 (28.9)	27 (3.5)	302 (38.7)	47 (6)	84 (10.8)	24 (3.1)	67 (8.6)	4 (0.5)	780 (100)
50-59	190 (27.2)	32 (4.6)	286 (40.9)	27 (3.9)	93 (13.3)	16 (2.3)	47 (6.7)	8 (1.1)	699 (100)
60-69	171 (28.5)	18 (3)	232 (38.6)	45 (7.5)	78 (13)	12 (2)	42 (7)	3 (0.5)	601 (100)
>70	191 (26.5)	23 (3.2)	281 (39)	34 (4.7)	132 (18.3)	5 (0.7)	48 (6.7)	6 (0.8)	720 (100)
Total	1486 (28.3)	179 (3.4)	2023 (38.5)	307 (5.8)	736 (14)	101 (1.9)	381 (7.3)	44 (0.8)	5257 (100)

Table 2. ABO and Rh blood groups Distribution in Turkey and in Some Cities in Turkey

City	Group A (%)	Group O (%)	Group B (%)	Group AB (%)	Rh (+) (%)	Rh (-) (%)
Rize ⁸	44.07	44.07	9.26	2.60	83.70	16.30
Denizli ⁹	42.60	33.30	16.80	7.40	89.90	10.10
Van ¹⁰	43.80	30.80	16.20	9.20	86.80	13.20
Diyarbakır ¹¹	40.81	33.66	18.53	6.98	89.17	10.82
Malatya ¹²	39.32	41.28	13.36	6.04	89.00	11.00
Gaziantep ¹³	40.01	35.09	18.10	6.80	90.83	9.17
Konya ¹⁴	45.06	32.21	15.63	7.12	87.40	12.60
Ankara ⁷	44.62	32.24	15.45	7.69	88.13	11.87
İstanbul ¹⁵	44.80	30.80	15.90	8.10	87.20	12.80
Eskişehir ¹⁶	43.52	31.10	16.84	8.50	86.65	13.35
Edirne ¹⁷	46.55	30.93	15.99	6.53	87.79	12.21
Şanlıurfa ¹⁸	36.38	34.69	21.25	7.68	90.79	9.21
Yozgat (our study)	44.30	31.70	15.90	8.1	88.00	12.00

**Figure 2.** Blood group distribution of our study group according to gender

DISCUSSION

ABO and Rh blood group profile varies due to ethnicity and folk [4]. The gene coding the ABO groups are posed on the 1st and the 9th chromosome [5]. A, B, O, AB group ratios all over the world are, consecutively: 41%, 9%, 47%, 3% [4]. In the United States of America (USA) A, O, B and AB blood group distribution ratios were reported as 37.1%, 47.7%, 12.2%, 4.1 % and Rh positivity ratio was 85.4 % [6]. In general population of Turkey frequency of blood groups are: A (42.84%), O (32.67%), B(16,46%), AB (8.03%) and Rh positivity ratio was 88.54 % [7]. Blood group frequencies of other cities of Turkey are given in Table 2.

This is the first study on distribution of blood groups in Yozgat City. The results of our study were similar to general of our country.

A, B, AB, O and Rh blood group frequencies of some cities of Turkey is given in Table 2.

In our study, ratios of Rh (+) and Rh (-) individuals are found to be 83.70% and 16.30% respectively. According to table 2, Eskişehir, Konya and Ankara are the closest cities to Yozgat according to blood group distribution. Our Rh positivity ratio was 88 %. According to Rh positivity Eskişehir is the closest city to Yozgat with a percentage of 87.79.

In conclusion, blood group frequency of Yozgat city is similar to other cities and the general population of our country, Turkey. Knowing the blood group is important for the blood recruitment in our region. This first data about blood group frequency of Yozgat city would contribute to the literature and would be helpful in transfusion practice.

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