

Prevalence and Distribution of ABO and Rh (D) Factor among Blood Donors in Sabratha-Libya

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Abstract

There are differences in the distributions of AB and Rh(D) blood groups amongst different populations. The present investigation was undertaken with the aim to study ABO blood group frequency amongst a blood donors in Sabratha city - Libya. The data for ABO blood group were collected from register of Central Blood Bank, Sabratha-Libya during a period of six months (January to June 2019). A total of 5356 donor were included in the study. The frequency of blood group O (43.19%) was found to be the highest, followed by blood group A (34%), B (18.13%) and AB (4.68%). The results also indicated that (83.53%) of donors were Rh positive and (16.47%) were Rh negative. The study may give preliminary idea about blood group frequency distribution among the population of Sabratha.

Keywords: Sebratha, Blood donors, ABO, Rh factor.

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INTRODUCTION

The ABO blood group system was the first human blood group system to be discovered by Karl Landsteiner in 1900. Forty years later the Rh blood group system was discovered. The ABO blood grouping is based on the antigens on the surface of red blood cells [1]. There are four types: A, B, AB and O in the ABO system and Rh-positive and Rh-negative using the rhesus system [2].

Identifying blood group is very important in the effective management of blood banks and in blood transfusion services to minimize major transfusion reactions [3-9]. In addition to the importance of these blood groups, there are several reports in which some associations have been found between ABO and Rhesus blood group systems and certain diseases [10].

During the last four decades, numerous of studies were conducted to determine the frequency of ABO and Rhesus blood groups with diverging phenotypic results across various populations in different geographical regions. Till date, only very few of the studies have been conducted to understand the distribution of ABO blood group frequency among the population of north-western of Libya.

The present study was carried out to determine the prevalence of ABO and Rhesus blood groups in blood donor in Sabratha-Libya and to compare our results with other studies conducted in Libya and elsewhere in the world.

MATERIAL & METHODS

Subjects

This study was carried out on 5356 blood donors who were attending Central Blood Bank, Sabratha-Libya during a period of six months from January to June 2019, to determine the distribution of the ABO and Rh blood groups. All participants were males and their age ranged between 18 and 65 years.

Determination of Blood Groups

The ABO blood group data of 5356 individuals were collected from the recorded data of Central Blood Bank, Sabratha-Libya. Moreover, the blood samples were collected by venepuncture and emptied into tubes containing ethylene diamine tetra acetic acid (EDTA) as an anticoagulant. ABO and Rh-D grouping were carried out by agglutination test using commercially available antisera A, B and Rh (D). In doubtful cases, the prepared samples were observed microscopically. In the case of the Rh negative result, the indirect test was performed to confirm the result.

Statistical Analysis

Statistical analysis was performed with the help of SPSS software, Version 22. The frequency of each A,B,AB,O and Rh+, Rh- blood group was calculated by direct count and later converted into percentage. Results were compared with similar group prevalence studies from neighboring and world countries.

RESULTS

In the present study, blood group O (43.19%) was found to be the highest among the studied

population followed by blood group A (34%), B (18.13%) and AB (4.68%). The frequency was in the order of O > A > B > AB as shown in Table-1 and Figure-1. The results also indicated that (83.53%) of donors were Rh positive and (16.47%) were Rh negative (Figure-2). Moreover, the distribution of ABO Rh positive blood groups was as follows, blood group O⁺(33.96%), A⁺(29.39%), B⁺(16.21%) and AB⁺(3.98%) the most common being blood group O⁺. Among total (16.47%) Rh negative blood groups O⁻(9.22%) was most common followed by A⁻(4.61%), B⁻(1.92%) and AB⁻(0.71%) Table-2 and Figure-3.

Table-1: Prevalence of ABO blood groups in blood donors

Blood Group	A		B		AB		O		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
	1821	34	971	18.13	251	4.68	2313	43.19	5356	100

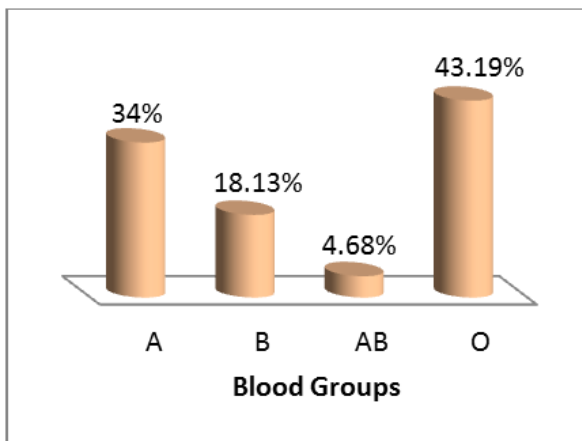


Fig-1: Distribution of ABO blood groups in blood donors

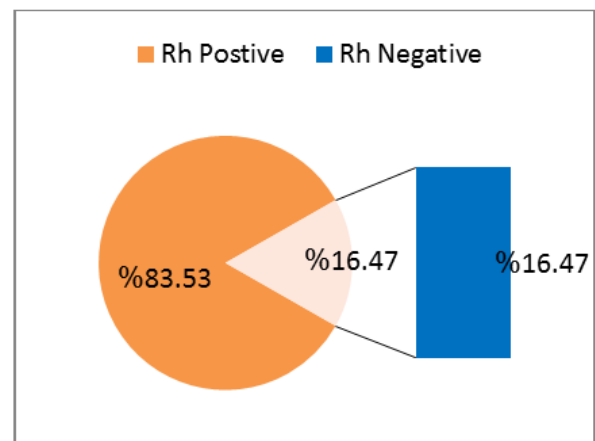


Fig-2: Distribution of (Rh) blood groups in blood donors

Table-2: Rh (D) positive and negative of ABO Blood groups in blood donors

Blood Group	A+	A-	B+	B-	AB+	AB-	O+	O-	Total
No.	1574	247	868	103	213	38	1819	494	5356
%	29.39	4.61	16.21	1.92	3.98	0.71	33.96	9.22	100%

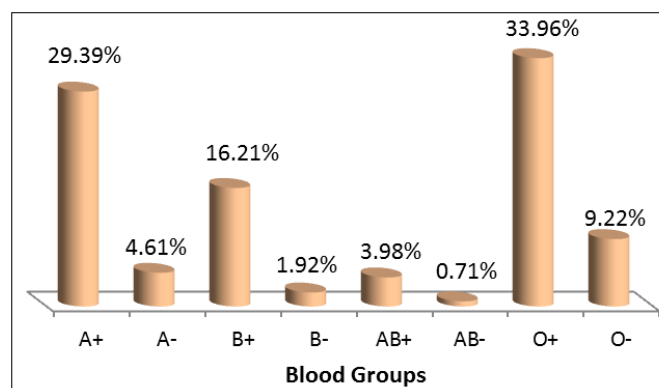


Fig-3: Rh (D) positive and negative of ABO Blood groups in blood donors

DISCUSSION

The present study provides information on the status of ABO and Rh-D blood group distribution in population of north-western of Libya. In our study, blood group O (43.19%) was the most prevalent,

followed by groups A (34%), B (18.13%) and AB (4.68%). The study of ABO frequency in Libya [11] found that the percentage of blood group O is the highest, followed by A,B and AB which is similar to frequency in our study. Moreover, Our finding is

observed in neighboring countries and other parts of the world and the different results is also observed as shown in Table-3.

A majority of people in the world have the Rh (D) positive blood group. In this study, the Rh (D)

positive and negative blood groups were found to be 83.53% and 16.47% respectively which similar to previous studies in Libya and different regions of the world as presented in Table-3.

Table-3: Comparison of frequency percentages of ABO and Rh groups of Sabratha with neighboring countries and different geographical areas in Libya and the world

Location	Author(s)	Blood group				Resus Factor	
		A%	B%	AB%	O%	Rh+%	Rh-%
Libya (Sebratha)	Present study	34	18.13	4.68	43.19	83.53	16.47
Libya (Albyda)	(Kawakeb, 2016) [11]	30.17	23.43	8.96	37.44	83.92	16.08
Tunisia	(Hmida <i>et al.</i> , 1994) [12]	30.94	17.83	5	46.18	90.81	9.19
Morocco	(Hafid <i>et al.</i> , 2016) [13]	31.47	15.15	4.35	49.01	89.86	10.13
Saudi Arabia	(Bashwari <i>et al.</i> , 2001) [14]	24	17	4	52	93	7
Nigeria	(Falusi <i>et al.</i> , 2000) [15]	21.6	21.4	2.8	54.2	95.2	4.8
Guinia	(Loua <i>et al.</i> , 2007) [16]	22.5	23.7	4.7	48.9	95.9	4.1
Iran	(Zahara <i>et al.</i> , 2014) [17]	34.2	16.2	7.0	33.7	91.1	8.9
India (Sikkim)	(Jayanti R. & Bisu S., 2017) [18]	35.34	21.99	7.49	35.18	99.47	0.53
India (West Bengal)	(Sah and Sahadalal, 2016) [19]	13.31	36.52	10.15	31.27	99.97	0.03
India (Chattisgarh)	(Shrivastava <i>et al.</i> , 2015) [20]	22.17	35.42	8.17	33.55	96.85	3.15
Macedonia	(Kostovski <i>et al.</i> , 2014) [21]	34.45	15.66	10.29	28.85	89.26	10.74

CONCLUSION

The present study is the first comprehensive study that documents the frequencies of ABO in Sabratha city which is located in north-western of Libya. Among the various ABO blood groups, group O is the commonest; followed by A and B while AB is the least common group. Further research with particular focus on the association of ABO/Rh blood groups and some diseases in this population is highly recommended.

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