



FREQUENCIES OF ABO BLOOD GROUPS AND RHESUS ANTIGENS AMONG SUDANESE DONORS IN KHARTOUM STATE

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ABSTRACT

Background: Blood groups are genetically determined and exhibit polymorphism in different populations. ABO and Rh blood groups are useful in population genetic studies, researching population migration patterns, as well as resolving certain medico-legal issues. **Objective:** The purpose of this study was to determine the Frequencies of ABO blood groups and Rh antigens among Sudanese Donors in Khartoum State. **Materials and Methods:** One Thousand samples were included in this study to determine the Frequency of ABO blood group and Rh phenotype among Sudanese Donors. ABO and Rhesus typing were carried out using monoclonal grouping anti-sera. **Results:** The results found that among 1000 Sudanese participants, 334 (33.4%) were A blood group, 149 (14.9%) were B blood group, 511 (51.1%) were O blood group and 6 (0.6%) were AB blood group. The Rhesus blood group was positive in 970 (97%) and negative in 3 (3%) among the study population. The frequency of RhC, Rhc, RhE and Rhe antigen were 299 (29.9%), 959 (95.5%), 146 (14.6%) and 978 (97.8%) respectively. **Conclusion:** The findings indicate that the 'O' was the most common ABO blood group and RhD, Rhc and Rhe are highly prevalent among the study population.

KEYWORDS: ABO Blood groups, Rh phenotypes, Sudan.

INTRODUCTION

Blood groups are genetically determined and exhibit polymorphism in different populations. A total of 30 human blood group systems are now recognized by the International Society of Blood Transfusion.^[1] In clinical practice, ABO and Rh blood groups are the most important among the 30 blood groups.^[2]

The Rh system is one of the most polymorphic of the human blood groups. More than 40 different antigens have been identified; five are commonly and known as D, C, c, E and e. The Rh is genetically complex but it is simply described in terms of a single pair of alleles, D and d. Rh positive (Rh+) persons are DD and Dd, and Rh negative (Rh-) are dd. The Rh blood groups rank with ABO groups in clinical importance because of their relation to hemolytic disease of the newborn (HDN) and their importance in blood transfusion.^[3]

ABO and RhD grouping along with cross matching by Anti Human Globulin (AHG) technique is a mandatory requirement for safe transfusions. The Rh system currently is composed of 49 antigens expressed by the genes on chromosome.^[4] The important antigens of Rh system are: RhD, RhC, RhE, Rhc and Rhe. Even after

proper blood grouping and cross matching there is a possibility of alloimmunization and antibody production in the recipients against the Rh or minor blood group antigens like Kell, MNSs, Duffy etc. Some countries have made extensive phenotyping and complete cross matching compulsory for the category of patients who may require multiple transfusions in future.^[5]

Apart from their importance in blood transfusion practice, the ABO and Rh blood groups are useful in population genetic studies, researching population migration patterns, as well as resolving certain medico-legal issues, particularly of disputed parentage.^[6] The purpose of this study was to determine the Frequency of ABO blood group and Rh antigens among Sudanese Donors in Khartoum State.

MATERIALS AND METHODS

This study was a cross sectional study, conducted in Khartoum, Sudan. 1000 samples were included in this study to determine the frequency of ABO blood groups and Rh antigens among Sudanese donors in Khartoum State. Three ml of blood was collected from each subject in an EDTA container for the determination of blood grouping. This study was approved by ethical committee

of ministry of health, and informed consent was obtained from each participant before sample collection.

ABO and Rh blood typing was carried out using monoclonal grouping anti-sera (anti A, anti B, Anti D, Anti C, Anti E, Anti c and Anti e) By standard tube method (direct and indirect method for ABO blood grouping and direct method for Rh phenotyping). Statistical analysis was performed using statistical package for social science (SPSS) software.

RESULTS

The results showed that the blood groups among 1000 Sudanese participants were 334 (33.4%) for A blood group, 149 (14.9%) for B blood group, 511 (51.1%) for O blood group and 6 (0.6%) for AB blood group (table 1).

Table 1: Frequency of ABO blood groups.

ABO	Frequency	Percent's
A	334	33.4
B	149	14.9
O	511	51.1
AB	6	0.6
Total	1000	100.0

The O blood group show highest frequency among study group 511 (51.1%), While AB was the least frequency with frequency 6 (0.6%).

Table 2: Frequency of Rhesus antigens.

	Frequency	Percent's
RhD	970	97
RhC	299	29.9
Rhc`	959	95.5
RhE	146	14.6
Rhe`	978	97.8

The Rhesus blood group showed positive in 970 (97%) and negative in 3 (3%) among study population.

The frequency of RhC, Rhc`, RhE and Rhe` antigen were 299 (29.9%), 959 (95.5%), 146 (14.6%) and 978 (97.8%) respectively (table 2).

DISCUSSION

This is a cross sectional study conducted in Sudan, Khartoum. Our results showed that the blood groups among 1000 Sudanese participants were 334 (33.4%) for A blood group, 149 (14.9%) for B blood group, 511 (51.1%) for O blood group and 6 (0.6%) for AB blood group with a RhD positive in 970 (97%) and negative in 3 (3%) among study population. Several studies have been carried out to determine the frequency of 'ABO' and 'Rh' blood group antigens and phenotypes among the Sudanese ethnic groups. Our study agrees with study done in Sudan in Elmanaseer tribe by Amged G^[7] who found that the 'O' blood group was the most common blood group among the study group, followed by 'B', 'A' and the least blood group was 'AB'. Another study was done by Nahid M. A^[8] in Elshokria Sudanese tribe. It was observed that the most common antigen was 'O'

antigen followed by 'A' antigen, 'B' and 'AB'. The percentage of positive-negative 'Rh' antigen was as (96%) positive and (4%) negative.^[9] This study also gone in a same direction with our study. RhD, Rhc and Rhe antigens were the most frequent in the study group, while RhC, and RhE antigens were reported as lower frequencies.

Knowledge of the frequencies of the different blood groups in Sudan is very important for Blood Banks and transfusion service policies. Knowledge of blood group phenotype distribution is also important for clinical studies (for example disease association), as well as for population studies.

CONCLUSION

The findings indicate that the 'O' is the most common ABO blood group and RhD, Rhc and Rhe are highly prevalent among the study population.

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