

## ORIGINAL ARTICLE

## ABO and Rh typing of Blood Donors Attached to Government Hospital Blood Bank ,Vadodara

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### ABSTRACT

**BACKGROUND:** Since it was discovered by Karl Landsteiner, the ABO blood group system is the most important blood group system in Transfusion Medicine. The blood group systems are also very important in population genetic studies, researching population migration patterns as well as resolving return medico-legal issues, particularly disputed parentage. **OBJECTIVE:** Retrospective study was carried out with an objective to provide data regarding frequency and distribution of ABO and Rh blood groups among blood donors attached to government hospital blood bank in baroda. **MATERIALS AND METHODS:** Data of 29750 blood donors were retrospectively collected and analyzed regarding ABO and Rh blood groups from Jan 2014 to June 2016 and reported in simple numbers and percentage. Blood group of the blood donors was determined by forward and reverse methods with the help of commercially available standard monoclonal antisera by Test Tube and column agglutination techniques in requires cases. **RESULT:** The most common blood group among donors was B (35.02%) followed by O (33.10%), A (22.96%) while the least prevalent blood group was AB (8.92%). Rh positive among donors was 96.02% rest were Rh negative (3.98%). **CONCLUSION:** In our blood bank attached to government hospital baroda has seen B Positive as most common blood group among the blood donors.

**Key Words:** ABO typing, Rh typing, blood donors.

### INTRODUCTION

The ABO blood group system was the first human blood group system to be discovered by Landsteiner in 1901, Later Landsteiner and Wiener defined the Rh blood group in 1941. Together these two systems have proved to be the most important, for blood transfusion purposes.

Discovery of ABO blood group system opened the way for discoveries in the field of immunohaematology, blood transfusion among humans irrespective of their natives, unmatched pregnancy, legal medicine, anthropology and the discovery of other blood group systems.

The ABO blood group system is divided into four blood types on the basis of presence or absence of A and B surface Antigens. The blood groups are A,B,O and AB. ABO blood group system is important

because of the fact that A and B are strongly antigenic and anti A and anti B are naturally occurring antibodies present in the serum of persons lacking the corresponding antigen. These antibodies are capable of producing intravascular hemolysis in case of incompatible transfusion.

Knowledge of availability of different Blood groups at various levels is need of the hour for more efficient delivery of blood bank services and so is the need of this study.

### AIMS & OBJECTIVES

This study is aimed to determine the distribution pattern of the ABO and Rh blood groups among blood donors attached to government hospital blood bank , Vadodara and compare it with other data from similar studies within India .

### MATERIALS AND METHODS

The present retrospective study was carried out at SSG Hospital blood bank attached to government medical college , Vadodara. The data of present study corresponds to period january 2014 to july 2016. The donors were first required to fill up a registration form which carried all the

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information like personal details, demographic details, occupation and medical history. Haemoglobin estimation was performed and donors with haemoglobin less than 12.5 gm% were not selected. The donors were then screened by medical officer according to blood donor selection criteria and guidelines from drug and cosmetics act and NACO. Individuals with good health, mentally alert, physically fit were selected as blood donors. The donors were then asked to sign the donor questionnaire and informed consent form.

Total 29,750 donors were considered medically fit and accepted for blood donation. After blood donation, ABO and Rh typing was done by antigen antibody agglutination test by commercially available standard antisera i.e. anti A, anti B and Anti D after validation at blood bank. Blood groups were done by conventional tube technique. All weak D groups were considered as Rh positive. Data on frequency of ABO and Rh blood groups were reported in simple percentages.

**RESULTS**

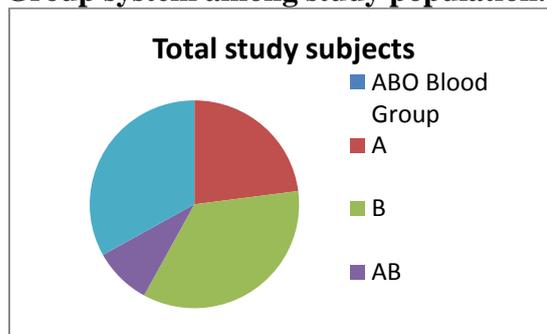
Blood grouping of 29750 donors was done. The most common blood group was B (35.02%) and the least common was AB (8.92%). B blood group was followed by O (33.10%) and A (22.96%). (Table-1, Fig-1).

Rh (D) positive was 96.02% and Rh (D) negative was 3.98% (Table-1).

**Table 1: Frequency of ABO and Rh Blood Group Systems.**

Blood groups	Total subjects	study Prevalence (In %)
<b>ABO Blood Group</b>		
A	6831	22.96
B	10419	35.02
AB	2654	8.92
O	9846	33.10
<b>Rh (D) Blood Group</b>		
Rh Positive	28566	96.02
Rh Negative	1184	3.98

**Figure 1: Distribution of ABO Blood Group system among study population.**



**Table 2: Comparison of frequency percentage of ABO and Rh (D) Blood Group in different areas of India.**

Donor Population	A(in %)	B(in %)	AB(in %)	O(in %)	Rh Positive (in %)	Rh Negative (in %)
Lucknow	21.73	39.84	9.33	29.10	95.71	4.29
Punjab	21.91	37.56	9.30	31.21	97.30	2.70
Jodhpur	22.20	36.40	9.40	31.70	91.75	8.25
Ahmedabad	23.30	35.50	8.80	32.50	94.20	5.80
Surat	24.10	34.89	8.69	32.33	94.18	5.82
Maharashtra	23.38	31.89	8.72	30.99	95.36	4.64
Durgapur	23.90	33.60	7.70	34.80	94.70	5.20
Banglore	23.85	29.95	6.37	39.82	94.20	5.80
Vellore	21.86	32.69	6.70	38.75	94.50	5.50
Present study	22.96	35.02	8.92	33.10	96.02	3.98

**DISCUSSION**

The study of distribution of blood groups is important as it plays a vital role

In blood transfusion, organ transplantation, genetic research, human evolution, forensic pathology and some groups have shown association with diseases like duodenal ulcer, Rh and ABO incompatibility of newborn etc.

We compare our results with other studies carried out in different geographical areas of the country. The studies done in Eastern part of India , Durgapur by Nag et al and in Southern part of India by Periyavan et al at Banglore , Das PK Nair at Vellore , found the commonest blood group was O ; followed by B , A and AB (Table-2).

Our study shows the commonest blood group as B , followed by O, A and AB. The studies done in northern part of India by Chandra et al at Lucknow, Sindhu et al at Punjab and Behra et al at Jodhpur shows blood group B was the commonest followed by O, A and AB. In western part of India like Ahmedabad by Wadwa MK et al, studies done at Surat by Nidhi et al and Giri et al at Maharashtra showed blood

group B as the commonest followed by O, A and AB.

The same prevalence was found in our study that is blood group B was more frequent than O followed by A and AB.(Table-2)

The incidence of Rh (D) Positive blood group in most part of the India varies from 92% to 98% and 2% to 8% were Rh (D) Negative. The present study results are within this range. (Table-2)

### **CONCLUSION**

The B blood group is significantly high in our population and comparatively low AB blood group. Every transfusion centre should have a record of frequency of blood group system in there donor population. It helps in inventory management. Knowledge of blood group distribution is also important for clinical studies , for reliable geographical information in the population.

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