ORIGINAL RESEARCH PAPER

Volume-9 | Issue-5 | May-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

# PREVALENCE OF ABO AND RH-D BLOOD GROUPS AMONG BLOOD DONORS OF MAGADH REGION

Pathology

**Dr.Vijay Sagar** Tutor, Department of Pathology &Transfusion Medicine, Anugrah Narayan Magadh Medical College, Gaya.

**Dr. Asim Mishra*** Associate Professor Department of Pathology, A-6, TutorsBuilding, Anugrah Narayan Magadh Medical College, Gaya. *Corresponding Author

## ABSTRACT

The distribution of ABO and Rhesus (Rh) - D blood groups varies from one population to another. The ABO and Rh blood groups play an integral role in blood transfusion service. We carried out this study with the aim of determining the distribution of ABO and Rh blood groups among blood donors. This would also help in the planning of the ever increasing demand for safe blood and blood products.

## KEYWORDS

Abo Groups, Blood Transfusion, Rhesus Groups

## INTRODUCTION

The ABO blood group system is used to denote the presence of one, both, or neither of the A and B antigens on erythrocytes.[1] In human blood transfusions it is the most important of the 36 different blood type (or group) classification systems currently recognized. The aim of any blood transfusion to the patient is that it should be beneficial to the patient. This is possible when we provide the patient with donor red cells that optimally survive after transfusion and serve their function.[2] The distribution of ABO and Rh blood groups is important for the effective management of blood banks.[3] The ABO blood group system was the first human blood group system discovered by Landsteiner in 1900.[4] The ABO blood group system is the only system in which antibodies are constantly present in the serum of human beings whose red cells lack the antigens. Depending on whether Rh antigen is present on red cells or not, Rh phenotype is classified as Rh - D positive and Rh-D negative. The Rh (D) antigens have greater immunogenicity than all other red cell antigens except A and B antigens. Transfusion of ABO-incompatible blood can be associated with acute intravascular hemolysis, renal failure and death. So in the blood bank, every blood donation is screened for ABO and Rhesus factor. This study was conducted with the aim of determining the distribution of ABO and Rhesus blood groups among blood donors.

## MATERIALS AND METHODS

This was a retrospective study conducted over a period of 6 months. Venous blood was collected in EDTA and plain clean vacutainer tubes and allowed to clot naturally at room temperature. The ABO blood Grouping and Rhesus typing were determined by tube method. Forward grouping was carried out using monoclonal anti- sera; anti-A, anti-B, anti-AB, and anti-D (Eryclone, tulip diagnostics Ltd.). Results of ABO grouping were confirmed by reverse grouping using known A and B red cells. For reverse group testing, cells were pooled from three different known donor samples. These pooled cells were prepared daily using pretested known blood group samples.

### Statistics

After data collection, data entry was done in Excel

**Table 1**

| Prevalence of ABO and Rh-D Blood Groups ( Total No 2682 ) | | | | | | | |
|---|---|---|---|---|---|---|---|
| A + | B + | O + | AB + | A - | B - | O - | AB - |
| 576 | 990 | 810 | 198 | 12 | 60 | 30 | 6 |
| A+ (%) | B +(%) | O +(%) | AB+(%) | A -(%) | B -(%) | O -(%) | AB-(%) |
| 21.47 | 36.91 | 30.20 | 7.35 | 0.44 | 2.23 | 1.11 | 0.22 |

## RESULTS

We studied ABO and Rh blood groups in 2682 donors composed of 98.77% male and 2.23% female donors . They were in the age group of 18-60 years. The distribution of ABO and Rh groups is shown in Table 1. Out of 2682 donors, the most common blood group was "B" (39.14%), followed by "O" (32.43%), "A" (21.91%), and "AB" (7.57%) which was found to be statistically significant ($P < 0.05\%$). Rh positivity was found in 2576 (95.93%) donors while 106 (4.07%) donors were Rhesus negative.

## DISCUSSION

The distribution of ABO and RH-D phenotypes in different populations has been extensively studied. These blood group systems are not only important in blood transfusions but also associated with different diseases including cardiovascular diseases, organ transplantation, and erythroblastosis in neonates. Blood transfusion is a life-saving procedure but can cause acute and delayed complications. Complications of blood transfusions with wrongly labeled blood groups may be mild or can be life-threatening. Rh system found to be second most important blood group system due to hemolytic disease of newborn. The importance of Rh system has found in Rh-D negative individuals in subsequent transfusions once they develop Rh antibodies. This D antigen is the most important in transfusion practice in which the person whose red cell lacks the D antigen do not regularly have anti-D in their serum. The aim of this study was to determine the distribution of ABO and Rhesus blood group among blood donors. In our study, the most common blood group was "B" (39.14%), followed by "O" (32.43%), "A" (21.91%), and "AB" (7.57%) which is noncomparable with other studies. The study by Nag and Das5 in West Bengal population were also observed that "O" blood group (34.8%) was common followed by blood groups "B" (33.6%), "A" (23.9%), and "AB" (7.7%) which is noncomparable with our study. Studies by Anjali *et al*.,7 Periyavan *et al*.,8 Enosolease and Bazuaye,9 Das *et al*.,10 Mwangi11 also showed that blood group "O" was the most common followed by group "B," "A" and "AB" which is noncomparable with this study and also the findings regarding occurrence of Rh typing was almost in agreement to that from our study. In our study, Rh positivity was found in 2576 (95.93%) donors while 106 (4.07%) donors were Rhesus negative.. The study by Randriamanantany *et al*.12 also showed that Rh positive was by far the most prevalent which is comparable with our study. Other studies conducted by Hamed *et al*.13 showed 94.23% Rh (D) positivity and 5.77% Rh (D) negativity while Thakral *et al*.14 showed 93.39% Rh (D) positivity and 5.56% Rh (D) negativity which is comparable with our study.

## CONCLUSION

We established that among the various ABO and Rh-D blood groups, blood group "B" is the most common followed by blood groups "O," "A" and "AB" with a predominance of Rh positivity. In addition to compatibility test in blood transfusion practice, knowledge of the blood group distribution is also important for geographical information, genetic studies and for forensic studies in the population.

## REFERENCES

1. Agrawal A, Tiwari AK, Mehta N, Bhattacharya P, Wankhede R, Tulsiani S, *et al.* ABO and Rh (D) group distribution and gene frequency; the first multicentric study in India. Asian J Transfus Sci 2014;8:121-5.
2. Kahar MA, Patel RD. Phenotype frequencies of blood group systems (Rh, Kell, Kidd, Duffy, MNS, P, Lewis, and Lutheran) in blood donors of south Gujarat, India. Asian J Transfus Sci 2014;8:51-5.
3. Kaur H, Khanna A, Manjari M, Khanna M. Prevalence of ABO blood groups and rhesus (Rh) factor in the population residing in and around Amritsar, Punjab (a 4-year study from June 2007 to June 2011). Asian J Transfus Sci 2013;7:159.
4. Chandra T, Gupta A. Frequency of ABO and rhesus blood groups in blood donors. Asian J Transfus Sci 2012;6:52-3.
5. Nag I, Das SS. ABO and Rhesus blood groups in potential blood donors at Durgapur Steel city of the district of Burdwan, West Bengal. Asian J Transfus Sci 2012;6:54-5.
6. Agarwal N, Thapliyal RM, Chatterjee K. Blood group phenotype frequencies in blood

donors from a tertiary care hospital in north India. Blood Res 2013;48:51-4.
7. Anjali H, Issac A, Anjali MR, Anish TS. Transfusion-transmissible infections among voluntary blood donors at government medical college Thiruvananthapuram, Kerala, India. Asian J Transfus Sci 2012;6:55-6.
8. Periyavan S, Sangeetha SK, Marimuthu P, Manjunath BK, Seema DM. Distribution of ABO and Rhesus-D blood groups in and around Bangalore. Asian J Transfus Sci 2010;4:41.
9. Enosolease ME, Bazuaye GN. Distribution of ABO and Rh-D blood group in the Benin area of Niger-delta: Implication for regional blood transfusion. Asian J Transfus Sci 2008;2:3-5.
10. Das PK, Nair SC, Harris VK, Rose D, Mammen JJ, Bose YN, *et al.* Distribution of ABO and Rh-D blood groups among blood donors in a tertiary care centre in South India. Trop Doct 2001;31:47-8.
11. Mwangi J. Blood group distribution in an urban population of patient targeted blood donors. East Afr Med J 1999;76(11):615-8.
12. Randriamanantany ZA, Rajaonatahina DH, Razafimanantsoa FE, Rasamindrakotroka MT, Andriamahenina R, Rasoarilalamanarivo FB, *et al.* Phenotypic and allelic profile of ABO and Rhésus D blood group system among blood donor in Antananarivo. Int J Immunogenet 2012;39:477-9.
13. Hamed CT, Bollahi MA, Abdelhamid I, Med Mahmoud MA, Ba B, Ghaber S, *et al.* Frequencies and ethnic distribution of ABO and Rh(D) blood groups in Mauritania: Results of first nationwide study. Int J Immunogenet 2012;39:151-4.
14. Thakral B, Saluja K, Sharma RR, Marwaha N. Phenotype frequencies of blood group systems (Rh, Kell, Kidd, Duffy, MNS, P, Lewis, and Lutheran) in north Indian blood donors. Transfus Apher Sci 2010;43:17-22.