

## SHORT COMMUNICATION

# Frequency of ABO Blood Groups and RhD Factor in Donors of District Nowshera

Hamzullah Khan

## ABSTRACT

To screen the donors for the frequency of different blood groups, reason for deferral and comparative analysis of the donation in two consecutive years in the blood bank of Qazi Hussain Ahmed Medical Complex Nowshera, a cross sectional study was carried out from April 25, 2017 to May 5, 2019. A total of 3,429 donors were included in the study. The mean age of donors with standard deviation was 35± 3.24 years. Three thousand eighteen (88%) of the donors were males. The distribution of RhD+ and RhD- blood groups was 89.90% and 10.09% respectively. The frequency of 'RhD+ blood groups in target population' was B: 1226 (35.75%), O: 807 (23.53%), A: 754 (22%) and AB: 296 (8.63%). The frequency of 'Rh Negative blood groups' was: B: 139 (4.05%), O: 95 (2.77%), A: 84 (2.45%) and AB: 28 (0.82%). The packed cell wastage rate in our blood bank was 185 (5.4%). The donor deferral rate was 0.7%. Hepatitis B Virus was the major cause of deferral that was reported in 14 cases followed by HCV Virus in 13 cases. It was concluded that the frequency of 'Rh-positive blood group' was B,O,A and AB respectively. Blood Group B was noted in 35% of the donors that counted to be the major prevalent Rh positive blood group in our population. Regarding the Rh Negative blood group, again the frequency was B,O,A and AB. Blood group B- was prevalent as a major negative blood group in our population that was recorded in 4.05% cases. The seroprevalence of hepatitis in the donors was 0.7%.

**Key words:** Transfusion medicine, blood grouping, blood borne infections

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## INTRODUCTION

Blood Banks evolved to save lives in various emergencies. The term Blood Bank refers to the process of collecting the blood, separating the blood contents for different clinical usage, and storing of blood. Healthy and safe blood transfusion is vital, as according to American Red Cross statistics, each year about 5 million people are transfused in the United States only. So far about 400 red cells antigen have been identified in literature. The inheritance of these blood group antigens is by Mendelian Fashion. In literature, the ABO blood group system was first reported followed by the Rh blood group system. These both systems are vitally important for the purposes of blood transfusion.<sup>1</sup>

A study on the prevalence of ABO and Rh Group was conducted in tertiary care hospitals of Peshawar and reported that the Rh Positive blood group distribution in their population was BAO, AB (31.2%), (10.1%), (27%), (31.7%) respectively.<sup>2</sup> Another study from

Islamabad reported that overall distribution of different blood groups in the target population of 1,521 donors was 35.50%, 28.27%, 26.89% and 9.34% for blood groups O, B, A and AB respectively<sup>2</sup>.

The prevalence of Hepatitis B and C viral infections in our country cannot be ignored. Transfusion of infected blood is one of the important causes of the spread of hepatitis. A study from Rawalpindi reported the seroprevalence of Hep B and C in blood donors was 2.52%<sup>3</sup>.

Present study was conducted to screen the donors for the frequency of different blood groups, and the reasons for deferral in the blood bank of a tertiary care hospital of Nowshera.

## METHODOLOGY

A total of 3,429 donors were studied in the blood bank of the Qazi Hussain Ahmed Medical Complex, Nowshera. Duration of study was from April 25, 2017 to May 5, 2019. Out of the total donors, 3,018 (88%) were males.

Selection criteria followed in our blood bank was: age between 18 to 60 years; weight more than 50kg; and haemoglobin of >11g/dl. Exclusion criteria was any

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**Correspondence:** Hamzullah Khan, Professor of Haematology and In-charge Blood Bank, Nowshera Medical College, Qazi Hussain Ahmed Medical Complex, Nowshera, Pakistan

**Email:** hamzakmc@gmail.com

pervious history of viral disease like Hep B and C and HIV, drug abuse, body tattooing/needling/piercing, previous transfusion of whole blood or blood component in the past 6 months and or any renal, cardiac, pulmonary or hepatic diseases.

All the donors were screened for HBsAg, Anti HCV antibodies and HIV antibodies was done through ELISA using COBAS 311 (ROCHE) version.

Data was entered in SPSS version 25. Numerical variables like age of patients were presented with mean and standard deviation while the categorical variables like type of blood group and infection was presented with percentages.

## RESULTS

A total of 3,429 donors were received in the blood bank. The age range of the donors was from 18 years to 52 years with mean age of 35 ( $\pm 3.24$ ) years. Three thousand and eighteen (88%) donors were males and 411(12%) were females. The frequency of RhD+ and RhD- groups among the donors was 89.9% and 10.1% respectively. The frequency of ‘Rh Positive blood groups’ was B: 1226 (35.75%), O: 807 (23.53%), A: 754 (22%) and AB:296 (8.63%). The frequency of ‘Rh Negative blood groups’ was: B: 139 (4.05%), O: 95 (2.77%), A:84 (2.45%) and AB: 28 (0.82%) (Table 1).

Table 1. Frequency of ABO and Rh D Blood Groups of Donors Presenting to the Blood Bank of Qazi Hussain Ahmed Medical Complex, Nowshera

Blood Group	No. of Donors	Percentage
B+	1226	35.75
O+	807	23.53
A+	754	21.99
AB+	296	8.63
B-	139	4.05
O-	95	2.77
A-	84	2.45
AB-	28	0.82
Grand Total	3,429	

Table 2. Cause of Deferral of Donors

Reason for Deferral	No. of cases	Percentage
Hbs Ag positive	14	50
HCV Ab Positive	13	46.43
MP Positive	1	3.57
Grand Total	28	

Out of total 3,429 donations, 185 (5.4%) bags expired in the last two years, 24 (0.7%) was donor deferral rate due to positive virology. A total of 3,034 (88.48%) bags were issued for transfusion after verification/screening and crossmatch. Hepatitis B Virus was the main cause of deferral that was reported in 14 cases followed by HCV Virus in 13 cases. In one case, malarial parasite was reported on smear and was deferred to be transfused (Table 2).

## DISCUSSION

Blood transfusions have been used in medical practice since 1930 for various clinical indications. Soon after the introduction of blood banks for better storage and safe transfusion, the use of blood became more common in clinical set ups. In Pakistan, more than 1.5 million bags of blood are donated each year. Among these donors, 65% are the relatives of the patient, that is, replacement donor, while 25% are volunteer donors and about 10% are professional blood donors.<sup>4-6</sup>

We observed the mean age of 35 years with male predominance 3,018 (88%). In present study, the frequency of ‘Rh Positive blood groups’ was B: 1,226 (35.75%), O: 807 (23.53%), A: 754 (22%) and AB:296 (8.63%) while the frequency of ‘Rh Negative blood groups’ was: B: 139 (4.05%), O: 95 (2.77%), A:84 (2.45%) and AB: 28 (0.82%).

Another study from Rawalpindi-Islamabad coincides in its findings with ours. It reports that among volunteer blood donors, 3,519 (79.5%) were males. B+ve blood group was the most common (31.2%). Frequency of ABO groups was A+ve, AB+ve, O+ve, A-ve, B-ve, and O-ve was 21.5%, 9.8%, 29.7%, 1.8%, 2.9%, and 2.5% respectively. The distribution of Rh+ and Rh- blood groups was 92.2% and 7.8% respectively in their population<sup>7</sup>.

Going through the international literature, as study from Tanzania reported that the most common blood group in their population was O (52.3%) and the rarest was AB (3.18%). A total of 97.7% of the donors in their set up were Rh positive and 2.3% were Rh negative. Most donors were in the age range of 19-29 years. The male to female ratio among the donors was (88.1%):11.90<sup>8</sup> that strongly coincides with our findings.

Another study from Islamabad agreed with our findings. They showed that among ABO blood groups, the most prevalent was B (33.5%), followed by O (31.3%), A (22.5%) and AB (12.4%)<sup>9</sup>.

The sero-prevalance of hepatitis in our study was 0.7%. Hepatitis B Virus was the main cause of deferral that was reported in 14 cases followed by HCV Virus in

13 cases. A study from Rawalpindi and Islamabad reported that the prevalence of Hepatitis B in their donors was 2.45% with a male gender predominance while that of Hepatitis C was 2.52%<sup>4</sup>. A retrospective study from Iraq reported that out of the total sampling of 495,648 blood donors, only 3258 (0.6%) were positive for hepatitis B and 933 (0.3%) were positive for hepatitis C,<sup>10</sup> that coincides with our findings.

In our study, the packed cell wastage rate was 5.4%. The average expiry rate in blood bank is reported for packed cell wastage in hospitals ranging from 1.93% to 30.7%<sup>11</sup>, which coincides with our findings.

## CONCLUSION

The descending order of the frequency of "Rh-positive blood group" in the target population was B, O, A and AB. Regarding the Rh Negative blood group, again the descending distribution of blood group was B, O, A and AB. To control the spread of viruses in blood transfusions, there is a need for public awareness through advocacy, communication and social mobilization and health education activities. Selection of healthy and young blood donors should be encouraged.

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