

FREQUENCY OF ABO AND RH (D) BLOOD GROUPS INVOLVING VOLUNTEER DONORS IN DISTRICT NOWSHERA

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ABSTRACT

Objective: To find out the frequency of ABO and Rh (D) blood groups among healthy volunteer blood donors in District Nowshera.

Methodology: This descriptive cross sectional study was conducted from April, 2015 to March, 2016 in District Nowshera. Blood group of 1190 healthy college's students who wanted to donate blood were analyzed while data of 2410 blood donors were collected from Civil Hospital, Pabbi and District Hospital Nowshera. The data of total study subjects (3600) were analyzed following standard statistical procedures.

Results: Out of 3600 healthy adult donors, males were 2580 and females were 1020, with a male to female ratio of 2.52:1. Group 'B' (32.0 %) was found to be most predominant blood group, followed by "O" (29.8%), "A" (27.4 %) and "AB" groups were (10.8 %). Rh (D) was found to be positive in 3348 (93%) subjects in the study population.

Conclusion: Blood group 'B' had the maximum frequency and 'AB' had the minimum occurrence among blood donors of District Nowshera. Majority of blood groups were Rh (D) positive.

Key Words: Blood grouping, Blood donors, District Nowshera

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INTRODUCTION

The antigens of blood groups ABO and Rhesus (Rh) are the most regularly studied genomic pointers in a large group of people¹. Among several other blood groups determined so far, the ABO blood groups are very important to date in view of the safe transfusion practices². The awareness about the distribution of blood groups is crucial for effective blood bank records and transfusion services. Besides, the information is also important for medical verdict, genetic knowledge, genetic analysis and also for the broad-spectrum wellbeing of the humans.

The findings of different studies showed that blood group "O" and "A" are common in USA³ and Saudi Arabia⁴. Whereas, in west Bengal, the incidence of group "A" was maximum⁵. In some parts of Pakistan, group "O" was reported dominant while in other regions group "B" was the most frequent^{6,7}. It is consequently essential to know about the allocation of these blood groups. The current study was therefore, planned to scrutinize the same in blood donors of District Nowshera. It will not only provide baseline data for future research work in this field but it will be useful to clinicians and various blood donors societies, who are responsible for pro-

urement of blood to the patients.

METHODOLOGY

A total number of 3600 healthy adult donors were included in the study. The subjects included both male (2580) and female (1020). Data of 2410 donors were collected from the record of the two hospitals of District Nowshera. While blood samples of 1190 college's students who want to donate the blood were collected by finger prick in most cases and occasionally by venipuncture through a disposable syringe (Table 1).

The blood samples were examined with standard Tile's techniques; using anti-A, anti-B and anti-D sera⁸. Both forward (cell grouping) and reverse grouping (serum grouping) methods were used. The final blood group was confirmed only if both forward and reverse groups were identical. Weak "D" red cells were considered to be Rh (D) positive. The data was compiled and then analyzed for the frequency of ABO and Rh-D blood groups with standard statistical methods.

RESULTS

Out of 3600 healthy adult donors, males were 2580 and females were 1020, with a male to female ratio of

Table 1: Distribution of subjects

Study Place	Number of subjects
District Headquarter Hospital, Nowshera	1690
Tehsil Headquarter Hospital, Pabbi	720
Government College (Boys), Nowshera	380
Government College (Girls), Nowshera	265
Polytechnic College, Nowshera	182
Government College, Pabbi	237
Government College, Akora Khattak	126
Total number of subjects	3600

Table 2: Pattern of blood groups in donors of District Nowshera

Blood Group	Number of Subjects	Percentage
'A'	986	27.4 %
'B'	1153	32.0 %
'AB'	389	10.8 %
'O'	1072	29.8 %
Rh(D)-positive	3348	93.0%
Rh(D)-negative	252	07%

Table 3: Gender-wise distribution of blood groups

Blood Group	Number of male Subjects	Number of female Subjects
'A'	704	282
'B'	823	330
'AB'	297	92
'O'	756	316

Table 4: Comparison with other studies (in percentage)

Blood Group	Present Study	Peshawar ¹⁴	Mardan ¹¹	Islamabad ¹²	Saudi Arabia ¹³	USA ³
'A'	27.4	28	24.75	25.53	33.4	40
'B'	32.0	34	27.97	33.33	6.0	10
'AB'	10.8	07	19.36	10.04	3.8	05
'O'	29.8	31	27.93	31.10	56.8	45
Year of Study	2016	1993	2013	2006	2009	1988

2.52:1. The frequency data of blood groups (ABO and Rh) of 3600 donor subjects are presented in table 2. Group 'B' (32.0 %) was found to be most predominant blood group. The next highest was group 'O' (29.8 %). Rh (D) was found to be positive in 3348 (93%) subjects in the study population. The gender distribution of blood groups (ABO and Rh) is shown in table 3. Both the sexes showed almost the same array of distribution regarding frequency of blood groups.

DISCUSSION

The allocation of blood group are variable in different races, tribal groups, and socio-economic populations^{9,10}. In the present study, the blood donors in District Nowshera have high percentage of group 'B'. The second dominant was group 'O'. Similar results were reported earlier^{11,12}. However, in USA and Saudi Arabia

most dominant group was 'O' and second common was 'A'^{3,13}. (Table 4)

Rh (D) was negative in 07 % donors of study population. Other researchers found less Rh (D) negative (5%)¹⁴. While Egyptians have no negative 'A' and 'AB' groups⁴. As far as Rh phenotype is concerned, the overall trend is very high for Rh (D) positive as compared to the negative phenotype^{6,7}. Weak D were considered to be Rh (D) positive among donors because when weak D red cells are transfused to D-negative patients, the patients get immunized and produce anti-D. Blood transfusion services usually give weak D donors the designation "Rh positive, weak D. While as recipients, patients with the weak D phenotype are considered to be Rh (D)-negative, and usually receive only Rh (D)-negative red cells.

The national and International studies have shown that majority of Asians have a typical B>O>A>AB pattern while most Africans, Americans, Australians and English exhibit an O>A>B>AB pattern of ABO phenotypes^{7,12}. Some European nations on the other hand show an A>O>B>AB pattern³.

A study documented the associations of blood groups 'A' and 'O' to carcinoma stomach and duodenal ulcer respectively⁷. While some scientists demonstrated that the 'O' group individuals are more physically fit than 'A' group individuals. Besides, 'O' group subjects have got a 60% chance of reaching 75 years of age⁶.

Another study reported that 'O' and 'B' mothers are more successful in reproduction and indicate low percentage of perinatal loss (stillbirths and abortions) as compared to other groups. Besides, they highlighted that Rh negative mothers have more male's birth than Rh positive mothers¹⁴.

CONCLUSION

Blood group 'B' had the maximum frequency and 'AB' had the minimum occurrence among blood donors of District Nowshera. Majority of blood groups were Rh (D) positive.

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CONTRIBUTORS

BHK conceived the idea, planned the study, and drafted the manuscript. SA and AHK helped acquisition of data, drafted the manuscript and did statistical analysis. All authors contributed significantly to the submitted manuscript.