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DISTRIBUTION OF DIFFERENT BLOOD GROUPS DATA FROM BLOOD BANK REGISTRY IN PESHAWAR, PAKISTAN

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ABSTRACT

Objective: To determine the distribution of ABO and Rh-blood groups in district Peshawar.

Methodology: This was a Cross-sectional descriptive study, done in the Blood Bank of Khyber Teaching Hospital Peshawar. Participants of all ages and gender referred to the Blood bank for blood grouping and blood donors were included. Sampling was done using the non-probability purposive sampling method. Blood grouping was done using commercially available Antisera by the trained Blood Bank clinical technician. The blood groups were recorded in the proforma and data was analyzed. Standard deviation and Mean were used for quantitative data. Qualitative data was analyzed using Frequency and percentages.

Results: Mean age of 2902 recipients was 39 ± 9.2 (range 18-60) years. There were 2900 (99.9%) males and 2 females (0.1%), because females are mostly deferred due to not fulfilling donor selection criteria. The commonest blood group was B (30.9% cases), followed by blood group A (29.8% cases), O (28.3%), and AB (10.8%). Rhesus positive blood group was common (92.1%) as compared to Rhesus negative (7.9%).

Conclusions: Blood group B-positive was the commonest blood group. AB-negative was the rarest one.

Keywords: Anti-Serum; Blood group; Blood Bank.

INTRODUCTION

The blood group is determined genetically by the presence or absence of certain antigens on the surface of red blood cells.¹ So far 400 red blood cell antigens have been discovered and there are 29 blood group systems.^{2,3} However, the antigens that are responsible for the majority of transfusion reactions are those of ABO and Rhesus blood group system.¹

Karl Landsteiner was the first scientist who gave the concept of the ABO blood group in 1901.² Later on, Wener and Landsteiner discovered the Rhesus blood group system.¹ The blood group is designated as per a particular antigen on the red blood cell membrane. For example, A group means that the person has An antigen on red blood cells. On the other hand, Rh (Rhesus) antigen presence is designated as positive and vice versa.² So, a person who has an A blood group has Rh antigen on the red cell membrane will be said to have an A positive blood group. The blood group and hence the presence of a particular antigen on the red blood cell membrane is determined genetically.⁴ The ABO genes and Rhesus genes are located on chromosomes 9 and 1 respectively.^{4,5,7-9}

There is wide variation in the blood groups in the community.⁴ It is a fact that the blood groups are associated with certain cancers of salivary glands, stomach, lung, and other cardiovascular diseases.² So, determining the pattern of blood group distribution in a community is important.

Research suggests that the Pakistani population shows a wide range of variation in blood groups in different areas and people of different ethnicity.² Therefore, the current study was done to know the frequency of different blood groups in the district Peshawar. The findings of this research will provide data that will help in providing transfusion services to the community.

METHODOLOGY

This Cross-sectional descriptive study was conducted at the Blood Bank of the Khyber Teaching Hospital Peshawar which is a 1200 bedded tertiary care center located in the heart of Peshawar. The study was done from January to September 2021 (9 months duration). Ethical approval was obtained from the departmental ethical review board. About 2902

participants of all ages and both genders were referred to the Blood Bank for Blood grouping and blood donors were enrolled after taking informed consent and using the nonprobability purposive sampling technique. Cases that failed to fulfill donor selection criteria were excluded. About 2 ml blood sample was taken from the participants in EDTA tubes. The blood group was found using commercially available Anti sera i.e., Anti A, Anti B, and Anti D by a trained blood bank technician. The blood group was identified and recorded in a proforma and was analyzed accordingly. Quantitative variables were analyzed using standard deviation and mean. Frequency and percentage were used for qualitative data. Data were analyzed using SPSS version 20.

RESULTS

About 2902 participants from different areas of district Peshawar to the Blood Bank referred for blood grouping were included in the study. The mean age of the study sample was 39 ± 9.2 (range 18-60) years. There were 2900 (99.9%) males and 2 females (0.1%). The pattern of different blood groups is shown in table 1 and figure 1.

DISCUSSION

The blood groups play a significant role in transfusion reactions in adults and neonates, organ transplantation, and research purposes.⁴ With improved health care facilities, the demand for blood products has greatly increased. In Peshawar, various public and private sector transfusion centers and blood banks are working in collaboration to provide ample safe blood products to the general masses. The present study showed that B positive was the commonest blood group AB negative was the rarest. Additionally, Rhesus positive blood group was more common than the Rhesus negative.

Similar findings are shown in a system-

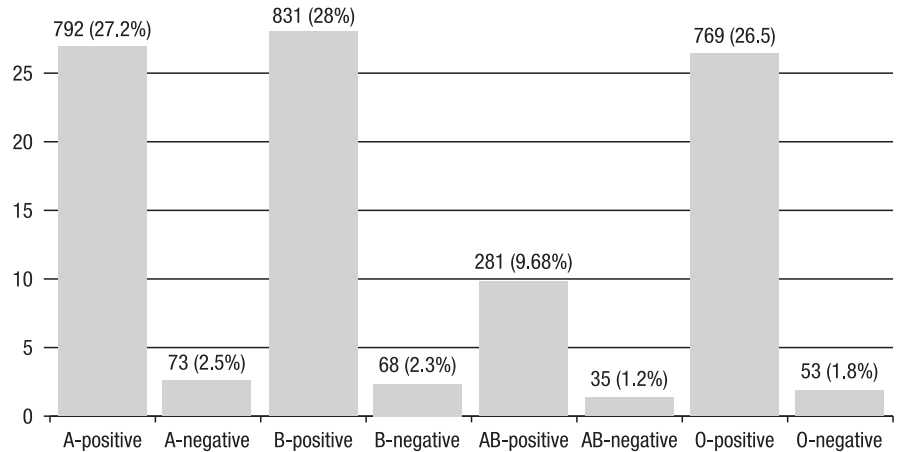


Figure 1: Frequency of different blood groups in participants

Table 1: Pattern of different blood groups in study participants

Type	Blood group	n (%)
ABO Blood Groups	A	865 (29.8%)
	B	899 (30.9%)
	O	822 (28.3%)
	AB	316 (10.8%)
Rhesus Blood Groups	Rhesus positive	2673 (92.1%)
	Rhesus negative	229 (7.9%)

ic review done on the frequency of blood groups in the Pakistani population, where the B group was reported commonest, while AB the rarest.²

Also, Rh- positive blood group was common as compared to Rhesus negative blood group.² Rhesus positive blood group was common as compared to Rhesus negative.¹ A study from Swat also shows a predominance of B blood group.⁶ Similar data were reported by a study done by Sabir et al from Safdarabad where the B blood group was the commonest.⁴ However, the same study reported group O as the commonest in Faisalabad.⁴ Other local studies at the national level also show group O as the commonest.¹⁰⁻¹² Group O was reported as the commonest in international studies from Saudi Arabia¹³, Bahrain¹⁴, Iran¹⁵, India¹⁶, and Bangladesh.¹⁷ In the United States, Europe, Iran, and China, group O is the commonest, and AB is rarest.^{1,2,5}

Nevertheless, group A is reported as

commonest from Dir.¹⁸ Group A blood group was also reported as the commonest in a study done by Nazli R from Peshawar.¹⁹ In different international studies done so far in Turkey²⁰ and Palestine²¹ blood group A was reported as the commonest one. This data shows that the spectrum of the blood group distribution is diverse, and it differs in various areas of the world. The main reason for the difference in the prevalence of these groups in these areas is due to the diversity in the genetic makeup of the population in these areas.

Due to the rarity of the AB blood group in our region, as shown in this study, we recommend that strategies should be developed to ensure the acquisition, storage, and timely availability of blood AB blood group in blood banks.

Well-trained surveillance teams should be assigned to operate software developed to interconnect the different blood banks in peshawar, which should ensure ample

stores of AB blood group in blood banks, so that in times of catastrophic crises, this rare blood may not go into shortage.

CONCLUSION

The most prevalent blood group in our region is B. AB group is the least common blood group in this part of the world. Rhesus negative blood is rare as compared to Rhesus positive.

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REFERENCES

- Andalibi M, Dehnavi Z, Afshari A, Tayefi M, Esmaeili H, Azarpazhooh M, et al. Prevalence of ABO and Rh blood groups and their association with demographic and anthropometric factors in an Iranian population: Mashad study. *East Mediterr Health J.* 2020;26(8):916-22. DOI:10.26719/emhj.20.048.
- Rehman GU, Shi H. ABO and Rh (D) Blood groups distribution in Pakistan: A systemic review. *Forensic Res Criminol Int J.* 2020;8:237-44.
- Kayiran SM, Oktem O, Kayiran PG, Paloglu E, Gurakan B. Frequency of ABO and Rhesus blood groups among neonates born at a private hospital in Istanbul. *Southeast Asian J Trop Med Public Health.* 2012;43(2):467-70.
- Sabir A, Iftikhar A, Ijaz MU, Hussain G, Rasul A, Iqbal RK, et al. Retrospective study of frequency of ABO and Rhesus blood group among population of Saffarabad and Faisalabad cities of Pakistan. *BMC Res Notes.* 2021;14(1):1-5. DOI:10.1186/s13104-020-05429-z
- Liao H, Li J. Distribution characteristics of ABO and RhD blood groups among the voluntary blood donors in Chongqing: A retrospective study. *Medicine (Baltimore).* 2020;99(42):e22689. DOI:10.1097/MD.00000000000022689.
- Khattak ID, Khan TM, Khan P, Shah SMA, Khattak ST, Ali A. Frequency of ABO and Rhesus blood groups in District Swat, Pakistan. *J Ayub Med Coll Abbottabad.* 2008;20(4):127-9.
- Sawadogo S, Nebie K, Millogo T, Kafando E, Sawadogo AG, Dahourou H, et al. Distribution of ABO and RHD blood group antigens in blood donors in Burkina Faso. *Int J Immunogenet.* 2019;46(1):1-6. DOI:10.1111/iji.12408
- Jahanpour O, Pyuza JJ, Ntiyakunze EO, Mremi A, Shao ER. ABO and Rhesus blood group distribution and frequency among blood donors at Kilimanjaro Christian Medical Center, Moshi, Tanzania. *BMC Res Notes.* 2017;10(1):1-5. DOI:10.1186/s13104-017-3037-3.
- Paridar M, Shoushtari MM, Kiani B, Nori B, Shahjehani M, Khosravi A, et al. Distribution of ABO blood groups and rhesus factor in a Large Scale Study of different cities and ethnicities in Khuzestan province, Iran. *Egypt J Med Hum Genet.* 2016;17(1):105-9.
- Mahmood MA, Anjum AH, Train S, Shahid R, Usman M, Khawar S. Pattern of ABO and Rh blood groups in Multan region. *Biomedica.* 2005;21:1-4.
- Parveen N, Rehman J, Hassan SH, Hassan Z, Rehman M. Different Blood Groups. *The Professional Med J.* 2016;23(08):1001-4.
- Anees M, Mirza MS. Distribution of ABO and Rh blood group alleles in Gujrat region of Punjab, Pakistan. *Proc Pak Acad Sci.* 2005;42(4):233.
- Bashwari L, Al-Mulhim AA, Ahmad MS, Ahmed MA. Frequency of ABO blood groups in the Eastern region of Saudi Arabia. *Saudi Med J.* 2001;22(11):1008-12.
- Al-Arrayed S, Shome DK, Hafadh N, Amin S, Al Mukhareq H, Al Mulla M. ABO blood group and RhD phenotypes in Bahrain: results of screening school children and blood donors. *Bahrain Med Bull.* 2001;23(3):112-15.
- Boskabady M, Shademan A, Ghamaami G, Mazloom R. Distribution of blood groups among population in the city of Mashhad (North East of Iran). *Pak J Med Sci.* 2005;21(2):194-8.
- Sidhu S. Distribution of the ABO blood groups and Rh (D) factor among the scheduled caste population of Punjab. *The Anthropologist.* 2003;5(3):203-4.
- Talukder S, Das R. Distribution of ABO and Rh blood groups among blood donors of Dinajpur district of Bangladesh. *Dinajpur Med Col J.* 2010;3(2):55-8.
- Shah H, Haram U, Naz F, Haseeb A, Ullah R, Jan A, et al. Distribution of ABO and Rhesus Blood Groups in general population of district Dir Upper. *Pak J Physiol.* 2016;1212(44):37-9.
- Nazli R, Haider J, Khan MA, Akhtar T, Aslam H. Frequency of ABO blood groups and RhD factor in the female population of District Peshawar. *Pak J Med Sci.* 2015;31(4):984-6. DOI:10.12669/pjms.314.6640.
- Dilek İ, Demir C, Ali B, Akdeniz H. ABO and Rh blood groups frequency in men and women living in eastern Turkey. *Int J Hematol Oncol.* 2006;30(4):023-6.
- Skaik Y, El-Zyan NR. Spectrum of ABO and Rh (D) blood groups amongst the Palestinian students at Al-Azhar University-Gaza. *Pak J Med Sci.* 2006;22(3):333.

Author's Contribution

MI conceived the idea, collected the data designed the study and performed the data analysis. MIK and SNM contributed in data collection and literature review. Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of Interest

Authors declared no conflict of interest

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None

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.