



ORIGINAL ARTICLE

Distribution of ABO and Rh(D) blood groups in Baloch ethnicity of Mekran Division, Balochistan, Pakistan.

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ABSTRACT... Objective: To evaluate the distribution of ABO and Rh(D) blood groups in Balochistan. **Study Design:** Cross-sectional study. **Setting:** In Three Districts of the Mekran Division. **Period:** December 2019 to September 2021. **Material & Methods:** After informed consent, blood grouping (ABO) and Rh D factors were determined for 14547 people who visited hospital laboratories and blood banks between December 2019 and September 2021 for blood grouping, blood donation, or any other medical reason. The blood type was determined using the antigen-antibody agglutination slide test. **Results:** Among 14547 individuals, 39.03% (5679) had blood group O, 27.59% (4014) had blood group B, 24.99% (3636) had blood group A and 8.37% (1218) had blood group AB. 86.7% of individuals were Rh D factor positive while 13.3% individuals were Rh-negative. **Conclusion:** In the Mekran division of Balochistan, the most prevalent blood group is O +ve, while the least prevalent blood group is AB -ve.

Key words: Antigen-antibody Agglutination, Blood Grouping, Rh d Factor.

INTRODUCTION

The ABO blood group system is globally recognized and ranks among the first genetic polymorphism discovered. It is considered the best-known system for blood grouping and has a prime significance in transfusion medicine.¹ In the quest to find the answer to why few blood transfusions were successful, and others were life-threatening, Karl Landsteiner, an Austrian scientist, found the ABO blood grouping system in 1901.² Genetic studies show the ABO gene is located on chromosome no.9 (9q34.1 – q34.2). ABO represents the presence of antigens, a carbohydrate on glycolipid and glycoprotein of the erythrocytes. H-antigen, located on chromosome no.19, is a precursor of antigens A and B, determined by FUT1 (H) and FUT2 (se) protein-coding genes.³

ABO blood group system appears to be important in the evolutionary process. The frequency of blood type differs among various

populations suggesting that specific blood type individuals show susceptibility and resistance to many infectious and non-infectious diseases. Due to the location of antigen on the surface of the erythrocyte, it can act as a receptor for many pathogens such as protozoa of malaria, viruses, i.e., norovirus and HIV, and bacteria, i.e., shigella and cholera.⁴ Higher incidence and association of different blood groups have been linked with a higher incidence of cancers. Blood group A is associated with gastric, ovarian, endometrial, and colorectal cancers.⁵⁻⁹ A study discovered that people with the blood group AB were at greater risk of developing cognitive impairment.⁴ Studies have shown a correlation between COVID-19 mortality and blood group, with B blood group persons having a higher mortality rate and O blood group individuals having a lower mortality rate.¹⁰ In order to identify the distribution of ABO and Rh phenotypes in different ethnicities and cultures around the world, several studies have been carried out in this area. The data from

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different ethnic groups is important for studying genetics, migration pattern, and forensic analysis of a population.¹¹ No report of ABO blood group distribution was found for a 10 million population of Baloch ethnicity living in the Balochistan, Mekran division region located southeastern-most edge of the Iranian plateau. This study was conducted to assess the ABO blood group distribution of the Baloch population residing in the Mekran division of Pakistan.

MATERIAL & METHODS

This Cross Sectional study was conducted in Mekran Balochistan from December 2019 to September 2021 after approval from ethical committee (ERC/02/2019). Data of 14547 subjects from the Mekran division comprising three Baloch majority districts (Kech, Panjgur and Gwadar) of Pakistan who visited hospital laboratories and blood banks for blood grouping, blood donation or any other medical reason were obtained. After informed consent, the patient samples were collected by cubital venipuncture and transferred to a tube containing ethylenediaminetetraacetic acid (EDTA) to prevent blood clotting. The antigen-antibody test was performed using the slide method to determine blood grouping and RhD levels. Antisera A, B, and D were combined

with a drop of blood at three different locations on a clean slide. The agglutination of the blood was detected in each of the three locations. Agglutination was used to confirm the results, and microscopy was used to validate the results of any dubious cases. The data were analyzed with the help of the SPSS program version 23.

RESULTS

Blood samples was collected from a total of 14547 individuals. 86.7 percent of them were positive for Rh-D, whereas just 13.27 percent tested negative for Rh-D. Group O was the most prevalent, accounting for 39.03 percent of all cases, followed by Group B, which accounted for 27.59 percent and Group A, which accounted for 24.99 percent. The AB blood type was the least prevalent, accounting for 8.37 percent of all cases. Table-I depicts the distribution of blood types and Rh in relation to one another.

DISCUSSION

Even though transfusion treatment has saved many people's lives throughout the world, the shortage of blood supply in the circumstances such as trauma, pregnancy, and certain disorders presents a danger to patients.

Blood Groups	N	Percentage	% RhD+	%RhD-
A	3636	24.99%	22.12%	2.87%
B	4014	27.59%	23.23%	4.36%
AB	1218	8.37%	7.70%	0.67%
O	5679	39.03%	33.65%	5.37%

Table-I. Distribution of ABO blood groups in Baloch ethnicity Mekran Division of Pakistan

Population/Ethnicities	Blood Group O	Blood Group B	Blood Group A	Blood Group AB
African ¹⁸	46.6	25.95	23.06	4.4
Arabs ¹⁶	56.8	6	33.4	3.8
Baloch (Present study)	39.03	27.59	24.99	8.37
Chinese ¹⁷	35.54	24.14	31.90	8.42
German ¹⁹	41.21	10.71	43.26	4.82
Indian ¹⁵	38.75	32.69	18.85	5.27
Iranian ¹³	40.21	23.39	28.48	6.6
Kurd ¹¹	38.9	17.6	33.9	9.6
Pakistani ¹²	33.14	33.37	33.99	9.74
Turkish ¹⁴	44.07	9.26	44.07	2.60

Table-II. Frequency of ABO blood groups in various countries around the globe.

Due to the Balochistan province's remote location, lack of sophisticated medical facilities, frequent traffic accidents, and the need for expert and subspecialist procedures, blood supply is vital in the region. The proportion of the ABO and RhD blood types differs across the globe from population to population. as shown in Table-II.¹¹⁻¹⁹

In the current study, over the course of almost two years (2019 to 2021), the frequency of different blood groupings in the Mekran division (Turbat, Gwadar & Panjgur) of Balochistan was studied. Among the 14547 people studied, blood group type O was the most common, making up 39.03 percent of all the blood groups. The second most frequent blood type was B. (27.59 percent). AB blood group was the least prevalent blood type, accounting for 8.37 percent of all samples. 86.7 % of the individuals were Rh-positive, whereas 13.3 % were Rh-negative.

A literature review shows that blood group varies across provinces in Pakistan. Hussain et al. conducted a study in Quetta, Baluchistan, Pakistan and reported the prevalence of blood group AB as (7.57%), blood group A (21.12%), Blood group B (34.32%) and blood group O as (37.07%).²⁰ Khaskheli et al. conducted a study at Sindh which concluded that blood group O was most prevalent (36%), Group B was present in 30%, group A was present in 25%, and blood group AB was present in 9% of the study population.²¹ According to Khan et al., a research conducted in the twin towns of Rawalpindi and Islamabad revealed that 11.20 per cent of the study population had blood group AB, 24.02 percent had blood group A, 31.91 percent had blood group O, and 32.87 percent of female individuals had blood group B.²² Study conducted by Khan MS et al. at Bannu KPK, Pakistan concluded that blood group AB was found in 7.67 %, blood group O in 25.07%, Blood group A is 31.03% and blood group B in 36.23% of the study population.²³ Blood type O is shown to be prominent in Sindh and in Quetta, Baluchistan, which is consistent with our research findings. According to studies conducted in the Khyber Pakhtunkhwa and Punjab provinces, blood type B is the most prevalent, in contrast to our findings.

Blood type O seems to be more widespread in various locations of the world, according to various studies. For example, in Arabs (56.8%), Africans (46.6%), Chinese (35.54%) and in Iran, 40.21% of the study population had blood group O.^{16,18,17,13}

Mekran division shares a border with the neighboring country Iran, and a lot of trade goes between the two countries. The Mekran division's residents and Iran, have relatives across the border. Blood group O was the most frequent kind in our research, accounting for 37.07 percent of the total. This is comparable with a study done in Iran by Paridar et al., who found that blood group O was the most prevalent type.¹³

The findings of our research are consistent with those of previous studies conducted in various parts of Pakistan, which stated that the RhD-Positive blood group is the most prevalent blood type, Study by Khan MS et al. stated that Rh positives blood group was present in 92.45% of the population. In comparison, Rh negatives accounted for 7.55%, which is in line with the findings of the current study.²³

Research on blood types was carried out in Balochistan's Mekran division for the first time. The findings may be used in future policy development regarding blood storage, making a list of potentially available blood donors with the least common blood group type.

CONCLUSION

According to our research findings, the O +ve blood type is the most widespread in the Mekran division of Balochistan, while the AB -ve blood group is the least prevalent.





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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Taif Hameed	Data collection, Write up.	
3	Noman Sadiq	Write up, Overall Supervision, Final drafting.	
4	Shabeer Ahmed	Data collection, Write up.	
5	Hammal Naseer	Write up.	