



## **Prevalence of ABO and Rh Blood Group In District Karak (Female)**

**Arshad Abbas<sup>1</sup>, Bilal Abbas<sup>2</sup>, Sahar Aziz<sup>3</sup>, Faizan Ullah<sup>2</sup>, Waheed Ali Panhwar<sup>4</sup>, Asif Ali<sup>5</sup>, Mehwish Khalid<sup>6</sup>, Haleema Sadia<sup>7</sup>, Shahid Raza<sup>8</sup>, Kamran Akhter<sup>9</sup>, Wisal Ahmad<sup>10</sup>, Fazle Akbar<sup>11</sup>, Muhammad Zeeshan<sup>12</sup>, Habibullah<sup>13</sup>, Safiullah Khan<sup>14</sup>**

<sup>1</sup> Department of Zoology GPGC Karak KP Pakistan

<sup>2</sup> Department of Genetics Hazara University Mansehra, PK

<sup>3</sup> Lahore College for Women University Lahore, Pakistan

<sup>4</sup> Assistant Professor Department of Zoology, Shah Abdul Latif University Khairpur Mirs Sindh Pakistan.

<sup>5</sup> Department of Zoology and Biology, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Pakistan

<sup>6</sup> Department of Biology, PMAS Arid Agriculture University Rawalpindi

<sup>7</sup> Department of Biotechnology, University of Information Technology, Engineering and Management Sciences Quetta

<sup>8</sup> Department of Food Science & Technology, UCP (University of Central Punjab, Lahore)

<sup>9</sup> Deputy Director Rerural Poultry livestock Department, Balochistan Quetta.

<sup>10</sup> COMSATS University Islamabad Park Road, Tarlai Kalan, Islamabad 45550, Pakistan.

<sup>11</sup> Department of Agriculture Chemistry, University of Agriculture Peshawar, Pakistan.

<sup>12</sup> Department of Biotechnology, Abdul Wali Khan University, Mardan, KP, Pakistan.

<sup>13</sup> M.Phil Microbiology, Quaid i Azam University, Islamabad.

<sup>14</sup> Lecturer Government College NO.1. D.I. Khan.

Corresponding Author's Email: [juliaabbas114@gmail.com](mailto:juliaabbas114@gmail.com)

### **ABSTRACT**

*The present study was completed in the duration of 4 months started from 1st February to 1st June over that period total of 402 female blood groups were checked aging from 18 to 28 years. The amounts of sample are less accordingly this is because Pakistan is a Muslim country and more ever the study is conducted in Pashtun cultured areas where non-relative girls and boys are strictly prohibited from any kind of interaction but somehow we barely managed to check the above female either through our relative hired females or by self somewhere. The samples were mainly collected from Khushal Khan Khattak University Karak and Girls degree colleges. During the present study total of 402 girls' blood groups and Rh factor were checked out of which B+ was the most abundant of all and AB- was found to be the least one. The trend found is B>O>A>AB. The purpose of this work is to find out average abundance of ABO and Rh blood groups and to store the data for onward research work.*

**Key Words:** Female, ABO and Rh blood groups, Kpk Karak.

Received 29.11.2019

Revised 06.12.2019

Accepted 03.01.2020

### **INTRODUCTION**

The ABO blood group system for the first time discovered by Landsteiner in 1901. Later Landsteiner and Wiener defined the Rh blood group in 1941 [1]. About 700 red blood cell antigens are described and organized into 30 blood group systems by the International Society of Blood Transfusion out of which ABO and Rh are most important. In this system antibodies are accordingly and predictably be present in the blood serum of normal individuals whose red blood cells have no antigens [2]. Rhesus is the second type of blood group system. There are two Rh phenotype that as Rh positive and Rh negative, depending on whether Rh antigen is present on the red blood cell or not. The ABO blood groups determination is done by detecting A and B antigens. In addition, it can also be determined with the help of anti-bodies in the blood serum that as red blood cells having anti-body A will contain antigen B and red blood cells having anti-body B will contain antigen A and that having no anti-bodies will contain both antigen A and B

and red blood cell having both type of anti-bodies will have no antigen and is called blood group O. ABO and Rh gene phenotypes vary widely across races and geographical boundaries [3-5].

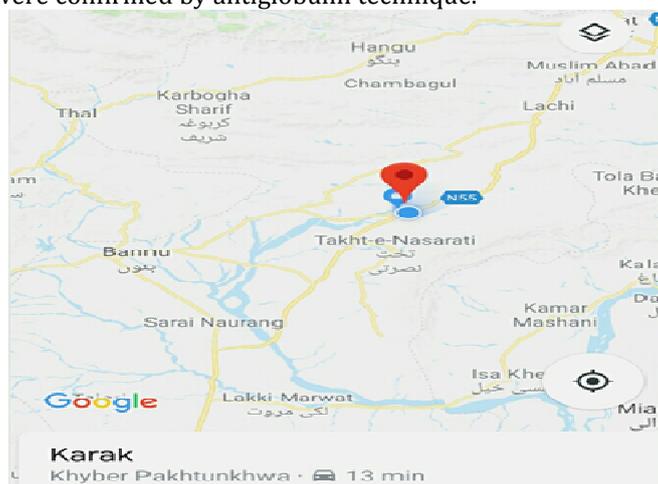
Nineteen blood groups systems are discovered and above 200 antigens have been identified in man [6]. However, the ABO and Rh blood groups are the most important blood groups so far. All the Individuals are divided into 4 major blood groups namely A, B, AB and O groups depends on the antigen present on their RBCs [7-8]. Also the human red blood cells contain antigen D are considered as Rhesus positive (Rh+) while those without antigen D are Rhesus negative (Rh-) [7]. The distribution of ABO blood groups have been shown to work as a strong predictor of national suicide and homicide rates [9-10]. Human blood groups have common association with different diseases [11] for example people with blood group O usually suffer from peptic ulcer[12] women with blood group A have high risk of endometrial and ovarian cancers more frequently than women with non-A blood groups [13]. People with group A usually have increased risk for coronary heart disease (CHD [14]. ABO blood groups and Rh factor also act as a genetic marker for obesity [15].

The present study was conducted for the purpose to assess the prevalence of blood groups and Rh factors in the whole district Karak and to compare our results with other studies conducted in Pakistan and elsewhere in the world and its multipurpose future utilities for the health planners.

## MATERIAL AND METHODS

The present research was completed in the duration of 4 months started from 1st February to 1st June over that period total of 402 female blood groups were checked aging from 18 to 28 years. Donor's name, age, occupation, complete postal address and contact number was taken so that they must be recalled whenever we need them in our next research work. The blood sample were taken with the will of female and they were told before the blood checking that we are going to conduct research on data collected from you people and those who refused we haven't checked their blood groups so to full fill our duty of ethics.

The blood sample were taken through many ways as per the interest of a female most were checked through the standard procedures of venipuncture and subjected to determination of ABO and Rhesus blood group using antisera others methods are finger prick, sterile lancet or by sterile syringes and all the samples of donors was tested for ABO and Rhesus status. After blood sampling, ABO and Rh typing was checked by antigen antibody agglutination test by available standard antisera's i.e. anti A, anti B and Anti D after validation at blood bank. Blood groups were done by slide agglutination method. Doubtful cases were confirmed by tube agglutination method and reverse grouping using known pooled A and B cells. Rh negative blood groups were confirmed by antiglobulin technique.



**Figure 2:** District Karak View from Google map

## RESULTS AND DISCUSSION

The present study was done to find out the relative abundance of blood groups in district Karak female because such work was done yet on the mentioned topic.

Total of 402 samples were checked out of that B+ was find out to be the most abundance followed by O+, A+ and AB+. On Rh basis the Rh positive have clear dominancy over Rh negative that as out these 402, 387 were found Rh positive and only 15 were Rh negative with percentage of 96.3 and 3.4 respectively. Out of these 402 samples A/A- are 88/5, B/B- are 125/6, AB/AB- are 61/1 and O/O- are 120/3 with percentage of 21.9/1.2, 31.1/1.5, 15.2/0.2 and 28.1/0.7 respectively according to the above arrangements. The present trend here is B>O>A>AB, this is a usual trend in asian countries in some

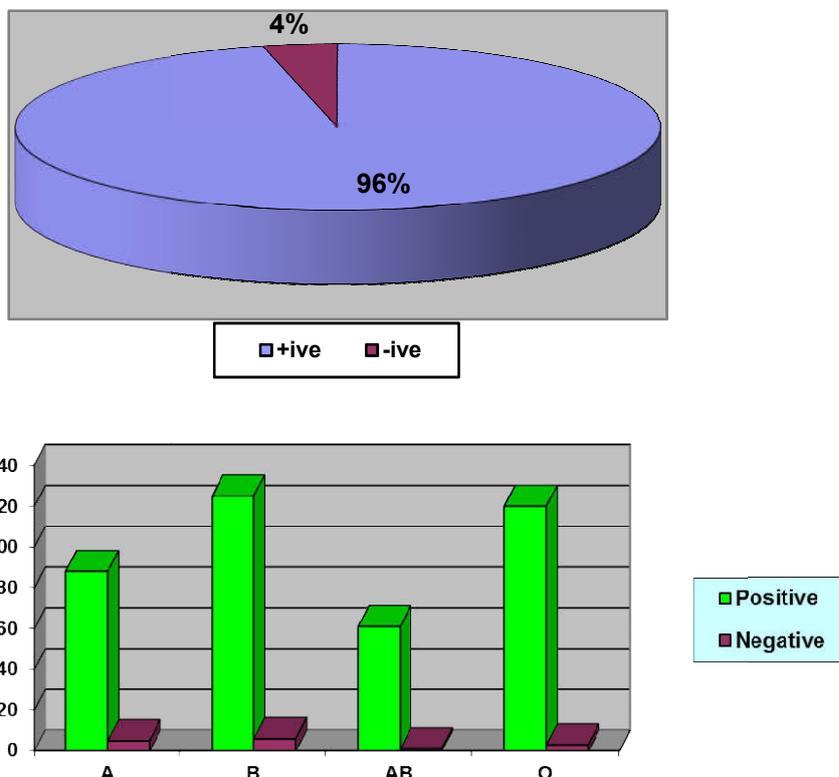
region the blood group O is leading all but in most usual cases B is ahead of all. A different trend of blood groups i.e. A>B>O>AB have been reported in Sakardu by [16-17] found a fairly high frequency of blood group A and surprisingly very low frequencies of B and O in different local tribal groups (Kafirs, Kalash, Chitrali) in the Hindu Kush region of Afghanistan and Pakistan. These differences are because of the various factors that includes selection as a result of mother-child compatibility, external environment, geographical diversity, racial background and genetic variations [18-19]. In our work we have Rh negative frequency only 4%, other work in Pakistan also shows a very low Rh negative frequency (7.97%) in studies carried out in Azad Jammu & kashmir (10.5%), in Bannu (10.8%) [19]and Rawalpindi/Islamabad (8.7%) [20] but differs from Punjab (2.8%) [21] and even the Azad Jammu & Kashmir population as whole (2.3%) [22] By comparing our study with the study conducted in Nepal [23-24] and Saudi Arabia [25]the most common blood groups were reported as B, A and O respectively. Internationally blood groups O is the most prevalent blood group among the British, American, Malaysians, Saudi Arabian [26-28] and in Egypt [29]. The only population where another blood group other than group O is the most prevalent is the Turkish and Russian Federation population where blood group A is the most prevalent [30-31]. The commonest groups in Australians are O and A while in Africans B group is commonest[32].The genetic history of a person can also be find out by studying the blood groups[33].

**Table 1:** Table showing the total numbers of sample that we have checked in the whole district Karak.

| A+ / A- | B+ / B- | AB+ / AB- | O+ / O- |
|---------|---------|-----------|---------|
| 88 / 5  | 125 / 6 | 61 / 1    | 120 / 3 |

**Fig 2:** Chart shows the negative and positive percentage of the present data.

**Percentage representation of positive and negative blood groups**



**Figure 3:** Graphical representation of the above table.

**REFERENCES**

1. Rahman M, Lodhi Y. (2004). Frequency of ABO and Rhesus blood groups in blood donors in Punjab. *Pak J Med Sci*;20:315-18.
2. Lo YM, Hjelm NM, Fidler C, Sargent IL, Murphy MF. (1998). Prenatal diagnosis of fetal RhD status by molecular analysis of maternal plasma. *N Engl J Med* 339: 1734-1738.

3. Dhot PS, Nair V, Swarup D, Sirohi D, Ganguli P. (2003). Cord blood stem cell banking and transplantation. *Indian J Pediatr* 70: 989-992.
4. Lasky LC, Lane TA, Miller JP, Lindgren B, Patterson HA. (2002). In utero or ex utero cord blood collection: which is better? *Transfusion* 42: 1261-1267.
5. Wall DA, Noffsinger JM, Mueckl KA, Alonso JM 3rd, Regan DM, *et al.* (1997). Feasibility of an obstetrician-based cord blood collection network for unrelated donor umbilical cord blood banking. *J Matern Fetal Med* 6: 320-323.
6. Rehman A, Khan M. A, Ashraf M, Malik S. A, Saeed M. A, Rafique A, *et al.* (2005). ABO and Rhesus blood group. *Professional Med J.*; 12(4): 368-371.
7. Conteras M, Lubenko S. (2001). Immunohaematology: Introduction In: Postgraduated Haematology, Hoffbrand, AV, Lewis SM and Tuddenhan EGD (Eds). 4th Edition, Arnold Publishers, London, UK, 11, 164-181.
8. [8].Khan M.S, Sibtain F, Tahir F, Kazi B.M, Dil A.S, Sultan S, Deepa F, Khan F. (2004). Prevalence of Blood Groups & Rh factor in Bannu region NWFP (Pakistan). *Pak. J. Med. Res.*; 43(1):8-10.
9. Lester D. (2004). Blood types and national suicide rates. *Crisis.*;25:140.
10. Lester D. (2005). Predicting suicide in nations. *Arch. Suicide Res.*, 9: 219-223.
11. Brecher M.E, Hay S.N. (2011). ABO Blood Type and Longevity. *Am. J. Clin. Pathol.*135:96-98.
12. Alkout A.M, Blackwell C.C, Weir D.M. (2000). Increased inflammatory responses of persons of blood group O to *Helicobacter pylori*. *J. Infect. Dis.*,181:1364-1369.
13. Marinaccio M, Traversa A, Carioggia E, Valentino L, Coviello M, Salamanna S, Dragone D.C, Marinaccio L. (1995). Blood groups of the ABO system and survival rate in gynecologic tumors [in Italian]. *Minerva Ginecol.* 47:69-76.
14. Wazirali H, Ashfaq R.A, Herzig J.W. (2005). Association of blood group A with increased risk of coronary heart disease in the Pakistani population. *Pak. J. Physiol.*, 1(1-2).
15. [15].Molison P.L. (1979). *Blood Transfusion in Clinical Medicine*. 6th edition, Blackwell scientific Publications, Oxford, U.K. pp.239-666.
16. Alam M. (2005). ABO and Rhesus blood groups in potential blood donors at Skardu (Northern Areas). *Pak. J. Pathol.* 16:94-7.
17. Bernhard W. (1980). Distribution of ABO blood groups and incidence of Rh factor (D) in various ethnic groups in the Hindu Kush region (Kafirs, Kalash Chitrali). *Anthropol. Anz.*, 37(4):251-65.
18. Onde S, Kensee A. (1995). Geographic variations analysis of the ABO and Rh system in Turkey. *Gene Geograp*; 9: 211-220.
19. Khan M.N, Khaliq I, Bakhsh A, Akhtar M.S, Amin-ud-Din M. (2009). Distribution of ABO and Rh D blood groups in the population of Poonch district, Azad Jammu and Kashmir. *EMHJ.*, 15(3):717-721.
20. Bhatti F.A, Amin M. (1996). Spectrum of ABO and D blood groups of donors at Rawalpindi / Islamabad. *Pak J Pathol.*, 7(2):26-28.
21. Afzal M, Rehman Z, Hussain F, Siddiqi R. (1977). A survey of blood groups. *J. Pak. Med. Assoc.* 27(11):426-428.
22. Rashid M. 1983. Gene frequency of ABO blood groups in Azad Kashmir (M.Sc. thesis), Department of Botany, University of Peshawar, Peshawar, Pakistan.
23. Pramanik T, Pramanik S. (2000). Distribution of ABO and Rh blood groups in Nepalese medical students: a report. *East Mediterr Health J* ;6(1):156-58.
24. Frances TF.(2002). Blood groups (ABO groups). In: *Common Laboratory and Diagnostic Tests*. 3rd Edition, Philadelphia: Lippincott, p.19-15.
25. Bashwari LA, Al Mulhim AA, Ahmad MS, Ahmed MA. (2001). Frequency of ABO blood groups in Eastern region of Saudi Arabia. *Saudi Med J.*;22:1008-12.
26. Giri P.A, Yadav S, Parhar G. S, Phalke D. B. (2011). Frequency of ABO and Rhesus Blood Groups: A Study from a Rural Tertiary Care Teaching Hospital in India. *Int J Biol Med Res.*; 2(4): 988 -990.
27. Sivananthan M, Amar P.K, Che W.I. (2013). Distribution of ABO blood group and Rhesus factor among students in ASIA Metropolitan University, Malaysia. *Int J Biol Med Res.*; 4(1): 2962-2965.
28. Sarhan M. A, Saleh K. A, Dajem S. M. B. (2009). Distribution of ABO blood group and Rhesus factor in Southwest Saudi Arabia. *Saudi Med J.*; 30(1): 116- 119.
29. Bahaj AA. (2003). ABO and rhesus blood groups distribution in Hadhramout population. *Hadh Studies and Res* 4: 2-7.
30. Sari I, Ozer O, Davutoglu V, Gorgulu S, Eren M, Aksoy M. (2008). ABO blood group distribution and major cardiovascular risk factors in patients with acute myocardial infarction. *Blood Coagul Fibrinolysis* 2008; 19(3):231-4.
31. Tomilin VV, Gurtovaia SV. (1999). The incidence of finding ABO system antigens in the population of the Russian Federation. *Sud Med Ekspert* 42: 16-18.
32. Mollison PL, Engelfriet CP. (1993). ABO, Lewis, Ii and P Groups. In: *Blood Transfusion in Clinical Medicine*. (9th edn), Oxford, Blackwell Scientific Publication 150-161.
33. Sokolov R. (1993). *Why We Eat What We Eat: How Columbus Changed the Way the World Eats*, New York, Simon & Schuster 1-50.

#### CITATION OF THIS ARTICLE

A Abbas, B Abbas, S Aziz, F Ullah, W A Panhwar, A Ali, M Khalid, H Sadia, S Raza, K Akhter, W Ahmad, F Akbar, M Zeeshan, Habibullah, S Khan. Prevalence of ABO and Rh Blood Group In District Karak (Female) *Bull. Env. Pharmacol. Life Sci.*, Vol 9[2] January 2020 : 31-34