

ORIGINAL

PROF-908

ABO & RHESUS BLOOD GROUPS



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ABSTRACT... drmayubkhan@hotmail.com **Objective:** To know the prevalence of ABO and Rhesus blood groups. **Design:** Observational cross sectional study. **Setting:** Blood transfusion Center Tehsil Headquarter Hospital Liaquatpur. **Subjects and Methods:** The data of blood donors from 2001 to 2003. **Results:** Total numbers of donors studied were 1389. The commonest ABO blood group was O present in 44.56% (CL 41.97% - 47.20%) followed by B in 32.54% (CL 30.13% - 35.06%), A in 20.88% (CL 18.82% - 23.10%) and AB in 2.02% (CL 1.39% - 2.91%) donors while 90.35% (CL 88.68% - 91.80%) donors were Rh +ve and 9.65% (CL 8.20% - 11.32%) were Rh -ve. The commonest ABO +ve group was O +ve present in 40.03% (CL 37.48% - 42.69%) followed by B +ve in 30.31% (CL 27.95% - 32.78%), A +ve in 18.21% (CL 16.27% - 20.34%) and AB +ve in 1.8% (CL 1.21% - 2.66%) donors. The most common ABO -ve was O -ve present in 4.54% (CL 3.56% - 5.77%), A -ve in 2.66% (CL 1.93% - 3.66%), B -ve in 2.23% (CL 1.57% - 3.17%) donors. **Conclusion:** Blood group O is the commonest ABO blood group and 90.35% are RH +ve in this area.

Key Words: ABO blood group, Rhesus blood group, Prevalence, Blood donors

INTRODUCTION

In human beings, 19 blood groups systems with more than 200 antigens have been identified. In clinical practice common blood groups are ABO and Rh. The gene for ABO group is present on chromosome 9 while for Rh system it is on chromosome 1. The Rh system is one of the most polymorphic of the human blood groups. More than 40 different antigens have been identified, five are common known as D, C, c, E and e.

The study of blood grouping is very important as it plays an important role in genetics, blood transfusion, forensic pathology and may have some association with diseases like duodenal ulcer¹, diabetes mellitus², urinary tract infection³, Rh incompatibility and ABO incompatibility of newborn.

As blood group determination is important in clinical practice it was felt to know the prevalence of different blood groups in this area.

SUBJECTS AND METHODS

It is an observational cross sectional study. The data was collected from the record of Blood Transfusion Center Tehsil Hospital Liaquatpur. The blood groups of donors of either sex presenting from Jan 2001 to December 2003 were studied.

The blood samples were collected by finger prick in most cases but occasionally by venepuncture. ABO and Rh blood groupings were done by agglutination test using anti-A, anti-B and anti-D human sera. The donors with more than once entered in the record were included once for the study.

The Graph pad software computer program was used for statistical calculations. 95% confidence intervals was taken to define normal range.

RESULTS

Total donors included for the study were 1389. Table-I shows the details of prevalence of ABO blood grouping.

Blood group	Donors screened	Prevalence (%)	Confidence limits (95%)
A	290	20.88	18.82% - 23.10%
B	452	35.54	30.13% - 35.06%
AB	28	2.02	1.39% - 2.91%
O	619	44.56	41.97% - 47.20%

Rhesus blood group	Total donors	Prevalence (%)	Confidence limit (95%)
+ve	1255	90.35	88.68% - 91.80%
-ve	134	9.65	8.20% - 11.32%

Blood group	Total donors	Prevalence (%)	Confidence limits (95%)
A +ve	253	18.21	16.27% - 20.134%
B +ve	421	30.31	27.95% - 32.78%
AB +ve	25	1.8	1.21% - 2.66%
O +ve	556	40.03	37.48% - 42.69%
A -ve	37	2.66	1.93% - 3.66
B -ve	31	2.23	1.57 - 3.17%
AB -ve	3	0.22	0.04% - 0.67
O -ve	63	4.54	3.56% - 5.77%

DISCUSSION

In this study, the commonest ABO blood group was O followed by B and A. Most of the studies^{4,9} in Pakistan gave the same general pattern of prevalence while other studies¹⁰⁻¹² showed B to be the most prevalent blood group. But non of the studies showed A to be the most common. International studies¹³⁻¹⁵ showed the same pattern. But other studies¹⁶⁻¹⁸ showed O to be the most

prevalent, followed by A and only one study¹⁹ showed equal prevalence of O and A. Blood group B was the most prevalent in one study²⁰ while another study²¹ showed A to be the most prevalent.

In this study 90.35% donors were Rh+ve and 9.65% Rh-ve. The other Pakistani studies^{4,5,10,11,22,23} showed a prevalence of Rh-ve 4.5%-10.77% while international studies^{13-21,24} showed a prevalence of 3.33%-5.5%.

The survey carried out in the population of different cities of Pakistan (Larkana, Jamshoro, Hyderabad, Karachi) and in different ethnic groups (Abro, Noohani and schedule cast Hindus) showed there was no constant pattern except the general fashion of blood group distribution i.e. the O group had the highest frequency, A and B were in the mid and AB blood group was the least of all²⁵. The prevalence of blood groups was different in different racial/ethnic groups of USA²⁶ and different races living in Nairobi²⁷. Majeed et al¹² and Hussain et al⁴ also showed different blood groups in different ethnic groups. It may be the reason to have different blood grouping at different parts of world.

In conclusion, general pattern of ABO and Rh blood grouping in this area is nearly same as in other parts of Pakistan.

REFERENCES

1. Akhtar MN, Tayyib A, Tasneem T, Butt AR. **ABO blood group in patients with peptic ulcer disease: Association with secretor status.** Ann King Edward Med Coll 2003; 9: 238-40.
2. Qureshi MA, Bhatti R. **Frequency of ABO blood groups among the diabetes mellitus type 2 patients.** J Coll Physicians Surg Pak 2003; 13: 453-5.
3. Ziegler T, Jacobsohn N, Funfstuck R. **Correlation Between blood group phenotype and virulence properties of Escherichia coli in patients with chronic urinary tract infection.** Int J Antimicrob Agents 2004; 24(Suppl 1): 70-5.
4. Hussain A, Sheikh SA, Haider M, Rashied R, Malik MR. **Frequency distribution of ABO and Rhesus blood groups in population of Balochistan.** Pak Armed Forces Med J 2001; 51: 22-26.
5. Khichi QK, Ali SMA, Malik MA. **Prevalence of ABO and Rh (D) blood groups in Bahawalpur division.** Pak Pediatr J 2000; 24:1-2.
6. Bhati R, Shaikh DM. **Frequencies of ABO blood alleles in human population of Pakistan: Southern Sindh in Focus.** Ann King Edward Med Coll 1998; 4: 4-5.
7. Khurshid B, Naz M, Hassan M, Mabood SF. **Frequency of ABO and Rh (D) blood groups in district Swabi N.W.F.P (Pakistan).** J Sci Tech Univ Peshawar 1992; 16: 5-6.
8. Yousaf M, Yousaf N, Zahid A. **Pattern of ABO and Rh (D) blood groups distribution in Bahawalpur Division.** Pak J Med Res 1998; 27: 40-1.
9. Khaliq MA, Khan JA, Shah H, Khan SP. **Frequency of ABO and Rh(D) blood groups in Hazara division (Abbottabad).** PAK J Med Res 1984; 23: 102-3.
10. Khan MS, Subhan F, Tahir F, Mazhar Kazi BM, Saeed Dil AS, Sultan S et al. **Prevalence of blood groups and Rh factor in Bannu region (NWFP) Pakistan.** Pakistan J Med Res 2004; 43: 8-10.
11. Ghori MR, Tayyab M, Raziq F. **Frequency of ABO and Rh (D) blood groups in transfusion dependent patients.** J postgrad Med Inst 2003; 17: 177-83.
12. Majeed T, Hayee A. **Prevalence of ABO blood groups and subgroups in a population of Lahore.** Biomedica 2002; 18: 11-5.
13. Nathalang O, Kuvanont S, Punyaprasiddhi P, Tasaniyanonda C, Sriphaisal T. **A preliminary study of the distribution of blood group systems in Thai blood donors determined by the gel test.** Southeast Asian J Trop Med Public Health 2001; 32: 204-7.
14. Das PK, Nair SC, Harris VK, Rose D, Mammen JJ, Bose YN, Sudarsanam A. **Distribution of ABO and Rh-D blood groups among blood donors in a tertiary care centre in South India.** Trop Doct 2001; 31(1): 47-8.
15. Kulkarni AG, Peter B, Ibazebo R, Dash B, Fleming AF. **The ABO and Rhesus groups in the north of Nigeria.** Ann Trop Med Parasitol 1985; 79: 83-8.
16. Omotade OO, Adeyemo AA, Kayode CM, Falade SL,

- Ikpeme S. **Gene frequencies of ABO and Rh (D) blood group alleles in a healthy infant population in Ibadan, Nigeria.** West Afr j Med 1999; 18: 294-7.
17. Gaertner H, Lyko J, Lyko S. **The antigens ABO and Rh (D) in Nigeria population.** Hamdard Medicus 1994; 37 (1): 81-91.
18. Lyko J, Gaertner H, Kaviti JN, Kariithi MW, Akoto B. **Blood group systems ABO and Rh in the Kenyan population [Article in polish].** Folia Med Cracov 1992; 33(1-3): 85-92.
19. Del Peon-Hidalgo L, Pacheco-Cano MG, Zavala-Ruiz M, Madueno-Lopez A, Garcia-Gonzalez A. **[Blood group frequencies and ABO and Rh (D) incompatibilities in La Paz, Baja California Sur, Mexico] [Article in Spanish].** Salud Publica Mex 2002; 44: 406-12.
20. Bhatnagar DP, Bhutani B. **Study of blood groups and rhesus isoimmunization in antenatal cases.** Anthropol Anz 1980; 38: 148-53.
21. Pramanik T, Pramanik S. **Distribution of ABO and Rh blood groups in Nepalese medical students: a report.** East Mediterr Health J 2000; 6(1): 156-8.
22. Majeed T, Haye. **Prevalence of rhesus blood groups in a population of Lahore Pakistan.** Postgrad Med J 2002; 13: 25-7.
23. Janjua NZ, Hassan K, Bukhari K. **Prevalence of ABO and Rh (D) blood groups amongst voluntary blood donors.** J Rawal Med Coll 1997; 1: 78-80.
24. Kurexijiang T, Hamulati W, Nuermaimaiti Y, Muyasaier K, Palida Habaer R, Halike Y et al. **[Comparative investigation of the Rh blood type distribution between the Uygur and Han nationalities in the Khotan area of Xinjiang Autonomous Region] [Article in Chinese].** Di Yi Jun Yi Da Xue Xue Bao 2004; 24: 447-9.
25. Bhatti R, Sheikh DM. **Variations of ABO blood groups gene frequencies in the population of Sindh.** Ann King Edward Med Coll 1999; 5: 328-31.
26. Garatty G, Glynn SA, Mc Entire R. **Retrovirus epidemiology donor study. ABO and Rh (D) phenotype frequencies of different racial/ethnic groups in the United States.** Transfusion 2004; 44: 703-6.
27. Mwangi J. **Blood group distribution in an population of patient targeted blood donors.** East Afr Med J 1999; 76: 615-8.

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