



# BLOOD BANK AND DISASTER RESPONSE SERVICES; WORK UP FOR THE EFFECTIVE MANAGEMENT

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**ABSTRACT: Objective:** Assessment and Comparison of blood group typing among male, female urban and rural population of Tehsil Hassan Abdal, District Attock, Punjab, Pakistan. **Materials and Methods:** A total of 400 healthy male, female volunteers belonging to both rural and urban areas were tested for blood group typing. **Results:** In the selected population in case of ABO blood groups A, B and O were pre dominant. In the same population in case of Rh blood groups Rh + was pre dominant. **Conclusions:** The assessment and comparison of blood groups in various subclasses of selected population can be beneficial in effective management of blood bank, swift management of disasters requiring massive blood transfusions and development of blood donor society.

**Key words:** ABO and Rhesus blood group system

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## INTRODUCTION

Blood one of the most vital component of human body, its synthesis starts in intra – embryonic life in yolk sac initially and Bone marrow in adult life<sup>4</sup>. Transportation role is played by the blood<sup>4</sup>. Plasma and Cells (mainly RBC, WBC and platelets) constitutes the blood<sup>3</sup>.

There are specific chemical markers (polysaccharide in nature) on the cell membrane of RBCs known as Agglutinogens<sup>1,2</sup>. These antigens are known to initiate specific immune response (antibody production)<sup>5, 27,30</sup>. For safe blood transfusion checking out the antigenic compatibility of both donor and recipient is required<sup>14,27,28</sup>.

Presently approximately 20 different blood groups and 400 antigens have been discovered, the most important among them is ABO and Rh blood group antigens discovered by Karl Landsteiner<sup>4,6</sup>. He also discovered that blood groups can be identified by using specific antisera<sup>7</sup>.

With the advent of monoclonal antibodies and

automation of tests has led to considerable improvement in blood grouping<sup>5,8,9</sup>. Manual method of blood typing is the most cost effective and helpful at places which lack advanced automation<sup>5,9</sup>. The antigenic markers are helpful in the paternity test, transplantation studies and association with different disease like coronary artery disease, diabetes mellitus and infertility is being studied<sup>14,26-29</sup>.

## MATERIAL AND METHOD

### Setting

A free medical camp was arranged at THQ Hospital Hassan Abdal to conduct the study regarding blood typing.

### Design

It is a randomized controlled experimental study conducted on male and female volunteers.

### Sample Size

A total of 400 healthy male, female volunteers belonging to both rural and urban areas were tested for blood group typing.

**Procedural steps:** The following procedural steps are taken:

**Consent:** An informed consent was obtained.

**Recording of Bio data:** The basic bio data record on separate prescribed forms.

**Sampling:** A 2ml sample was drawn from the antecubital vein from each subject in a disposable syringe and transferred immediately to a tube containing ethylene diamine tetra acetic acid (EDTA).

**Method for the Determination of blood group:** ABO and Rh blood group system was determined by antigen antibody agglutination test. The antisera used were obtained from Cenix Diagnostics (Germany). The monoclonal Anti A, Anti B and Anti AB reagents are mouse monoclonal antibodies of IgM class secreted by mouse hybridoma cell lines. For the determination of Rh factor, IgM + IgG monoclonal reagents were used<sup>9-12</sup>.

## RESULTS

The table number 01 shows the prevalence of ABO and Rh blood groups in the selected population of tehsil Hassan Abdal with gender and residential distribution. The most predominant blood group was B + followed by O +, A +, AB +, B -, O -, A - and AB -. The overall distribution of blood groups

shows 28%, 26.75%, 25.75%, 10.25%, 5.5%, 1.75%, 1.5% and 0.5% of B + followed by O +, A +, AB +, B -, O -, A - and AB - respectively.

## DISCUSSION

This study regarding blood typing is first of its kind that is being conducted in tehsil Hassan Abdal. Unfortunately no other such study has been conducted in the same area, so, no comparative data available in literature of same area.

In the present study the most predominant blood group detected was B +, followed by O +, A +, AB +, B -, O -, A - and AB -. Among the rural males the predominant blood group was A + and B +. In urban males predominant blood group was A +. Among the rural females the predominant blood group was O +. In urban females predominant blood group was B +. Overall predominance of blood group in male population was A +. In case of female population the predominance of blood group was O +.

Similar researches conducted in various parts of Pakistan as listed in table No. II shows similarity of results with the present study. In Punjab there is predominance of blood group B, this study also shows predominance of blood group B. The overall trends of the studies shown in table No. II indicate overall predominance of Rh + blood group<sup>15-18,20,22-25</sup>.

Blood groups									
Population characteristics	A+	B+	O+	AB+	A-	B-	O-	AB-	Total
Rural males	41	41	39	18	3	5	2	-	149
Urban Males	19	18	12	9	-	5	1	1	65
Total Male	60	59	51	27	3	10	3	1	214
Rural Female	28	36	42	11	1	8	3	-	129
Urban Female	15	17	14	3	2	4	1	1	57
Total Female	43	53	56	14	3	12	4	1	186
Total Male & Female	103	112	107	41	6	22	7	2	400
Percentage Distribution	25.75	28	26.75	10.25	1.5	5.5	1.75	0.5	100

Table-I. Prevalence of ABO And Rh Blood Groups In Selected Population

Population	A	B	O	AB	Rh +	Rh -
Punjab	22.4	32.4	30.5	8.4	93.0	7.0
Baluchistan	21.12	34.32	37.07	7.59	94.75	5.25
Sindh	25.00	36.00	36.00	9.00	91.80	8.20
Peshawar	28.00	34.00	31.00	7.00	94.60	5.40
Liaquatpur	20.88	35.54	44.56	2.02	90.35	9.65
Skardu	30.62	26.80	26.60	15.98	94.83	5.17
Swat	27.92	32.40	29.10	10.58	90.0	10
Rawalpindi – Islamabad	25.53	33.33	10.04	31.10	92.45	7.55
Bannu	31.03	36.23	25.07	7.67	89.27	10.73
Hassan Abdal	25.75	28	26.75	10.25	90.75	9.25

Table-II. Prevalence Of ABO And Rh Blood Group In Pakistan

Countries	A	B	O	AB	Rh+	Rh-
Australia	38	7	49	3	78	19
Canada	42	9	46	3	85.1	14.9
Germany	43	11	41	5	85	15
India	22.9	32	38.5	6.6	95.9	4.1
Saudi Arabia	26	18	52	4.23	93	7
United kingdom	42	10	44	4	83	17
Kenya	26	22	48	4	80.3	19.7
Nigeria	24.3	23.88	48.94	2.75	95.67	4.33
USA	42	10	44	4	85	15
Pakistan (Hassan Abdal)	25.75	28	26.75	10.25	90.75	9.25

Table-III. Prevalence Of ABO And Rh Blood Group World Wide

India	95.9
Saudi Arabia	93
Pakistan (Hassan Abdal)	90.75

Table-IV. Countries with predominance of Rh+ Blood group of More than 90%

In the neighboring country, India the second most predominant was blood group B. whereas, research data in table No. III shows that blood

group O was predominant, in all countries listed except Germany and Pakistan. In Germany Predominant blood group was A and in Pakistan there was predominance of blood group B<sup>19,22-25</sup>.

There was predominance of Rh + blood group in Pakistan as well as all countries as listed in table No. III. Countries with more than 90% predominance of Rh + blood group are India, Saudi Arabia and Pakistan as shown in table-IV<sup>17</sup>.

## CONCLUSIONS

The present study shows predominance of blood group B + in Tehsil Hassan Abdal (Pakistan). This data would enhance the services of blood bank and disaster emergency support services. Further studies can be conducted to assess the relevance of certain diseases such as coronary artery disease with blood groups of the same area.

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Insanity is doing the same thing,  
over and over again,  
but expecting different results  
Everyone thinks of changing the world,  
but no one thinks of changing himself.

Leo Tolstoy

