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 predominant. In the same population in case of Rh blood groups Rh+ was predominant. 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

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. Transportation role is played by the blood. Plasma and Cells (mainly RBC, WBC and platelets) constitutes the blood.

There are specific chemical markers (polysaccharide in nature) on the cell membrane of RBCs known as Agglutinogens. These antigens are known to initiate specific immune response (antibody production). For safe blood transfusion checking out the antigenic compatibility of both donor and recipient is required.

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. He also discovered that blood groups can be identified by using specific antisera.

With the advent of monoclonal antibodies and automation of tests has led to considerable improvement in blood grouping. Manual method of blood typing is the most cost effective and helpful at places which lack advanced automation. 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.

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.

**RESULTS**
The table number 0I 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.

<table>
<thead>
<tr>
<th>Blood groups</th>
<th>A+</th>
<th>B+</th>
<th>O+</th>
<th>AB+</th>
<th>A-</th>
<th>B-</th>
<th>O-</th>
<th>AB-</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural males</td>
<td>41</td>
<td>41</td>
<td>39</td>
<td>18</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>-</td>
<td>149</td>
</tr>
<tr>
<td>Urban Males</td>
<td>19</td>
<td>18</td>
<td>12</td>
<td>9</td>
<td>-</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>65</td>
</tr>
<tr>
<td>Total Male</td>
<td>60</td>
<td>59</td>
<td>51</td>
<td>27</td>
<td>3</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td>214</td>
</tr>
<tr>
<td>Rural Female</td>
<td>28</td>
<td>36</td>
<td>42</td>
<td>11</td>
<td>1</td>
<td>8</td>
<td>3</td>
<td>-</td>
<td>129</td>
</tr>
<tr>
<td>Urban Female</td>
<td>15</td>
<td>17</td>
<td>14</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>57</td>
</tr>
<tr>
<td>Total Female</td>
<td>43</td>
<td>53</td>
<td>56</td>
<td>14</td>
<td>3</td>
<td>12</td>
<td>4</td>
<td>1</td>
<td>186</td>
</tr>
<tr>
<td>Total Male &amp; Female</td>
<td>103</td>
<td>112</td>
<td>107</td>
<td>41</td>
<td>6</td>
<td>22</td>
<td>7</td>
<td>2</td>
<td>400</td>
</tr>
</tbody>
</table>

Table-I. Prevalence of ABO And Rh Blood Groups In Selected Population
In the neighboring country, India the second most predominant blood group was B. However, 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.

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.

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.
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