Frequency and Distribution of ABO and Rh (D) Blood Groups among the Bengali Muslims of Cachar District of Assam, India

A. F. Gulenur Islam Barbhuiya, Mofidur Rahman and Sheikh Abdullah Ahmed

1Assistant Professor, Department of Anthropology, Moinul Hoque Choudhury Memorial Science College, Hailakandi, Assam, India
2Assistant Professor, Department of Arabic, Dhubri Girls College, Dhubri, Assam, India
3Assistant Professor, Department of Arabic, Halakura College, Dhubri, Assam, India

ABSTRACT: Present paper documents the frequency and distribution of ABO and Rh (D) blood groups among the Bengali Muslims of Bhaurikandi Part-II village of Cachar District of Assam. ABO and Rh (D) blood grouping of 334 individuals have been done by open slide technique using anti-A, anti-B and anti-D sera. The results revealed that the commonest blood group is O followed by B, A and AB with an allele frequency of p_c (0.1421), q_c (0.1888) and r_c (0.6691). Only 5 (1.5%) Bengali Muslims are found to be Rh negative and the allele frequency of rh (d) in the population is 0.0150.

KEY WORDS: ABO Blood Group, Rh (D) Blood Group, Bengali Muslims, Cachar, etc.

INTRODUCTION
Blood is considered as one of the essential tools for understanding the ethnic origin of people and for blood transfusion. The blood groups have a distinct hereditary mechanism that are suitable for measuring the biological variability in terms of traits as they are not subjected to environmental influence (Ara et al., 2011).

The most well known and medically important blood types are in the ABO blood group system due to their importance in human blood transfusion. ABO blood group system was identified by Karl Landsteiner in 1900 after reporting series of tests (Nazarabadi et al., 2012). There are two antigens and two antibodies that are mostly responsible for the ABO blood types of ABO system. According to the presence of these antigens and antibodies blood is divided into four major groups called A, B, AB and O. Rh system emerged as second most important blood group system due to haemolytic disease of newborn and its importance in subsequent transfusions of RhD negative individuals once they develop Rh antibodies (Dennis et al., 1998). People are termed as Rh-positive or Rh-negative on the basis of presence or absence of RhD antigen on the surface of their erythrocytes.

OBJECTIVE
The objective of the present work is to study the frequency distribution of ABO and Rh (D) blood groups among the Bengali Muslims of Cachar District.

MATERIAL AND METHODS
The present study was carried out among the Bengali Muslims of Bhaurikandi Part-II village of Sonai Block of Cachar District of Assam. Cachar district is located in the southernmost part of Assam. The people inhabiting in the district are primarily known as Sylheti Bengali (a Bengali dialect). Linguistically the Bengali Muslims belong to the Indo-European ethnic group of Caucasoid racial stock (Basu et.al. 2005). They follow community endogamy. Marriage by negotiation is the prevailing practice among them. Consanguineous marriage is also present among them. They follow the patriarchal system of family structure and agriculture is their mainstay of livelihood.

The sample was collected through house to house survey of 101 households of Bhaurikandi Part-II village. ABO and Rh (D) blood group tests were performed on the spot by following open slide technique using anti-A, anti-B, anti-D sera obtained from Tulip Diagnostics (P) Ltd. on 334 individuals out of which 159 are males and 175 are females. ABO and Rh (D) blood group test was performed on all willing individuals irrespective of their age and sex.

All Statistical Analysis was carried out by SPSS 16.0 version. Chi-square test was performed wherever required and a p value of <0.05 had been considered as significant. Calculation of allele of ABO and Rh system was done by following Bhasin & Chahal (1996).

RESULTS
It is found from the study (Table-1) that the frequency of O blood group is the highest
(44.3%) followed by B (29.3%), A (21.6%) and AB (4.8%) among the Bengali Muslims. Both males and females of the community show a similar sequential order (AB<A<B<O) and chi-square test does not reveal any significant statistical difference between ABO blood group of males and females. It is observed from the existing frequencies of $p_c$ (0.1421), $q_c$ (0.1888) and $r_c$ (0.6691) alleles that $r_c$ has the highest frequency among the Bengali Muslims.

### Table-1: ABO Blood Group among the Bengali Muslims of Cachar District, Assam

<table>
<thead>
<tr>
<th>Sex</th>
<th>ABO Blood Group</th>
<th>Total</th>
<th>Chi-Square</th>
<th>Allele Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>AB</td>
<td>O</td>
</tr>
<tr>
<td>Male</td>
<td>32</td>
<td>47</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>%</td>
<td>20.1</td>
<td>29.6</td>
<td>3.1</td>
<td>47.2</td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
<td>51</td>
<td>11</td>
<td>73</td>
</tr>
<tr>
<td>%</td>
<td>22.9</td>
<td>29.1</td>
<td>6.3</td>
<td>41.7</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>98</td>
<td>16</td>
<td>148</td>
</tr>
<tr>
<td>%</td>
<td>21.6</td>
<td>29.3</td>
<td>4.8</td>
<td>44.3</td>
</tr>
</tbody>
</table>

### Table-2: Rh (D) Blood Group among the Bengali Muslims of Cachar District, Assam

<table>
<thead>
<tr>
<th>Sex</th>
<th>Rh (D) Blood Group</th>
<th>Total</th>
<th>Chi-Square</th>
<th>Allele Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td></td>
<td>$d^{(\sqrt{dd})}$</td>
</tr>
<tr>
<td>Male</td>
<td>157</td>
<td>2</td>
<td>159</td>
<td>0.0126</td>
</tr>
<tr>
<td>%</td>
<td>98.7</td>
<td>1.3</td>
<td>100.0</td>
<td>0.0171</td>
</tr>
<tr>
<td>Female</td>
<td>172</td>
<td>3</td>
<td>175</td>
<td>0.0182</td>
</tr>
<tr>
<td>%</td>
<td>98.3</td>
<td>1.7</td>
<td>100.0</td>
<td>0.0150</td>
</tr>
<tr>
<td>Total</td>
<td>329</td>
<td>5</td>
<td>334</td>
<td>0.0182</td>
</tr>
</tbody>
</table>

The Rh (D) blood group (Table-2) distribution shows the predominance of Rh positive blood group (98.5%) among the Bengali Muslim population. The present distribution of Rh positive and Rh negative blood groups show slight difference between males (98.7%; 1.3%) and females (98.3%; 1.7%) with the predominance of Rh positive group. Chi-square test doesn’t reveal any significant difference between the two sexes with regard to Rh (D) blood group. Allele frequency for D is found to be 0.9850 in the population.

**DISCUSSION**

The ABO blood group distribution varies greatly in different geographical and ethnic groups of India (Bhasin et al., 1994; Bhasin & Walter, 2001). It is found from the study that the frequency of O blood group is the highest (44.3%) followed by B (29.3%), A (21.6%) and AB (4.8%) among the Bengali Muslims. Almost similar findings have also been reported from the same geographical area by Chakraborty (2010) among the Bengali Muslims (O-40.0%, A-25.0%, B-28.0%, and AB-7.0%) and Bengali Hindus (O-36.0%, A-27.0%, B-29.0%, and AB-8.0%) of Barak Valley. The results of this study is also comparable to the earlier research (ABO blood group phenotypic frequency: O>B>A>AB) by Dewan (2015) among the Bengali Population of Rangamati district of Bangladesh which has a border sharing with Tripura and Mizoram of India.

Studies conducted on ABO blood group distribution from the northern or western part of India documented blood group B as the most frequent and O as the second most common blood group (Chandra & Gupta, 2012; Patel et al., 2012; Sidhu, 2003; Wadhwa et al., 1998). Research from central part of India also documented B as the most common followed by O blood group (Gupta & Dadwal, 2012). Some of the previous researches from southern part of India described O as the most common and B as the second most frequent blood group (Das et al., 2001; Girish et al., 2011; Periyavan et al., 2010; Reddy & Sudha, 2009). Similar findings were also put forwarded by scholars from the eastern part of India (Nag & Das, 2012). The findings of the present study are also in conformity with these earlier findings on ABO blood group distribution.

The blood group O is very common around the world among the four blood groups of ABO system (Soram et al., 2014). In the present study also individuals having O blood group is found to be the highest among all the other remaining ABO blood groups. The allele of O blood group is also found to be the highest over A and B. The allele of O blood group is recessive either to the allele of A or B blood group. Bengali Muslims of the present study follow community
endogamy and also practice consanguineous marriage. So, the practice of community based endogamous marriage along with consanguinity may have resulted in the homozygosity of allele of O blood group. Such an occurrence of higher blood group O frequency in the present study has also supported the research work conducted among the Manipuri Muslims who are strictly endogamous (Shah & Singh, 1986).

The majority of the people in the world have the Rh positive blood group (Soram et al., 2014). Earlier researches carried out on Rh (D) blood group from different parts of India documented 2.0 to 6.0% of Rh negative blood group (Chandra & Gupta, 2012; Das et al., 2001; Girish et al., 2011; Gupta & Dadwal, 2012; Nag & Das, 2012; Patel et al., 2012; Periyavan et al., 2010; Reddy & Sudha, 2009; Sidhu, 2003; Wadhwa et al., 1998). Predominance of Rh positive blood group is noticed among the Bengali Muslims of the present study. Incidence of Rh negative blood group is 1.5% among the Muslims.

CONCLUSION

The study reveals that the frequency of O blood group individuals are found to be the highest among the Bengali Muslims with a sequential order O>B>A>AB. Predominance of Rh positive blood group is noticed in the population group of the present study.

ACKNOWLEDGEMENTS

Authors are thankful to Jaidul Alom Barbhuiya, Nurul Islam Mazumder and Sabanaz Barbhuiya of Bhaurikandi Part II village for their kind co-operation and help while conducting the field work.

REFERENCES


