

## Original Research Article

# Blood group and its relationship with bleeding time and clotting time- an observational study among the 1<sup>st</sup> MBBS students of Gauhati medical college, Guwahati

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### ABSTRACT

**Background:** Blood group and its relation to bleeding time (BT) and clotting time (CT) is important in conditions like epistaxis, thrombosis, and surgery. Earlier studies depicted O group having prolonged BT and CT. The aim of this study was to assess the relationship of BT and CT with ABO groups.

**Methods:** This cross-sectional study was conducted in the department of physiology, Gauhati medical college. The study included 154 students. Blood grouping was determined with the standard antiserum; BT and CT were estimated by the duke method and slide method, respectively. Blood group and its relation to BT, CT were analyzed by Chi-square analysis.

**Results:** Blood group O (42.2%) was predominant in both genders followed by B (31.8%), A (21%), AB (4.5%). CT was found to be more than 6 minutes in group O (31.57%) followed by group AB (26.31%), A and B (21.05%). The difference was statistically significant ( $p = 0.02$ ). BT was found to be more than 4 minutes in group O (82.35%) followed by A (11.76%), B (5.88%), and AB (0%). That was statistically significant ( $p = 0.01$ ). CT was more than 6 minutes in 57.89% in females as compared to 42.10% in males, variation was statistically significant ( $p = 0.01$ ). BT was more than 4 minutes in 58.82% females as compared to 41.17% in males. The variation was statistically significant ( $p = 0.03$ ).

**Conclusions:** In present study blood group O was more common followed by B, A, and AB. CT and BT were prolonged in O group. BT and CT were more in females than males.

**Keywords:** Blood group, Bleeding time, Clotting time

### INTRODUCTION

Blood group plays a vital role in the field of medicine. There is a clear association between ABO blood group status and von Willebrand factor. Deficiency of vWF leads to hemorrhagic disorders, while elevated levels are a risk factor for thrombosis. Earlier studies state that the O group individuals have prolonged bleeding time and clotting time. In the year 1900 scientist Karl Landsteiner identified the ABO system of blood group which was the

starting of blood banking and transfusion medicine. The ABO system consists of complex carbohydrate molecules.

The A and B glycosyltransferase encoded by A and B alleles converts H antigen into A and B determinants. This transferase enzyme is deficient in the group O individuals who continue to express H antigen.<sup>1</sup> Many diseases are found to be associated with blood groups for e.g. duodenal ulcer, diabetes mellitus, urinary tract

infection, fetomaternal incompatibility etc.<sup>2-4</sup> We have taken up this study to find out if there is any definite relationship between blood group to BT and CT among the students of 1<sup>st</sup> MBBS and paramedical students of Gauhati medical college, Guwahati, Assam, India.

According to Mourner AE et al and Qureshi MA et al., there is a clear association between ABO blood group status and Von Willebrand factor.<sup>5,6</sup> Von Willebrand factor is a large glycoprotein produced by endothelial cells and megakaryocytes. Its major function is haemostasis. Deficiency of vWF leads to hemorrhagic disorders, while elevated levels are a risk factor for thrombosis.<sup>7-9</sup>

As per the study conducted by Gill JC et al, Group O individuals had lowest plasma vWF levels and non O groups (A, B and AB) had elevated levels of plasma vWF.<sup>10</sup> They state that there is increased thrombotic risk among the non O group individuals. This refers to increased bleeding time and clotting time among O group compared to the non O group individuals.

At the same time Daniel M et al in his study, could not find any association between ABO group and von Willebrand factor.<sup>11</sup>

Earlier it has been reported that blood group O was over represented in Caucasian patients admitted with epistaxis, compared with the Caucasian population in general.<sup>12</sup> One study revealed that bleeding time was significantly longer in people with blood group O than people with non-O blood group and this could not be correlated with sex ratio, platelet count or haematocrit.<sup>13</sup>

It is also suggested by authors that blood group O is associated with lower expression of Von Willebrand factor causing a relative bleeding tendency but other workers could not find out any association between the level of Von Willebrand factor and bleeding time.<sup>14-16</sup> Aims and objectives of this study was to find out -

- To find out if there is any definite relationship between ABO blood groups with bleeding time and clotting time among the 1<sup>st</sup> year MBBS students
- To find out if there is any definite relationship between Rh status with bleeding time and clotting time among the 1<sup>st</sup> year MBBS students.

## METHODS

This observational study was conducted in the department of physiology in Gauhati medical college, Assam, India. In our institution, it is mandatory for all the medical students to do their blood grouping, bleeding time and clotting time during their 1<sup>st</sup> year of study. The age group of the students are 17 to 24 years. The available detail reports of 154 students over duration of one year was analyzed in respect of ABO blood group, Rh, bleeding time and clotting time.

ABO and Rh Blood group determination was done by simple agglutination method, by mixing the sample of blood with antisera A, B and D, looking for clumping of RBCs under the microscope. Bleeding time was estimated by Duke method and clotting time was estimated by slide method.

Statistical analysis was carried out using Graphpad Instat Ver3. The Chi-square analysis was applied to examine relation between blood groups and BT, CT; p-value of <0.05 was considered to be statistically significant.

## RESULTS

In the present study, 154 students ranging from the age groups of 17 to 24 years were involved. Out of 154 students, 59 were female and 95 were male. Data were analyzed and results showed that blood group O (42.2%) was more predominant, followed by blood groups B (31.8%), A (21%) and AB (4.5%). Table 1 also shows that the blood group O (42.2%) was more common followed by blood group B (31.8%), A (21%), and AB (4.5%).

**Table 1: Gender-wise distribution of ABO blood group.**

Gender	N (%)				Total
	A	B	AB	O	
Female	12 (20.83)	15 (27.08)	8 (12.50)	24 (39.58)	59 (32.00)
Male	15 (16.66)	34 (35.29)	5 (6.68)	41 (41.17)	95 (68.00)
Total	27 (21%)	49 (31.8%)	13 (4.5%)	65 (42.2%)	154 (100)

The distribution of CT and BT in relation to blood groups is shown in Table 2. Table 2 shows that CT more than 6 minutes maximum in number in blood group O (31.57%) followed by group AB (26.31%), group A and B (21.05%). Chi-square test performed on the data shows

statistically significant difference (p = 0.02). Table 2 also shows BT more than 4 minutes maximum in number in group O (82.35%) followed by group A (11.76%), group B (5.88%), and group AB (0%). Chi-square analysis on the data show statistically significant difference (p = 0.01).

**Table 2: Distribution of clotting time and bleeding time among ABO blood group with Chi-square analysis.**

Variables	Time (minute)	N (%)				P
		A	B	AB	O	
Clotting time	<6	23 (17.55)	45 (34.35)	8 (6.1)	55 (41.98)	0.02
	>6	4 (21.05)	4 (21.05)	5 (26.31)	6 (31.57)	
Bleeding time	<4	25 (18.79)	48 (36.09)	13 (9.77)	47 (35.33)	0.01
	>4	2 (11.76)	1 (5.88)	0 (0)	14 (82.35)	

When gender-wise comparison was made it was found that CT and BT were raised in females than males, as shown in Table 3.

**Table 3: Gender-wise distribution of clotting time and bleeding time with Chi-square analysis.**

Variable	Clotting time		Bleeding time	
	<6	>6	<4	>4
Male	92 (71.75)	3 (42.10)	93 (71.42)	2 (41.17)
Female	55 (28.24)	4 (57.89)	56 (28.57)	3 (58.82)

Table 3 shows that the CT is more than 6 minutes in 57.89% in females as compared to 42.10% in males, this variation was statistically significant ( $p = 0.01$ ). Table 3 shows the BT is more than 4 minutes in 58.82% in females as compared to 41.17% in males. This variation was statistically significant ( $p = 0.03$ ).

## DISCUSSION

The present study was carried out with 154 students of age of 17 to 24 years, and it was found that the predominant blood group in current study was blood group O (42.2%) followed by blood group B (31.8%), A (21%) and AB (4.5%). Most of subjects having more than 6 minutes clotting time was in O blood group in comparison to other groups of ABO system ( $p = 0.02$ ). Most of subjects having more than 4 minutes bleeding time in O blood group in comparison to other groups of ABO system ( $p = 0.01$ ). Clotting time and bleeding time were prolonged in female in comparison to male significantly.

In present study, it was found that prolonged BT in O group followed by A, B, and AB, the difference is statistically significant ( $p < 0.05$ ). In this study, CT was prolonged in blood group O followed by AB and A = B significantly ( $p < 0.05$ ). When gender-wise comparison was made it was observed that there was higher BT and CT in females as compared to males, this variation was statistically significant ( $p < 0.05$ ).

Female individuals having comparatively more bleeding time and clotting time may be due to the presence of hormone oestrogen, which lowers the plasma level of fibrinogen and increase the clotting time.<sup>17</sup> In this study the sample size was less. Further research should be

performed with larger sample size. In this study only ABO blood group was considered. Analysis with other blood group system may also necessary.

Plasma vWF levels should be estimated to rule out any reasons for the difference clotting and bleeding time among ABO blood groups, so that preventive measures could be adopted as soon as possible.

## CONCLUSION

In this study, blood group O was the most common group while blood group AB was the least common group. CT was > 6 minutes and BT was > 4 minutes maximum in number in blood group O. Gender-wise BT and CT were higher in females than males. In this study, we concluded that O blood group females are prone to certain diseases like epistaxis and thrombosis.

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