

Original Research Article

The Relationship between Blood Groups and Clotting Time and Bleeding Time

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Abstract: The present research is to be related with the students of the undergraduate study of University of Mosul college of Physical Education and Sports sciences. The study has been conducted during September, 2025 in the Animal Physiology Lab. The total number of the subjects of the study was 107 female and 68 male students aged between 18-21 years, enrolled in undergraduate course. Students blood typing and association with hemostatic parameters, such as bleeding and clotting time were studied. In both sexes blood-group typing was performed and bleeding time (BT) and clotting time (CT) were determined. Results of the study showed that the blood group B was the commonest blood group. The ABO blood groups are as follows: The bleeding and clotting time of O blood group is the longest. Based on the above data, it may be inferred that there could be a correlation between the two blood groups ABO and the above two tests (bleeding time and clotting time) in the study population.

Keywords: Blood Groups, Clotting Time, Bleeding Time.

INTRODUCTION

Initially blood was considered to be one homogeneous, biological substance, but in more recent times, new discoveries were made in hematology that human blood RBCs differed in terms of their surface antigenic properties from one person to another. The principle blood group system is A, B, AB and O, among all the blood group systems ABO blood group system is the most important and most used. "The classification is essentially dependent on the presence or absence of A & B antigens on the surface of erythrocytes and in presence or absence of A & B antibodies in blood plasma" [1, 2]. Thus this would mean that blood group A have anti-B antibodies, blood group B would have anti-A antibodies, blood group AB would have none of the antibodies and blood group O would have both anti-A and anti-B antibodies. One of the greatest advances in the understanding of blood compatibility, blood transfusion and blood group systems was Karl Landsteiner's discovery of the ABO blood group system in 1900 [3, 4]. Since then ABO blood group system have become an important issue in the clinical practice especially in blood transfusion, surgical operations, transplantation of organs etc., where it is important to prove the compatibility of the blood group of two persons. Even though the ABO blood group system can be used for more than its clinical applications as a genetic-biological marker [5], it has been studied.

Some blood groups have been associated with the incidence of some diseases. The presence of some Blood Group association have been reported in several studies associated with some diseases. "The influence of gastrointestinal diseases like gastric and duodenal ulcer, urinary tract infection and gastric cancer on variation in the distribution of blood-groups ABO has been studied" [5]. The strength and nature of these associations has been different among populations, but these results have sparked renewed interest in the possible biological mechanisms underlying associations between ABO blood groups and disease susceptibility. A von Willebrand factor (VWF) is one of the factors which could be involved in the linkage between ABO blood groups and hemostasis. This indicates that plasma VWF may be correlated with ABO blood-group as it is suggested that the plasma VWF level decreases in blood group O individuals as compared to non-O individuals [6]. VWF is a large multimeric glycoprotein, produced in the endothelial cells and megakaryocytes. It is

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essential for primary haemostasis, in relation to the adhesion of platelets to damaged blood vessels and for platelet aggregation. It also has a coagulation function as it's a coagulation factor VIII carrier and stabilizer [7].

Bleeding time (BT): The time it takes a vessel to open up and then platelets to close off the vessel and stop the bleeding. "It's a platelet adhesion process to the exposed subendothelial structures (collagen) and also adhesion of the platelets to the damaged vascular wall by using VWF to collagen" [8]. It is likely that these changes with platelets are correlated with the changes in VWF activity and bleeding time; and they can be useful in learning about primary hemostasis.

Clotting time (CT), on the other hand, is the time taken to create a fibrin clot that is stable when blood is stimulated to clot. Formation of fibrin strands is the last precursory stage before the formation of stable, nonlabile blood clot, and is an important stage in the process of blood coagulation preventing further blood loss [9]. The bleeding time has been reported to vary from approximately 1 to 5 minutes, and the clotting time from approximately 2 to 6 minutes, depending upon the methods used for the examination of the blood and the procedure in the laboratory. Because of the physiological role of the ABO blood group system, its possible relationship with VWF and hemostasis, many investigations have been carried out to analyze the relationship between bleeding and clotting time with ABO blood group system. Awareness of these relationships could shed light on the differences between these blood groups in their physiology and how this could impact hemostasis and clinical practice [10].

In this study, 175 health students of physical education college - University of Mosul, ages range between [18-21], years old were chosen. Under sterile conditions blood was drawn as in a finger prick, the average clotting time was compared with the average bleeding time and the blood type was also compared with the Duke method (agglutination method) and the blood type was determined by checking the filter paper under the microscope until the appearance of bloodstains was no longer observed and the average bleeding time was 1.5-5 minutes. The clotting time was determined by making a deep skin puncture with sterile lancet. The first drop of blood was discarded and the blood was put in the capillary tube. The tube is then broken at 30-second intervals (this will vary according to the capillary action) leaving a gap between each break (1-2cm) which are the fibrin strands. Then timed using a Timer and should take 2-6 minutes and normally it would be the average.

Statistical Analysis

Microsoft Excel spreadsheets and the Statistical Package for the Social Sciences (SPSS), version 16.0 were used for statistical analysis. The data were analysed at 5% level of significance with the result being significant if the p value obtained was less than 0.05 ($P < 0.05$). In contrast, data not as low as $p < 0.05$ were considered to be "no significance."

RESULTS

A total of 175 students (Males (68) & Females (107)) were analyzed. In table (1) and chart (1), it shows that individuals with blood group B are the most common blood group followed by blood group AB, O and finally blood group A.

Table 1: The correlation of blood types between men and women

Blood Groups	Males	Females	Total	Percentage
O	21	35	56	32%
A	12	25	37	21.14%
B	31	40	71	40.57%
AB	4	7	11	6.28%
Total	68	107	175	99.99%

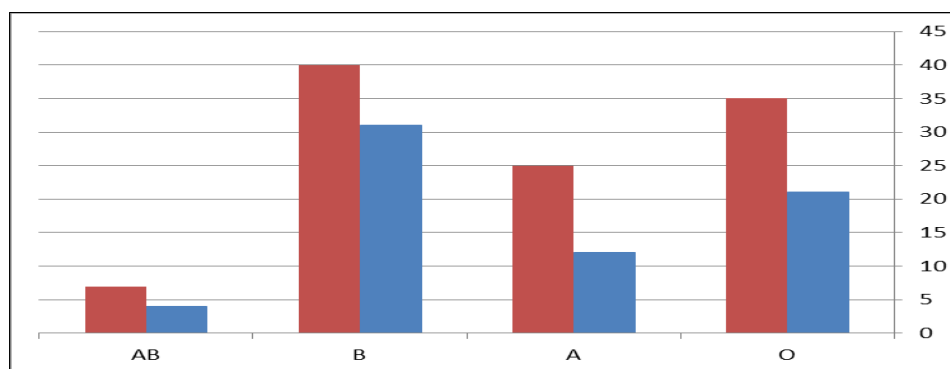


Chart 1: Depicts the correlation between blood types in men and females

The bleeding time and clotting time for each blood type (AB, O, B, and A) were analyzed. Table (2) and figure (2) illustrate that the duration of bleeding was markedly prolonged in the O blood group (>4 minutes) compared to the AB (2.2 minutes), B (2.2 minutes), and A (2.4 minutes) blood groups at a significance level of <0.05P.

Table 2: Correlation between blood types and hemostatic duration

Blood Groups	BT<4	BT>4
O	40(71.4)	16(28.6)
A	28(75.7)	9(24.3)
B	63(89.1)	8(10.9)
AB	8(72.72)	3(27.28)
Total	139	36

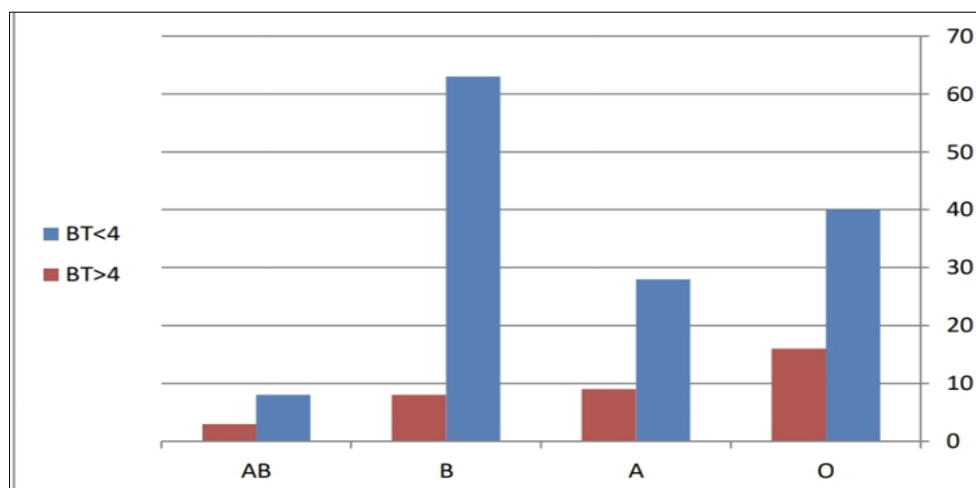


Figure 2: Illustrates the correlation between blood types and hemostatic duration.

The blood type B needed no time for the blood to clot (6 minutes and below) 100% of the time in our study. Clotting time will be longer (over 6 minutes) for other groups. As indicated in Table (3) and Diagram (3) the blood types (AB, A, B and O) takes longer to coagulate.

Table 3: Correlation between blood types and coagulation duration

Blood Groups	CT<4	CT>4
O	68(40)	18(32.1)
A	83,7(31)	6(16,21)
B	38,73(63)	11,26(8)
AB	81,81(9)	18,18(2)
Total	141	34

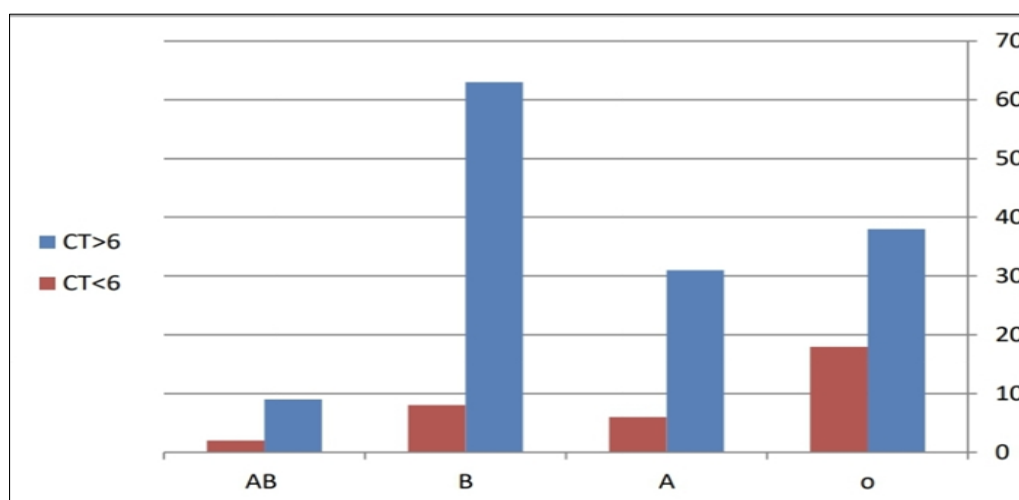


Chart 3: Illustrates the correlation between blood types and coagulation duration

DISCUSSION

Blood group, Bleeding and Clotting tests are done prior to the surgery. ABO blood typing is necessary when it is necessary to provide compatible blood/blood products. Blood group (11) might be of benefit in clinical, forensic and forensic-legal studies. Likewise, Wuyun *et al.*, 2018 reported that the population of human studied in this study was mostly blood group 'B'. The blood groups were ranked by Benjamin *et al.*, (2020) as follows AB blood group, A blood group, B blood group and O blood group. The populations studied might be influenced by other factors of demographic, genetic and geographical origin on the ABO blood group distribution. The bleeding and clotting times of blood type O were the longest blood type and that of AB, A and B were shorter as shown in Table 2.

The results indicated that there may be a correlation between the blood-group and coagulation/bleeding. Disparities will have to be assessed taking into consideration the populace studied and the approach for examining the traits. According to Bajsha *et al.*, (2020) the blood types that would take more time to bleed were the O blood types. Zour *et al.*, (2020) have conducted the study, which results showed that the blood type (O) would coagulate in less time. With this, the correlation of the results was done with ABO blood group with the hemostatic parameters bleeding time and clotting time [14].

The variations could be attributed to the protein VWF which is a protein in primary hemostasis and platelet adhesion and to the blood types ABO. The plasma VWF level in non-O blood group individual can be up to 25% higher [15], than in O blood group individual. In some type Os a longer bleeding time would occur due to the decreased level of VWF. From the findings of Monaka *et al.*, (2017) it may be inferred that non-O blood groups may have higher risk of developing thrombosis as they have higher levels of VWF. Rejio *et al.*, (2020) reported that ABO blood group has an impact on VWF levels. The present study was compared and correlated with the previous study which was done in the relationship between ABO blood-group type and hemostasis. This is because blood group O's have less VWF which may contribute to their increased bleeding time and clotting time. The results are in line with the growing body of evidence of a relationship between ABO blood-group diversity and hemostasis. These correlations would be explained by more studies with larger and diverse population groups and VWF and/or other coagulation parameters.

CONCLUSIONS

The study concluded that the blood group that is followed after ABO blood group system in the population is B blood group, followed by group O, and then groups A and AB. The blood group of O has a greater clotting time and bleeding time as compared with other blood groups. The ABO blood group may have an effect on the hemostatic properties. This difference needs to be taken into consideration along with the research population and experimental conditions in which the bleeding and clotting times were determined.

REFERENCES

1. Chimara A, Purohit P, Mahapatra B. No association of bleeding time and clotting time with four ABO blood groups in healthy young adults: an observational study. *Natl J Physiol Pharm Pharmacol*. 2019;9(12):1193.
2. Okeke CO, Okoto US, Babatunde A. Variations in coagulation time in ABO groups. *Iraqi J Hematol*. 2018;7(2):85.
3. Farzana NA, AB H, Rafiq N, et al. ABO blood groups and their coordination with bleeding and clotting time. *Pure Appl Biol*. 2018;7(4):1214-27.
4. Mehic D, Hofer S, Jungbauer C, et al. ABO blood group and bleeding severity. *Blood Adv*. 2020;4(20):5157-64.
5. Nazeer M, Aara S, Rafiq N. Blood groups, bleeding time and clotting time in students. *Int J Med Sci Clin Invent*. 2018;5(2):3553-6.
6. Gantela S, Thotakura M. Gender-based differences in bleeding time and clotting time. *J Evol Med Dent Sci*. 2017;6(91):6399-403.
7. Beloel H, Ruchard D, Drewniak N, Molliex S. Overuse of preoperative laboratory coagulation testing and ABO blood typing French national study. *BJA: British Journal of Anaesthesia*. 2017 Dec 1;119(6):1186-93.
8. Chanu LL, Singh RB, Rajkumari B, Anal SR. Bleeding time and clotting time in different blood groups: a cross-sectional study. 2019;17(4):4-5.
9. Zour S, Wu L, Chen Z, et al. Effect of ABO blood groups on response to warfarin. *Am J Med Sci*. 2020;360(1):50-4.
10. Azeez FS, Jumaa AM, Hassan HY. Bleeding Time in Different Blood Groups and Genders In Hawija Technical Institute Students.(2020).
11. Baishya R, Sarkar R, Barman B. Blood group and its relationship with bleeding time and clotting time an observational study among the 1st MBBS students of Gauhati medical college, Guwahati. *Int J Res Med Sci*. 2017; 5:4147-50.
12. Wuyum G, yu . WEN , Z . Effect of blood group factor on anticogulation with aspirin chinese Journal of Aresthesiology .2018 1493 .S.
13. Benjamin JJ, Geetha MB. Study of association of bleeding and clotting time with blood group among young adults. *Indian J Clin Anat Physiol*. 2020;7: 350-353.

14. Afifi DA, Abdelsalam EM, Makhlouf AA, Ibrahim MA. Evaluation of coagulation factors activity in different types of plasma preparations. *Indian Journal of Hematology and Blood Transfusion*. 2019 Jul;35(3):551-6.
15. Rejtő J, Königsbrügge O, Gritz E, et al. Influence of blood group on factor VIII levels. *J Thromb Haemost*. 2020;18(5):1081-6.
16. Monika G, Samer S, Yogesh G, Preeya M, Krishna Kant, P. Comparison of BT/TC with reprecet to blood group in medical students. *Tnt. Jtealth Sa. Res* 2017 : 7 .75 _8.