

Juxtaposition study of BT and CT in distinct blood group between Injured He and She

Ravi Kumar V^{1*}, Vineeta Prakash², Yashwant Giri³, Randheer Gupta⁴ and Deepak Kumar⁵

^{1,4,5}Ranchi College of Pharmacy, hatiya hesag, kutetolli, Ranchi, Jharkhand, 834003

³CUTM, Village Allure Nagar, R. Sitapur, Odisha, 761211

²Government Pharmacy Institute, Bariyatu, Ranchi, Jharkhand, 834009

⁴Glocal University, Delhi-yamunotri marg, SH 57, Mirzapur pole, Uttar Pradesh 247121

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*For Correspondence

Ravi Kumar V, Ranchi College of pharmacy, hatiya hesag, kutetolli, Ranchi, Jharkhand, India

E-mail: vaibhavkumar3085@gmail.com

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ABSTRACT

HE and SHE stand for male and female. CT and BT assess of haemostatic mechanism. Both are very importance before initiating any surgery. Blood group plays a vital function in the field of transfusion medicine, forensic pathology and genetically determined. "waterfall" and "cascade" theories-blood coagulation, fundamental principle of cascade of proenzymes leading to activation of downstream enzymes deals with arrest of bleeding, Haemostasis deals with stop of blood and thrombohaemorrhagic balance is controlled in the body by complicated interactions between coagulation and the fibrinolytic system as well as platelets and vessel wall. BT and CT is increased in female due to presence of estrogens and reduce the activity of platelets. BT is decreased in male due to increased activation and aggregation of platelets. CT is also increased in female due to increased estrogen which prolongs clotting time and decreases plasma fibrinogen level in blood. A group of 300 volunteers between the age of 18 and 32 years was taken for comparison study, at the department of physiology. Differences were statistically significant and no significant difference was observed in BT and CT in Rh+ve and Rh-ve blood group. The difference in O blood group and non O blood group was also not significant. The bleeding time was determined by Duke's method and clotting time was determined by capillary tube method. Data were analyzed using software and comparison study of mean bleeding and clotting time between males and females was completed by unpaired test. Normal BT is between 2-6 minutes and CT is between 3-8 minutes.

INTRODUCTION

Bleeding time deals with the time interval between the movement when bleeding starts and the movement when the bleeding stops due to formation of temporary platelet plug. Bleeding time is affected by platelet function and activation as well as interactions between endothelial cells in the artery, aggregation and coagulation pathways. Bleeding time and Clotting time are performed during blood transfusion, diagnosis of platelet disorders and a variety of forms of treatment in hospitals ^[1]. Prolonged bleeding time in females may be due to the differences of soft tissue, and hormonal effect on blood vessels. It involves making a patient bleed then timing how long it takes for them to stop bleeding. Historically it was indicates whenever the physician needed information about platelet activation. Introduced by Duke in 1900, which is refer to platelet evaluation test. A standardized incision is made on the volar surface of the forearm and cessation of bleeding indicate the formation of haemostatic. If the bleeding time is outside the range, it could imply an underlying platelet defect, and there should be more tests done to confirm it. An abnormal bleeding time indicates that the person could have acquired platelet function defect. An acquired platelet function defect develops after birth ^[2]. Coagulation test refers to prothrombin time which is followed by extrinsic coagulation pathway normal range 11-17s and activated partial thromboplastin time which is followed by intrinsic pathway normal range 24-38s. If the bleeding history is positive or if the surgery is likely to impair haemostasis example-cardiac surgery, then coagulation testing is recommended ^[3]. That's why both test is essential for male and female due to haemotological purpose ^[4].

MATERIALS and METHODS STUDY DESIGN and PARTICIPANTS CLOTTING TIME MATERIAL

- Capillary tubes of uniform size (non heparinized)
- A petri-dish
- Alcohol swabs
- Cotton wool
- Plasticine

Bleeding time Material

- Alcohol swab
- Filter paper
- Stop watch
- Prick on ear lobe or finger

This study was carried out in the department of physiology in Ranchi College of pharmacy hatia, Ranchi Jharkhand. A total No of one hundred and eighty injured male and female college students were participated voluntarily in the medical camp, comprising 100 males and 80 females' students. Bleeding Time was estimated by Duke Method whereas Clotting Time was estimated by Capillary Tube method^[5]. In Duke Method, a puncture is made on fingertip and the time recorded when blood first appears. The blood is carefully blotted every 30 seconds, with care begin taken that the wound site is not touched. The time is recorded when bleeding stops^[6]. The time interval from onset of bleeding to stoppage of bleeding should be reported as bleeding time. The Capillary Tube method involves collecting blood in a capillary tube that does not contain anticoagulant^[7]. The timer is started when the blood first enters the tube. The outside of the tube is carefully wiped and every 30 seconds a piece of the tube is broken. The time is recorded when a strand of fibrin appears between the two pieces of capillary tube^[8]. The purpose and procedure of the study were explained to each subject. Written informed consent was taken from all the participants.

Principle

- A standardized incision is made on the volar surface of the surface.
- Time-incision bleeds is measured.
- Cessation of bleeding indicates the formation of haemostatic plug.
- Depends on the adequate no of platelets and on the ability of the platelets to adhere to the subendothelium.

Procedure of BT and CT (A&B)

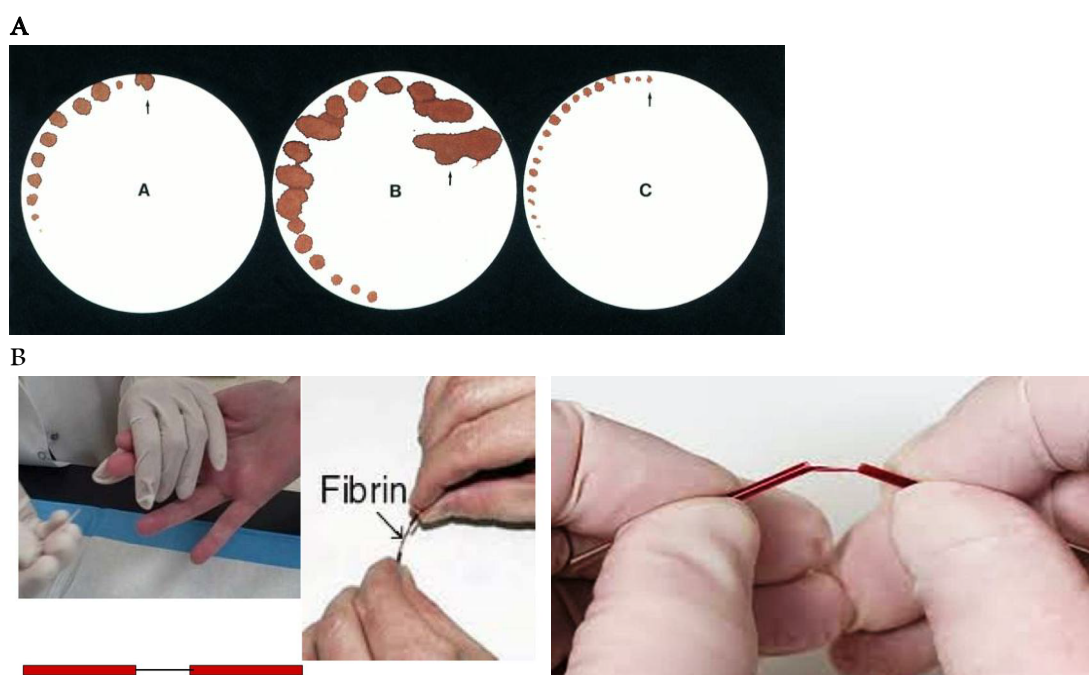


Figure 1 (A&B). Differences were statistically significant and no significant difference was observed in BT and CT in Rh+ve and Rh-ve blood group.

Clinical application

1. Thrombocytopenia
2. Platelets dysfunction
3. Medication aspirin
4. Vitamin K deficiency
5. Von willebrand disease

RESULTS

Value of BT and CT in male and female

The mean value of bleeding time in males is 96.06 ± 54.05 seconds and in females is 154.45 ± 34.91 seconds, indicates that females are having higher bleeding time than males, which is statistically significant (p value < 0.001) (**Figure 1**). The mean value of clotting time in males is 222.01 ± 50.74 seconds and in females is 318.18 ± 64.40 seconds, indicates that females are having more clotting time than males, which is statistically significant (p value < 0.001) (**Figure 2**).

DISCUSSION

Till date many studies carried out to find out the association between blood groups and bleeding time & clotting time. As stated by Massimo Franchini et al, when compared to the type O group, the non O group individuals can have an increased risk of thrombosis due to the higher levels of Vwf^[9]. He also stated that the ABO blood group can affect the vWF catabolism. It means the plasma vWF levels may depend upon blood group of the individual^[10]. Same concept was accepted by Jenkin's PO et al, who stated that vWF is 25% more in non O group individuals compared to group O individuals, meaning the CT and BT will be elevated among the O group individuals compared to the other groups. On the same field of knowledge, in our study we also tried to find out the association between blood groups and the bleeding time and clotting time^[11]. For it we reclassified blood groups in 1) Rh +ve & Rh-ve category and then 2) O blood group and Non O blood group category. We found difference in both the category with respect to bleeding time and clotting time but it was not statistically significant^[12].

CONCLUSION

I observed that bleeding and clotting time are higher in females. We recommend further detailed study in college's students. Our study also shows a trend of longer BT in females and longer CT in females, but these were not statistically significant. Hence, we suggest more studies with larger sample size to confirm the results and to understand the reasons behind these variations.

REFERENCES

1. Mahapatra B and Mishra N. Comparison of bleeding time and clotting time in different blood groups. Am J Infect Dis 2009;5(2):106-8.
2. Daniel M, et al. Is admission for epistaxis more common in Caucasian than in Asian people? Preliminary study. Clin Otolaryngol. 2006; 31:386-389.
3. Miller VM, et al. Estrogen, inflammation and platelet phenotype. Gend Med 2008; S91-A102.
4. Miller VM, et al. Estrogen, inflammation and platelet phenotype. Gend Med. 2008; 5 Suppl A:S91-S102.
5. O'Brien JR, et al. Stressed template bleeding time and other platelet-function tests in myocardial infarction, Lancet 1973; 301:694-6.
6. Roy B, et al. Blood group distribution and its relationship with bleeding time and clotting time: A medical school based observational study among Nepali, Indian and Sri Lankan students. Nepal J of Epid 2011; 1:135-140.
7. Martina E. Daly. Determinants of platelet count in humans. Haematologica. 2011; 96(1): 10-13.
8. R.L. Bijlani and S. Manjunatha. Understanding medical physiology, India, Jaypee publication, Fourth edition, 99.
9. Livio M. Uraemic bleeding: Role of anaemia and beneficial effects of red cell transfusions. Lancet 1982; 2:1013-5.
10. Lehman CM. Discontinuation of BT without detectable adverse clinical impact. Clin Chem 2001; 47:1204-11.
11. Berndt MC and Robert K. Andrews. Bernard soulier syndrome Hematologica. 2011; 96:355-359.
12. Sasekala and Saikumar MP. Relationship Between Bleeding Time And Clotting Time Among Gender Difference And Varying Blood Groups In UG Medical Students, IOSR J of Dental and Med Sci; 2013; PP 40-43.