National Journal of Physiology, Pharmacy and Pharmacology

RESEARCH ARTICLE

Comparison of bleeding time and clotting time between males and females

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Received: June 02, 2018; **Accepted:** June 17, 2018

ABSTRACT

Background: Bleeding time (BT) depends on various factors such as functions of platelets and endothelial cells of arteries and pathways of coagulation. Clotting time (CT) is increased due to the absence or abnormality of clotting factors. BT is increased in females due to the presence of estrogens which, in turn, reduce the functions of platelets. CT is also increased in females as compared to males because of increased estrogen in females which prolongs CT and decreases plasma fibrinogen level. BT is decreased in males due to increased activation and aggregation of platelets. **Aims and Objectives:** Comparison of BT and CT between males and females. **Materials and Methods:** A study was conducted at the Department of Physiology, TMMC and RC over a period of 1 year. A group of 200 volunteers between the ages of 18 and 30 years was taken for study. Of 200 volunteers, 84 were male and 116 were female. The BT was determined by Duke's method using Whatman filter paper. CT was determined by capillary tube method. Data were analyzed using SPSS software 23. The comparison of mean BT and CT between males and females was done using unpaired *t*-test. **Results:** The comparison of mean BT and CT between males and females was done using unpaired *t*-test. It was found that the mean BT and CT in males were 128.69, and 219.88 respectively. The mean BT and CT in females were 133.28 and 223.97, respectively. The mean BT ($P = 0.047$) and CT ($P = 0.046$) were more in females as compared to males. Differences were statistically significant. **Conclusion:** The present study indicates that BT and CT were significantly more in females as compared to males.

KEY WORDS: Bleeding Time; Clotting Time; Gender Differences

INTRODUCTION

Bleeding time (BT) can be defined as the time taken from the puncture of the blood vessel to the stoppage of the bleeding. Bleeding normally lasts for 2–6 min.[1] BT and clotting time (CT) are done for blood transfusion for various purposes and to diagnose various disorders of functions of platelets and clotting factors.[2]

BT depends on various factors such as functions of platelets and endothelial cells of arteries and pathways of coagulation.[3-5]

Access this article online	
Website: www.njppp.com	Quick Response code
DOI: 10.5455/ijmsph.2018.06201417062018	

CT is the time interval from puncture of blood vessel to the formation of fibrin thread. Normal value of CT is 3–8 min.[6] CT is increased due to the absence or abnormality of clotting factors.[7] CT is higher in females as compared to males.[8] This is because of increased estrogen in females which prolongs CT and decreases plasma fibrinogen level.[9] BT is increased in females due to the presence of estrogens which, in turn, reduce the functions of platelets.[10,11] BT is decreased in males due to increased activation and aggregation of platelets.[12-16] The major focus of the present investigation is to demonstrate the gender wise differences in BT and CT.

MATERIALS AND METHODS

The study was done at the Department of Physiology, TMMC and RC over a period of 12 months. A group of 200 volunteers from the western U.P population was taken for the study. Of

Table 1: The comparison of mean BT and CT between males and females (*n*=200)

Parameters	Mean±SD		Mean difference	*t*-test value	*P*
	Male	Female			
BT (s)	128.69±44.09	133.28±44.33	−4.59	−3.724	0.047*
CT (s)	219.88±50.50	223.97±57.92	−4.09	−3.519	0.046*

*P<0.05 (significant); ^>0.05 (not significant). BT: Bleeding time, CT: Clotting time

200 volunteers, 84 were male and 116 were female. Approval for the study was taken by the institutional ethical committee.

Inclusion Criteria

- Males and females between the ages of 18 and 30 years.

Exclusion Criteria

The following criteria are excluded from the study:
- Those without written informed consent.
- History of any bleeding and clotting disorder like purpura.[17]
- History of any medication causing abnormal BT and CT like NSAIDs.[17]

The BT was determined by Duke's method using Whatman filter paper.[18] CT was determined by capillary tube method.[18]

Statistical Analysis

The data were collected and analyzed using SPSS (version 23).

The comparison of mean BT and CT between males and females was done using unpaired *t*-test.

RESULTS

Of 200 volunteers, 84 were male and 116 were female. The comparison of mean BT and CT between males and females was done using unpaired *t*-test. It was found that the mean BT and CT in males were 128.69, 44 and 219.88 respectively. The mean BT and CT in females were 133.28 and 223.97, respectively. The mean BT (P = 0.047) and CT (P = 0.046) were significantly more in females as compared to males [Table 1].

DISCUSSION

The mean BT (P = 0.047) and CT (P = 0.046) were more in females as compared to males and the difference was statistically significant.

Aleemet *et al.* studied correlation of blood groups, BT, and CT in male and female students. They conducted a study on 122 students, of which 35 were male and 87 were female. Similar to our result, they found that BT and CT were slightly more in females as compared to males.[19] Reeta studied gender wise relation of BT and CT, of 154 students, 59 were female and 95 were male. They also found that BT and CT were higher in females as compared to males.[20] Roy *et al*. conducted a study in 261 volunteers; they also found higher BT and CT in females as compared to males.[2] Meena and Sunil conducted a study on 150 students. They also found that BT and CT were higher in females than males.[21] Manjeet and Arvinder conducted a study on 150 students, they found that BT and CT were higher in females than males, but the differences were statistically not significant.[22]The comparison of BT and CT between males and females shows that females have greater values of BT and CT as compared to males; it is attributed mainly to hormonal difference between males and females. Females are having higher levels of estrogen and lower levels of fibrinogen in blood plasma as compared to males. The estrogen decreases the plasma level of fibrinogen and increases the CT. It causes dilatation of blood vessels so prolongs the BT.[19]

Duke's method for BT and capillary tube method for CT though easy and inexpensive methods, but they are not very accurate methods.

The future studies can be conducted using other test methods such as estimation of prothrombin time, activated partial thromboplastin time, study of platelet aggregation, and determination of coagulation factor.

CONCLUSION

It can be concluded that BT and CT are higher in females as compared to males and the difference is statistically significant.

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How to cite this article: Adhana R, Chaurasiya R, Verma A. Comparison of bleeding time and clotting time between males and females. Natl J Physiol Pharm Pharmacol 2018;8(10):1388-1390.

Source of Support: Nil, **Conflict of Interest:** None declared.