

# A study on comparison of bleeding time and clotting time in young adult male and female subjects

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## Abstract

**Background:** Bleeding time is a laboratory test to assess the platelet function. It is dependent on various factors like function of platelets and pathway of coagulation. Clotting time is the time required for a sample of blood to clot in vitro under standard conditions. It is known from previous studies that there is a difference in the bleeding time and clotting time among males and females. The exact reasons for such differences have been postulated, but are insufficient. Therefore the aim of this study is to study and compare the gender differences in bleeding time and clotting time in young male and female subjects. **Aims and objectives:** The aim of this study is to determine and compare the differences in bleeding time and clotting time in young adult male and female subjects. **Materials and Methods:** This study was done in the Department of Physiology, Raichur Institute of Medical Sciences, Raichur. Sixty medical students studying in first year M.B.B.S, were selected for the study, out of which thirty were males, and thirty were females. Bleeding time was determined by Duke's method and Clotting time was determined by Wrights Capillary tube method. Data was analysed using SPSS software. Unpaired 't' test was used for comparing the values. p value less than 0.05 was considered significant. **Result:** The mean value of bleeding time in males was found to be, 127.69±51.02 and in females it was 133.28±44.30. The mean of the CT in males was 212.18±60 and in females it was found to be 257.16±61.00. The mean BT and CT was significantly higher in females as compared to the males. **Conclusion:** It was found that there are differences in bleeding time and time in males and females, BT and CT were statistically more in females as compared to males. **Key words:** Bleeding time, Clotting time.

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## INTRODUCTION

Haemostasis means stoppage of bleeding. Bleeding time and clotting time assess the integrity of the haemostatic mechanisms. Bleeding time and clotting time are important

investigations done before any surgical procedures, apart from other investigations like estimation of Hemoglobin levels, total leucocyte counts, differential counts, blood grouping, platelet counts, and clotting time, blood grouping etc. Bleeding time is defined as the time taken from the rupture of blood vessel to spontaneous, unassisted stoppage of bleeding. Bleeding time usually lasts for 2-6 minutes<sup>1</sup>. This depends mainly on the platelet functions like platelet adhesion and aggregation<sup>2</sup>. Clotting time is defined as the time interval between puncture of the blood vessel and formation of the fibrin threads. The normal value of clotting time is 3-8 minutes<sup>3</sup>. Any abnormality of the clotting factors or their deficiency can lead to the prolongation of the clotting time<sup>4</sup>. Studies done previously have shown that there is a difference in BT and CT in males and females. The increased platelet activation and

adhesion in males, could be the reason for the decreased bleeding time in males<sup>5</sup>. On the other hand the presence of estrogen in females reduces the platelet function in them and prolongs the bleeding time<sup>6</sup>. It also decreases the plasminogen levels, which is the reason for prolonged CT in females<sup>7</sup>. Thus the main aim of this study was to assess the BT and CT in young males and females and study the differences of the values obtained in these groups.

## MATERIALS AND METHODS

The study was done in the Department of Physiology, at Raichur Institute of Medical Sciences, Raichur. A group of sixty healthy subjects, consisting of thirty males and thirty females were taken for the study. Institutional Ethical Committee Clearance was obtained. Informed consent was taken from all the subjects. The subjects selected for the study were of age group, 18-28 years. Subjects who were non cooperative, had any history suggestive of bleeding or clotting disorders or were on medication were excluded from the study. The subjects were explained the procedure of performing the tests and were instructed to note down the values they obtained. Bleeding time was determined by Dukes method. The result obtained was noted down. The Clotting time was assessed using Wrights capillary tube method. The values obtained were noted down and compared. Statistical analysis was done and all values were expressed as Mean SD. p value <0.05 was considered significant.

### Statistical Analysis-

All the data was expressed as Mean SD. The data was collected and analysed using SPSS software. The comparison of the values was done using unpaired t test, and p value less than 0.05 was considered statistically significant.

| Parameter | Males<br>(Mean±SD) | Females<br>(Mean±SD) | p value |
|-----------|--------------------|----------------------|---------|
| BT        | 127.69±51.02       | 133.28±44.30         | 0.024   |
| CT        | 212.18±60.41       | 257.16±61.00         | <0.001  |

## RESULTS

The total sample size of the study was Sixty, out of which thirty were males and thirty were females. The data was expressed as Mean SD. the mean value of the bleeding time in males and females was found to be 127.69±51.02 and 133.28±44.30, this difference was found to be statistically significant as p value(0.024). The mean value of the Clotting time in males and females was found to be 212.18±60.41 and 257.16±61.00 and this difference was found to be statistically significant as p value was less than 0.001. The mean BT and CT was significantly greater in females as compared to males.

## DISCUSSION

Haemostasis or stoppage of bleeding consists of two steps, initially there is formation of a temporary haemostatic plug, after which there is formation of a definitive clot or permanent haemostatic plug. The first step reflects to platelet function and can be assessed by the estimation of bleeding time, and the second step i.e formation of a definitive plug can be assessed by the clotting time. Any deficiency of the clotting factors can lead to prolongation of the clotting time. In this study the BT and CT in males and females were assessed and compared. It was found that there is a significant difference in the bleeding time and clotting time among males and females. Females showed a higher bleeding time and clotting time and this difference was statistically significant. A study conducted by Reeta *et al.*<sup>8</sup> which studied the gender differences of the BT and CT in 154 students out of which 59 were females and 95 males showed BT and CT were higher in females as compared to males as found in this study. Another study conducted by Roy *et al.*<sup>9</sup>, in which the BT and CT was compared in males and females found similar results as found in this study. Another study conducted by Manjeet *et al.*<sup>10</sup> showed that the BT and CT was higher in females compared to males, but this difference was found to be not statistically significant. Another study by Meena and Sunil<sup>11</sup> revealed similar results, where BT and CT was higher in females as compared to the males. Whereas some studies have shown no variation of BT and CT among males and females<sup>12,13</sup>. Hormonal differences in males and females may be the reason for the increased BT and CT in females. The higher levels of estrogen and low plasma fibrinogen levels could be the reason for this.<sup>14</sup> Estrogen causes vasodilatation and prolongs the bleeding time.<sup>15</sup> The above explained reasons need to be further studied and the exact mechanisms which cause this variation in the BT and CT have to be studied. Thus the study concludes that there is significant difference in BT and CT in males and females, the mechanisms of which need to be studied.

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