# Physiological variations in Clotting time among 2<sup>nd</sup> year BDS students

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### Abstract

AIM:-To find the physiological variations in clotting time among 2nd year BDS students.

**OBJECTIVE**:-To examine the physical, personal and diurnal variations in clotting time.

**BACKGROUND:-** Clotting (also known as coagulation) is the process by which blood changes from a liquid to a gel, forming a clot. The normal clotting time is found to vary depending on the method used .The methods used to determine clotting time are capillary tube method and Lee-White method. The most commonly followed method is the capillary tube method. The normal clotting time is 2-8 minutes by capillary tube method.

**REASON:-**To evaluate the physiological variations in clotting time. This study concentrates on the physical factors that result in varied clotting time.

#### Introduction

Clotting time (CT) is the time interval from the onset of bleeding to formation of first fibrin thread (1). Clotting of blood involves activation, adhesion, and aggregation of platelets along with deposition and maturation of fibrin. Clotting time is performed during platelet disorders and a variety of treatment in hospitals. It was reported that platelet count were shown to decrease progressively by age, with the consequence of thrombocytopenia occurring more frequent in adults (2). Fibrinogen levels increases with age which shortens the clotting time, making elderly people more prone to thromboembolism (3).

Von Willibrand Factor (VWF) is a large glycoprotein produced by endothelial cells and megakaryocyte. Its major function is haemostasis (4).VWF plays an important role in formation of temporary haemostatic plug and it's conversion into definite clot by activation of clotting mechanism. Deficiency of VWF leads to haemostatic disorders, while elevated levels are a risk factor for thrombosis (5). According to Mourant et al and Qureshi et al, there is a clear association between ABO blood group status and Von Willibrand Factor (4). Clotting time and bleeding time is prolonged in females due to the presence of estrogen, which decrease the level of fibrinogen in the plasma and increase the clotting time (6).

## **Materials and Methods**

The study was carried out in the department of General Pathology, Saveetha Dental College, Chennai. A total of 100 students of  $2^{nd}$  year BDS students consisting of 72 females and 28 males between the age group of 18-21 years were selected. Clotting time was determined by Wright's Capillary tube method. The finger to be pricked was cleaned with spirit. A deep prick was made with a clean lancet and the first drop of blood was wiped. The finger was then squeezed to attain a large drop of blood to fill the capillary tube. The time duration to fill the tube was noted as the filling time. The capillary tube was held in a horizontal position for a minute. The tube was broken into smaller pieces after every 30s until the fibrin thread was seen. The duration till the fibrin thread was formed was noted. The purpose and procedure of the study was explained to each student. The normal clotting time by Capillary tube method is 5 - 10 minutes.

Statistical Analysis

# **CLOTTING TIME WITH GENDER**

GENDER	<5 mins	> 5 mins
MALE	21.67%	37.50%
FEMALE	78.33%	62.50%
TOTAL	100	100



Chi-square value for clotting time and gender

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	70.858ª	41	.003
Likelihood Ratio	84.470	41	.000
Linear-by-Linear Association	6.481	1	.011
N of Valid Cases	100		

a. 80 cells (95.2%) have expected count less than 5. The minimum expected count is .28.



Chi-square value for clotting time and diet

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	52.422ª	41	.109
Likelihood Ratio	47.622	41	.221
Linear-by-Linear Association	5.544	1	.019
N of Valid Cases	100		
a. 80 cells (95.2%) have expected count less than 5. The minimum			



**CLOTTING TIME WITH BLOOD GROUP** 

expected count is .15.

Chi-square value for clotting time and blood group

0

А

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	358.166 a	369	.647
Likelihood Ratio	193.227	369	1.000

В

AB

Linear-by-Linear Association	4.346	1	.037
N of Valid Cases	100		
a. 419 cells (99.8%) have expected count less than 5. The minimum expected count is .01.			

## Result

The available data of 100 students was analyzed. The age group was homogenous (18-21years) as all of them belonged to second year of BDS Curriculum. Out of the 100 students, 72 were females and 28 were males.

According to the role of gender, clotting time was prolonged in males. The average clotting time for males was 6.6 minutes and for females was 4.21 minutes. Statistically, there is significant difference between clotting time and gender (P<0.01) (males-6.6 minutes; females-4.21 minutes). Considering diet, 15 students were vegetarians and 85 were non-vegetarians. It was found that there is no statistical significance difference between clotting time of vegetarians and non-vegetarians (p>0.01). Our results stated that O group was predominant, followed by groups B, A and AB. The clotting time was prolonged in blood group B, followed by blood group O, A and AB, but there was no statistical significance seen (p>0.01).

## Discussion

A study done by Seal US et al, 1976, stated that clotting time was prolonged in females. clotting time is prolonged in females due presence of estrogen which decreases the plasma fibrinogen levels (6). Contrary to that study, in our study, we found that clotting time was prolonged in males (6.6 minutes). In this study, the distribution of blood groups showed predominance of blood group O followed by B, A and AB. Jenkin's PO et al stated that vWF is 25% more among non O blood groups, suggesting that the clotting time will be prolonged among the O groups (7). As per the study done by Mahapatra et al, clotting time was *prolonged* in B blood group (8) According to many studied, the prevalence of blood group in Asia is O>B>A>AB (2). Considering diet, the clotting time was prolonged among non vegetarians, though no significance was observed statistically.

Abnormal variations in clotting time may be due to deficient or abnormal clotting factors. The common disorders include Hemophilia A and B, Von Williebrand disease, Liver disease.

## Conclusion

In this study, the clotting time was found to be prolonged in males compared to females. Blood group O was the most common blood group among the students and AB was the least common blood group. Clotting time was prolonged in blood group B followed by O, A and AB. Gender wise clotting time was prolonged among males and among diet clotting time was prolonged among non-vegetarians which were both statistically insignificant. The insignificance can be due to the small sample size and possible errors. Further research with a larger sample size is recommended.

# **References**:

1. Kumar SS, VK JM, George J, Mukkadan JK. Bleeding time and clotting time in healthy male and female students of Karukutty Village, Kerala. JH Prospect. 12(1); 2013:7-9.

2. Skoda RC. Thrombocytosis Hematology. Am Soc HematolEduc Program. 2009:159–67.

3. Aizhong Fu, Srekumaran Nair. Age effect on fibrinogen and albumin synthesis in humans. AJP Endo. 275(6); 1998.

4. Dr.Sasekala.M, Dr.P.Saikumar.Relationship Between Bleeding Time And Clotting Time Among Gender Difference And Varying Blood Groups In UG Medical Students. IOSR-JDMS. 10(6); 2013:40-43.

5. Kaur M, Sing A, Bassi R, Kaur D. Blood group distribution and its relationship with bleeding time and clotting time. National Journal of Physiology and Pharmacology. 5 (3); 2015.

6. Seal US, Doe RP, Byar DP, Corle D.K. Response of plasma fibrinogen and plasminogen to hormone treatment and the relation of pretreatment values to mortality in patients with prostatic cancer. Cancer. 38(3); 1976: 1108-17

7. Jenkins PV, O'Donnell JS. ABO blood group determines plasma von Willebrand factor levels: a biologic function after all? Transfusion. 46 (10); 2006:1836-1844.

8. Mahapratra B, Mishra N. Comparison of bleeding time and clotting time in different blood groups. American Journal of infectious diseases. (2); 2005: 113-115.