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Physiological Variations in Bleeding Time Among 2nd Year BDS Students

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Abstract
Aim:- *To find the physiological variations in bleeding time among 2nd year BDS students.*
Objective:- *To examine the physical,personal and diurnal variations in bleeding time.*
Background:- *Bleeding time is a medical test to assess the platelets function and the body's ability to form a clot.The normal bleeding time is found to be 3-10mins depending on the method used.There are different methods to determine bleeding time like Ivy method,Duke's method,Mielke method,Simplate method.Duke's method is the most common method used in practice.*
Reason:- *To evaluate the physiological variations in bleeding time.This study concentrates on the physiological factors that result in varied bleeding time.*

I. Introduction

Bleeding time (BT) can be defined as 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. [1]. Bleeding time is the time interval between the skin puncture and spontaneous unassisted stoppage of bleeding[2].Bleeding time ordinarily lasts for 3 to 4 minutes.Bleeding time are performed during blood transfusion, diagnosis of platelet disorders and variety of forms of treatment in hospital[1]. Bleeding time (BT) test is used for assessment of platelet in human body. The most important advantage of BT test is it's ability to evaluate normal body haemostasis and the role of vessels in this process [4]. Human platelets are small discord-shaped cells with dimensions of about 2.4 by 0.5 micrometers and mean volume of 7-11 femto litre.Platelets dysfunction or decreased platelets count will increase the risk of bleeding[4]. The ABO blood group system influences the bleeding time. Blood group plays a vital role in transfusion medicine. It is determined genetically. ABO blood grouping is based on antigenic property of red blood cells. Type A individuals have the antigen A, type B have antigen B and type AB have both. Type O had neither of these antigens these A and B antigens are complex polysaccharides present on the surface of red blood cells that affect in their terminal sugar[2]. Recent research data show that ABO blood group are associated with various diseases such as duodenal ulcer,gastric cancer, diabetes mellitus , urinary tract infection and venous thrombosis[2].Von Willibrand Factor (VWF) is a large glycoprotein produced by endothelial cells and megakaryocyte. It's major functions is haemostasis[3].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[2]. According to Mourant et al and Qureshi et al, there is a clear association between ABO blood group status and Von Willibrand Factor[3]. As per the study conducted by hill et al, group O individuals had lowest plasma VWF levels and non O group (A,B and AB) had elevated levels of plasma VWF. They state that there is increased thrombotic risk among the non O group individuals [2]. This refers to increased BT and CT among O group compared to the non O group individuals at the same time Daniel M et al in his study, could not find any association between ABO group and Von Willibrand Factor[3]. Researches have shown that epistaxis is more often encountered in patients having blood group O probably due to lower expression of VWF and elevated levels a risk Factor for thrombosis. This, earlier studies found prolonged bleeding and clotting time in individual with O blood group[2]. Bleeding time is prolonged in thrombocytopenia, disseminated intravascular coagulation (DIC), Bernard-soulier disease[1].

II. Materials And Methods

The study was carried out in the department of General Pathology , Saveetha Dental College, Chennai. A total of 100 2nd year BDS students consisting of 72 females and 28 males under the age group of 18-21yrs were selected. Bleeding time was estimated by Duke method. A deep skin puncture was made and the length of time required for bleeding to stop was recorded by blotting the the drop of blood from the incision every 15s using blotting paper. Bleeding time was estimated by multiplying the number of drops on the paper and 15s. The purpose and procedure of the study were explained to each student. The normal bleeding time by Duke's method is 2-5mins.

III. Statistical Analysis

One-way analysis of variance(ANOVA) test was applied to examine the association between blood groups and BT. T-test was applied to find out the relation between gender and BT and also diet and BT.

Oneway

Descriptives

Bleeding time

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
A+ve	14	2.4468	.95253	.25458	1.8968	2.9968	1.00	4.28
A-ve	4	2.1525	.70405	.35203	1.0322	3.2728	1.30	3.00
B+ve	17	2.9529	1.37637	.33382	2.2453	3.6606	.45	5.00
B-ve	12	2.4592	.85992	.24824	1.9128	3.0055	1.00	4.07
AB+ve	8	2.9975	1.16386	.41149	2.0245	3.9705	1.30	4.36
AB-ve	2	3.5600	.70711	.50000	-2.7931	9.9131	3.06	4.06
O+ve	39	2.3985	.94917	.15199	2.0908	2.7061	1.00	5.00
O-ve	4	2.8625	.87690	.43845	1.4672	4.2578	2.20	4.05
Total	100	2.5867	1.03809	.10381	2.3807	2.7926	.45	5.00

ANOVA

Bleeding time

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.434	7	1.205	1.128	.352
Within Groups	98.250	92	1.068		
Total	106.685	99			

T-Test

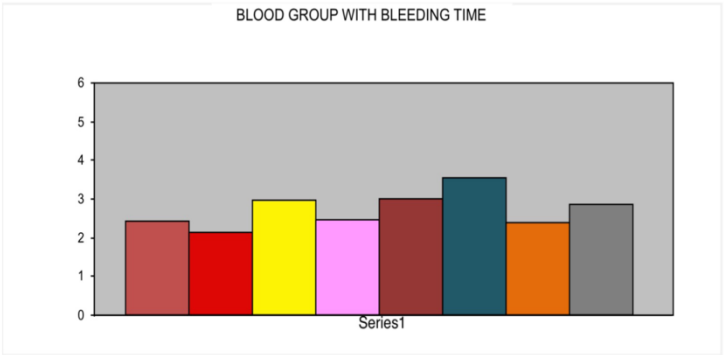
Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Bleeding time	Male	28	3.0816	1.11801	.21128
	Female	72	2.3942	.94503	.11137

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Bleeding time	Equal variances assumed	2.633	.108	3.100	98	.003	.68744	.22176	.24737	1.12751
	Equal variances not assumed			2.878	42.832	.006	.68744	.23884	.20572	1.16916

		A+ve	2.44		0.95
		A-ve	2.15		0.7
		B+ve	2.95		1.37
		B-ve	2.45		0.85
		AB+ve	2.99		1.16
		AB-ve	3.56		0.7
		O+ve	2.39		0.94
		O-ve	2.86		0.87



T-Test

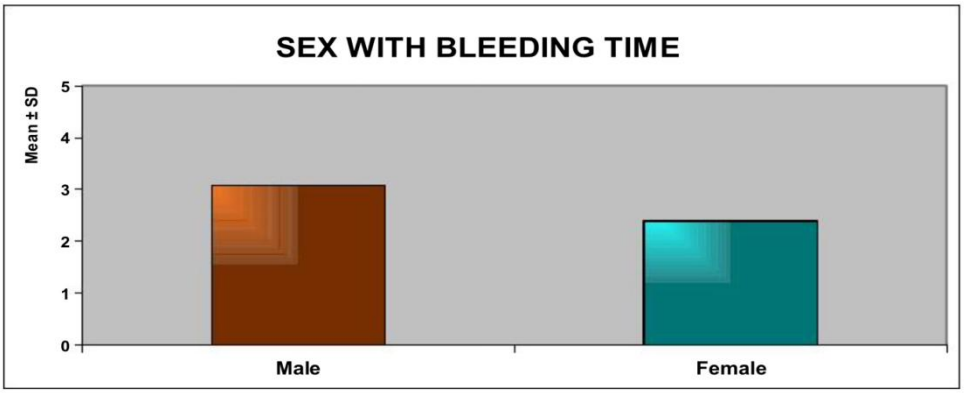
Group Statistics

	Diet	N	Mean	Std. Deviation	Std. Error Mean
Bleeding time	Veg	15	2.8753	.97058	.25060
	Non Veg	85	2.5357	1.04668	.11353

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Bleeding time	Equal variances assumed	.626	.431	1.170	98	.245	.33963	.29018	-.23623	.91548
	Equal variances not assumed			1.234	20.194	.231	.33963	.27512	-.23391	.91316

Male	3.08	1.11
Female	2.39	0.94



IV. Results

The available data of 100 students was analyzed. The age group was homogeneous (18-21yrs) as all of them belonged to second year of BDS Curriculum. Of 100 students 72 were females and 28 were males.

Our results stated that blood group O was more predominant, followed by groups B,A and AB. It was found that the bleeding time was prolonged in blood groups AB followed by blood groups B, O,A. One-way

Veg	2.87	0.97
Non Veg	2.53	1.04

Anova tests performed on the data did not show statistically significant difference between the BT of ABO groups(p=0.352). While considering the role of sex, BT was more prolonged in males than females as shown by the T-test analysis.

Considering the diet, 15 students were vegetarians and 85 students were non-vegetarians. It was found that the BT was slightly high in vegetarians than non-vegetarians but there is no significant difference between the BT of vegetarians and non vegetarians which was concluded by the T-test analysis.

V. Discussion

In this study conducted on 100 students, the distribution of blood Groups showed predominance of blood group O followed by blood group B,A and AB. Asiatic trend of prevalence of blood groups O>B>A>AB has been reported by many research studies [2]. Contrary to the other studies it was found that BT was more prolonged in AB blood groupwhich is a non-O group followed by blood groups B,O,A. But there was no significant difference between the blood groups and BT(p=.352).

Regarding gender wise distribution of BT it was observed that there was higher BT in males compared to females but not statistically significant. This was in contrary to other studies conducted which showed higher BT in females than males.Higher BT in males can be due to testosterone which inhibits the platelet aggregation [1].Considering diet it was found that BT was prolonged in vegetarian than in non vegetarian diet which was not up to statistical significance level.

Abnormal variations in bleeding time may lead to bleeding disorders. Most commonly acquired bleeding disorders are disseminated intravascular coagulation,Intraoperative metabolic abnormalities, Liver disease, Vitamin K deficiency [5]. Some bleeding disorders are inherited which are haemophilias and von Willebrand disease [5].

VI. Conclusion

Blood group O was the most common blood group among the students and AB was least common blood group. BT was prolonged in blood group AB followed by B,O,A. Also there was no statistically significant relation between blood groups and BT. Gender wise BT was higher in males (with the mean value of 3.1) compared to females but the difference was statistically insignificant. Diet wise BT was prolonged in vegetarians(with the mean value of 2.8) than non- vegetarians but the difference was insignificant. The statistically insignificant values may be due to the small sample size and possible errors. Further research with a larger sample size is recommended.

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