



Research Article

Asian Journal of Medical and Pharmaceutical Sciences

www.pharmaresearchlibrary.com/ajmps

AJMPS, 2013; Vol.1(1): 1-4

To study the blood group distribution and its relationship with bleeding and clotting time in dental students

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Available Online: 19 December 2013

Abstract

Blood Group is Man's complete & unchangeable identity. Blood groups are genetically determined. Blood group, bleeding time & clotting time are clinically useful tests, extensively used during blood transfusion, Platelet disorders & variety of forms of treatment in hospitals. Present study was conducted to assess the blood group distribution & its relationship with bleeding & clotting time in dental students. The study was conducted on 359 B.D.S students; to find out % distribution of ABO blood groups. Blood Groups were determined by direct agglutination method using Monoclonal ERYSCREEN Tulip Diagnostics Ltd. (India) kit against human A & B antigens. Bleeding time was estimated by Duke Method and clotting time was estimated by capillary tube method. Blood group 'B' is the most common blood group in both genders among the Dental students & 'AB' is the least common blood group. Also there is no statistically significant correlation between blood groups, bleeding & clotting time. Bigger multicentric study is suggested to verify the above findings.

Keywords: Blood Group, ABO blood groups, Rhesus (Rh) blood group, Percentage (%), Bleeding time (BT), Clotting time (CT)

Introduction

The need for blood group distribution study is multipurpose, as besides their importance in evolution; their relation to disease & environment is being increasingly sought in modern medicine.⁽¹⁾ Blood group antigens are not only important in relation to blood transfusion & organ transplantation, but also it have been utilized in genetic research, anthropology & tracing ancestral relation of humans^(2,3,4). Blood transfusion is a major development in medicine as it is life saving measure in the management of varieties of medical & surgical conditions since the first human-to-human transfusion in 1918⁽⁵⁾. Blood group remains the most important system in blood transfusion practice. Almost 400 blood grouping antigens have been reported. The ABO & Rh blood group antigen are recognized as the major (clinically significant) blood group antigens. ABO blood group system was first discovered by Karl Landsteiner in 1900 at University of Vienna in the process of understanding why blood transfusion sometimes causes death & at other times save the patient. Thirty year later he belatedly received the Nobel Prize for this discovery^(6,7). The Rh blood group system was discovered by Landsteiner & winner. The study of blood grouping is very important as it plays an important role in genetics, blood transfusion and forensic pathology. It may have some association with disease like Duodenal Ulcer⁽⁸⁾, Diabetes Mellitus⁽⁹⁾ Urinary tract infection⁽¹⁰⁾, Rh incompatibility & ABO incompatibility of newborn. Also it was found that carcinoma of cervix had higher frequency in female with blood group A⁽¹¹⁾. A significant association was identified for cholera in which cholera patients were twice as likely to have blood group 'O' & one ninth as likely to have blood group AB as community controls⁽¹²⁾. Some interesting facts are also related to blood groups. An association has been found between distribution of finger print (dermatographic) pattern & blood groups. The correlation is more consistent for blood group 'A' with loops, while arches are more common in blood group 'AB'⁽¹³⁾.

Materials and Methods

A descriptive study was carried out on 359 healthy B.D.S. students in the Department of Physiology, Bharati

Vidyapeeth Deemed University Dental College and hospital, Sangli. All the students of 1st, 2nd, 3rd & final year were included in the study. Students were evaluated as per standard proforma, which included a questionnaire. Total 359 students were included, out of which 128 were males & 231 were females, to whom the experimental protocol was explained and written informed consent was obtained from them. All the students were Indian & they had come from different states of India. ABO blood group was determined during practical time in physiology laboratory by conventional spot tile method. Blood samples were collected by finger prick with sterile lancet after cleaning the puncture site with spirit. Each drop of blood was placed on a spot tile containing a blood typing anti sera. For the detection of blood group, Monoclonal ERYSCREEN TM-Tulip diagnostic Ltd. (India) anti sera kits were used. Agglutination of the blood drop with anti sera was then assessed by gross inspection and microscopy. Blood groups were determined on the basis of presence or absence of agglutination. Bleeding time was estimated by Duke Method and clotting time was estimated by capillary tube method⁽¹⁴⁾. All the students of dental sciences were included in the study & students with bleeding & clotting time disorders were excluded from the study to avoid bias.

Results and Discussion

The available data of 359 students were analyzed by using Excel 2003, statistical package for social sciences (SPSS). The Chi- square & ANOVA tests were applied to examine association between blood group & bleeding, clotting time. The distribution of ABO blood groups in Dental students are shown in Table No. I. Our results state that blood group 'B' is more predominant in both the genders among the Dental students. The % distribution of ABO Blood groups was in order of B (35.65%) > O (25.62%) > A (23.39%) > AB (15.32%). The distribution of clotting time & bleeding time according to sex & blood groups are shown in table No. II & III. Clotting time was prolonged < 6 Min among blood group B, followed by A, O, & AB as shown in table No-II. But there is no statistically significant association between blood group & clotting time ($p < 1.000$). Also as shown in table No.III bleeding time is prolonged > 4 Min in B blood group followed by A, AB & O. Here also there is no statistically significant correlation between blood group & bleeding time ($p < 0.909$). Also as shown in Table No. IV Distribution of bleeding & Clotting time according to blood group was not found to be statistically significant. While considering role of sex clotting is prolonged in female than male. But there is no statistically significant correlation found among male, female & blood groups ($p < 0.103$).

Discussion

In the present study blood group 'B' was predominant while 'AB' was the least common blood group. Findings of our study was coincides with findings of Ahmed Khurshid pasa et al. ⁽¹⁵⁾. & Abhisekh B; Myadevi S; et al ⁽¹⁶⁾. Results of Shaikh YA et al. showed that the predominance of blood group 'O' in contrast to our study. ⁽¹⁷⁾ Nwauche C.A. et al. Prevalence study from Nigerian population showed blood group O>A>B>AB which is contrast to our study except for the fact that AB is the least common blood group in both the studies ⁽¹⁸⁾. Yousaf et al. in his study from Bahawalpur showed that same distribution of blood groups that what we found. ⁽¹⁹⁾ In India same prevalence of ABO blood group was reported as in our study⁽²⁰⁾. Findings of our study was coincide with Fathelrahman H. et al. ⁽²⁾ showed that blood group 'B' was dominant in both the genders & 'AB' group was least common in both the gender. A study done by Mahapatra et al. found that CT was prolonged in blood group B compared to O blood group & BT was significantly higher in AB group. Also they stated that there was no gender wise significant difference in BT & CT⁽¹⁷⁾. But our study has contraindicated that findings, showing females have higher bleeding & clotting time as compare to males. This might be due to the presence of estrogens females which increase the CT & decrease level of fibrinogen of blood plasma. Also in our study there is no statistically significant correlation between blood groups, bleeding & clotting time. This difference in % distribution of blood group in various studies may be due to sampling error, genetic factors, natural selection which is affected by traditions and habits (exogamy, endogamy) ⁽²¹⁾ & also may be due to all the students were coming from different states of India.

Observation Tables

Table No.I - Distribution of ABO Blood group according to sex

BLOOD GROUP	MALE (128)	FEMALE (231)	TOTAL (359)	% Distribution
A	28	56	84	23.4
B	44	84	128	35.7
AB	14	41	55	15.3
O	42	50	92	25.6

Chi-square = 6.791 with 3 degrees of freedom; P = 0.103 Not significant association

Table No. II. Distribution of clotting time according to sex and blood group

BLOOD GROUP	MALE (128)		FEMALE (231)		Total (359)	
	CT < 6 Min	CT > 6 Min	CT < 6 Min	CT > 6 Min	CT < 6 Min	CT > 6 Min
A	28	0	53	3	81	3
B	42	2	83	1	125	3
AB	14	0	40	1	54	1
O	40	2	50	0	90	2
Total	124	4	226	5	350	9

Chi-square = 0.580 with 3 degrees of freedom; P = 1.000 Not significant

Table No. III. Distribution of bleeding time according to sex and blood group

BLOOD GROUP	MALE (128)		FEMALE (231)		Total (359)	
	BT < 4 Min	BT > 4 Min	BT < 4 Min	BT > 4 Min	BT < 4 Min	BT > 4 Min
A	26	2	54	2	80	4
B	41	3	80	4	121	7
AB	14	0	38	3	52	3
O	40	2	50	0	90	2
Total	121	7	222	9	343	16

Chi-square = 1.581 with 3 degrees of freedom; P = 0.909 Not significant

Table No. IV. Distribution of Clotting & Bleeding time according to blood group

Parameters	N	Mean \pm SD	F	Sig.	
C T	A	84	4.0321 \pm 1.04177	1.565	0.198 Not significant
	AB	55	4.0073 \pm 1.00524		
	B	128	4.0242 \pm 0.98030		
	O	92	3.7652 \pm 0.93367		
	Total	359	3.9571 \pm 0.98960		
B T	A	84	2.8625 \pm 0.85175	0.618	0.604 Not significant
	AB	55	3.0145 \pm 0.88011		
	B	128	2.8711 \pm 0.83188		
	O	92	2.8207 \pm 0.87260		
	Total	359	2.8781 \pm 0.85315		

Conclusion

Blood group 'B' is the most common blood group in both genders among the Dental students & 'AB' is the least common blood group. Clotting time is prolonged < 6 min among blood group B, followed by A, O, & AB. bleeding time is prolonged > 4 min in B blood group followed by A, AB & O. Also there is no statistically significant correlation between blood groups, bleeding & clotting time. Bigger multicentric study is suggested to verify the above findings. This data will helpful to prepare database for the blood bank of our institution, where the certain blood groups are needed more than other in emergency conditions.

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