

Blood groups distribution & its relationship with bleeding time and clotting time

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الخلاصة

أجريت هذه الدراسة على طلبة المرحلة الثانية للدراسات الأولية في كلية الطب في مختبر الفسلجة . أجريت الدراسة من الفترة من ايلول 2011 ولغاية كانون الاول 2013، اشتملت الدراسة على 265 طالب، منهم 169 انثى و 96 ذكر تتراوح اعمارهم بين 19-21 سنة . تم تحديد نوع فصيلة الدم لكل الطلبة ثم تحديد وقت التخثر ووقت النزف ، ولقد وجد ان فصيلة دم (ب) هي الفصيلة المتغلبة بين الطلبة ، وان وقت التخثر ووقت النزف يكونان اطول عند اصحاب فصيلة دم (و) مقارنة بالباقيين كما ان وقت التخثر ووقت النزف كان اطول عند الأناث مقارنة بالذكور .

Abstract

The study carried out on 265 of 2nd year MBchB healthy student in the department of physiology ,collage of medicine in Al-Qadisiya university The study achieved from September 2011 to December 2013, including 265 students ,out of which were 169 females & 96 males. With age range (19- 21 years). Determination of blood group was done for all students and then bleeding & clotting time was determined for each student, it was founded that blood group B was more predominant than other groups among the students, and the clotting & bleeding time was more prolonged in those with blood group O as compared with others , also the female was showing to have prolong clotting & bleeding time than male students.

Introduction

In 1900 ABO blood group system discovered by Landsteiner in the process of understanding why blood transfusion sometimes causes death & at other times save the patient , he demonstrated that depending on the agglutinogenes present on the RBCs human being are classified into 4 types or groups⁽¹⁾The Rh system was discovered by Landsteiner & winner⁽²⁾&is one of the most polymorphic of the human blood groups. According to the presence or absence of Rh antigens blood is classified into Rh positive or negative⁽³⁾.

The gene for ABO group is present on chromosome 9 while for Rh system it is on chromosome 1. ⁽³⁾The ABO system consists of complex carbohydrate molecules. The A and B Glycosyltransferase encoded by A and B alleles converts H antigen into A and B determinants. This transferase enzyme is

deficient in the group O individuals who continue to express H antigen⁽⁴⁾.

The study of blood grouping is very important as it plays an important role in genetics, blood transfusion and forensic pathology⁽³⁾, It may have some association with disease like Duodenal Ulcer, Diabetes Mellitus Urinary tract infection,&Rh incompatibility & ABO incompatibility of newborn^(4,5,6).Also it was found that carcinoma of cervix had higher frequency in female with blood group A ⁽⁷⁾.

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⁽⁸⁾.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' (9).

There is a clear association between ABO blood group status and Von Willibrandfactor (10,11). Von Willebrand factor is a large glycoprotein produced by endothelial cells and megakaryocyte. Its major function is Hemostasis. Deficiency of vWF leads to Hemorrhagic disorders,

while elevated levels are a risk factor for thrombosis (12, 13 14) Group O individuals had lowest plasmapvWF levels and non O groups (A,B and AB) had elevated levels of plasma vWF.& there is increased thrombotic risk among the non O group individuals.This refers to increased Bleeding time and Clotting time among O group compared to the non O group individuals(15) .

Aim of study

The objective of this study was to assess the relationship between Bleeding time and clotting time among various

Blood groups and also to identify any gender difference among the same.

Materials and Methods

The study carried out on 265 2nd year MBchBhealthy student in the department of physiology ,collage of medicine in al-Qadisiya university The study achieved from September 2011 to December 2013, including 265 students ,out of which were 169 females & 96 males , with age range 19- 21 years .The exclusion criteria for selection of the students were any history of bleeding

disorders and history of drug intake (NSAIDS).

Determination of blood group was done for all students by mixing the sample of blood with antisera A and B and looking for clumping of RBCs under the microscope , the bleeding time was estimated by Duke method and clotting time was estimated by capillary tube method (1) for each students.

Results

The data of 265 students were collected and analyzed statistically by using (chi square & SPSS). The study group's age was homogenous (19-21 years) as everyone belonged to 2nd year

MBchB. Out of 265 students there were 169 females and 96 males.

The distribution of ABO blood groups among the students shown in (table1).

Table (1) : Distribution of Blood group according to sex

Blood group	Male (96)	Female (169)	Total 265)	% distribution
O	28	48	76	28.68
A	19	42	61	23.018
B	41	58	99	37.36
AB	8	21	29	10.943

$$X^2 = 2.784, \quad 3 \text{ degrees of freedom} \quad P = 0.426$$

No significant association

Table (2):Distribution of clotting time according to blood group .

BLOOD GROUP	CT < 6 Min (%)	CT > 6 Min(%)	Total
O	57(75)	19 (25)	76
A	56(91.8)	5(8.196)	61
B	93(93.9)	6(6.06)	99
AB	28(96.5)	1(3.44)	29
Total	243(91.698)	22(8.3018)	265

$$X^2 = 18.699 \quad \text{with } 3 \text{ degrees of freedom} \quad P < 0.001, \quad \text{sigmnificant}$$

Table (3) : Distribution of bleeding time on various blood groups.

BLOOD GROUP	BT < 4 Min (%)	BT > 4 Min(%)	Total
O	59(77.6)	17(22.4)	76
A	54(88.5)	7(11.5)	61
B	89(89.9)	10(10.1)	99
AB	26(89.6)	3(10.34)	29
Total	228(91.698)	37(8.3018)	265

$X^2 = 12.57$ 3 degrees of freedom ,P value 0.0057 ,significant

Table – 4: Gender wise distribution of Clotting time.

gender	< 6 mins (%)	> 6 mins (%)	Total
Male	91(94.7)	5(5.2)	96
Female	152(89.9)	17(10.0)	169

P value =0.2828 , not significant (alpha<0.05)

Table (5):. Gender wise distribution of Bleeding time.

Gender	< 4 mins (%)	> 4 mins (%)	Total
Male	85(88.5)	11(11.4)	96
Female	143(84.6)	26(15.38)	169

P value =0.5289 (alpha<0.05) Not significant

Discussion

The present study shows that blood group B is more predominant in both gender among the students as shown in(table (1))in the order of B(37.36%) , O (28.68%), A (23.02%)and AB (10.94%), this results are coincides with findings of Morant AE⁽¹⁰⁾ , Ahmed Khurshid et al⁽¹⁶⁾ Abhisekh et al⁽¹⁷⁾ , &Smita , et al⁽²⁾ , while B. Mahapatra , N. Mishraalso⁽¹⁸⁾ . Sasekala M.I , P. Saikumar⁽¹⁹⁾ , and Shaikh YA et al⁽²⁰⁾ found that blood group O is more predominant , it has been observed that in different region of the world there is specific ABO distribution which varies in different geographical & ethnic , and socioeconomic groups⁽²¹⁾ .

The present study shows that clotting time & bleeding time is prolonged in blood group O which statistically significant ((Table 2&3)) , this result is agreed by Massimo Franchini et al⁽²²⁾ who pointed that when compared to the type O group, the non O group individuals can have an increased risk of thrombosis due to the higher levels of vWF.He also states that, the ABO group can affect the vWF catabolism, meaning that the plasma vWF levels may depend

upon blood group of the individual⁽²²⁾ . This concept was accepted by other studies done by Jenkin's P.O et al⁽²³⁾ , who stated that vWF is 25% more in non O group individuals compared to group O individuals. This means that the clotting time and the bleeding time will be elevated among the O group individuals compared to the other groups.

Smita V et al⁽²⁾ found that clotting time & bleeding time prolonged in those with blood group B . regarding Mahapatra et al⁽¹⁸⁾ ,Sasekala M I, P.Saikumar⁽¹⁹⁾ they pointed that clotting time is significantly prolonged among blood group B individuals, but bleeding time prolonged in people with AB blood group compared with other groups this differences in %distribution of blood group in various studies may be due to sampling error , genetic factors, natural selection which is affected by traditions & habits⁽²⁴⁾ .

In the present study (10%) of female had clotting time > 6min compared with(5.2%) in male as shown in tabe(4) , also(15.38%) of female had bleeding time > 4 min compared with (11.4%) of male ;table (5) , which is statiatiacally not significant this result is agreed by Smita

et al⁽²⁾, Sasekala M I, Saikumar⁽¹⁹⁾ Roy B et al⁽³⁾, this can be due to the presence of estrogens which decrease the level of fibrinogen in the plasma & increase the clotting time⁽²⁵⁾.

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