

Difference between Blood Group among Male and Female First Year Undergraduate Medical Students

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ABSTRACT

Global Society of Blood Transfusion has currently identified 33 blood institution systems. Other than ABO and Rhesus machine, many other kinds of antigens have been noticed at the pink cellular membranes. Blood grouping and move-matching is one of the few important exams that the anaesthesiologist orders in the course of perioperative period. Therefore, a right understanding of the blood group system, their medical importance, typing and pass-matching assessments, and cutting-edge attitude are of paramount significance to save you transfusion-associated complications. Despite the fact that, the know-how on blood group device is vital to approach blood institution-connected diseases which might be nevertheless on the stage of studies? This review addresses some of these components of the blood businesses device.

The less strong categories of blood types A and B, that can be further seen as subordinate groups such as ABO, are seen as coordinated institutions, that react in a very vulnerable or negative manner with other types such as anti-A or Anti - B antisera. Moreover, these transfusion facilities are often hindered by the presence of these subordinate categories that eventually result in an ABO inconsistency. However, if opposite pairing of these types is not complete, these inconsistencies in the ABO subcategory can be disregarded.

This examine changed into deliberate to evaluate the possibility of various subordinate groups that can be seen as an ABO inconsistency among the population of India, and provide a perception to transfusion offerings for identity of subordinate categories in a serological manner.

An analysis in a sectional manner turned into carried out at a superior healthcare founded on totally blood bank on the various donors of blood and sufferers from January 2017 to July 2018. The samples that were suspected in type II and sort IV(with Anti-A1) among the ABO distinct category, were then all subjected to checking through a strong algorithmic method in order to assess the inconsistency and then narrow it to the most likely subordinate category.

INTRODUCTION

The molecules of carbohydrates on the extra cellular body of the red blood cells are complex. The cessing of bleeding from the injured blood vessels is called homeostasis [1]. The main objective is to assess the scattering of groups of blood, in the male and female and to keep a check on the bleeding and time of clotting. A modern study revealed that O blood group is highly found to be more probable in both males and females. In males, it is 25% and in females, it is 14.5%. In O and AB blood groups in females, clotting time is found to be more, whereas bleeding time is different in both the sexes. In a research carried out all over the world, it was found out that Caucasian patients with blood group O are about 50.4% in comparison with 45.10% of the control group O blood group [2]. The population that have an O blood group are more vulnerable to gastrointestinal

infections. It has been understood that a higher concentration of Von willie brand factor is observed in both the population who have O blood group and other blood groups such as, non O blood group people, while other blood groups such as A, B, as well as AB blood group individuals are more prone to thrombotic diseases that are inclined towards arterial and venous issues [3].

1. In a four year study period of cohort of 28129 subjects in an opd of an institution blood were collected from the donors. It was found out that out of 28129 subjects 20897 were female and 7231 were males. Interestingly, it was found that the commonality between male gender and blood group A was as high as 43.40% in males and 40.50% in females [4].
2. In blood group B, 10.70% were males and 13.48% were females.

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3. There were no difference as such detected for groups O and AB.
4. However, the group a commonality seemed to gradually increase with age, in the case of females [5].
5. Unlike the other groups, groups AB and B were seen to undergo a gradual dip through the ages.
6. However, Group B in the male group was observed to change highly with age.
7. Moreover, only 7 in 10 with age greater than 99 years had blood groups O.
8. It was noted that with age, the number of individuals related to group A increased with age, while it underwent a decrease with groups AB and B, thus highlighting a weak association with the various categories of blood groups.
9. Ultimately, Group AB has a negative correlation with age and group A blood increase with age but this was significantly only in females [6-7].

The interval from the moment of rupture of the finger in order to ooze the blood, till the time the fibrin thread is formed, is known in stand as the clotting time.

METHOD

1. Noting the time, a bold prick has to be made in the finger. The finger should not be squeezed for the blood at any cost.
2. The next step is to use a strip of filter paper in order to obtain the patch of blood, after 30 seconds, and then count the total number of blood patches.
3. Once again, attention has to be made to count the time once the blood stops oozing, after the blood stops oozing from the cut. However, it can also be observed that the size of the blood patches gradually becomes smaller, until the blood stops from the rupture.
4. The standard bleeding time should be about 3 minutes at an average, with a standard range of about 2 to 5 minutes.
5. The two standard techniques of coagulation time that can be referred to are Wright method and capillary glass tube method
6. By holding the capillary tube in a horizontal position, the clotting of the second drop of blood can be achieved, and this capillary action will assist in filling the tube with blood
7. Allow a minute to pass before attempting to break a piece of the tube after every 15 seconds, that will allow the coagulation to occur. Once the coagulation has taken place, a fine fibrin thread will be visible that will connect the broken ends of the tube. The time should be noted at this point.
8. The coagulation time can be revealed at this stage with the help of calculating the time interval between pricking the finger and the appearance of the fibrin thread.
9. The standard coagulation timerests at anaverage of about 4 minutes, with a range of at least 3 to 8 minutes [8].

Dukes method

This technique is a flexible as well as simple method that is used by many around the world. Once the timer is finally placed at

zero, the finger is then wiped with the help of a spirit, while a deep cut or a rupture is made on the finger to facilitate the emission of the blood without even squeezing the finger. As soon as the timer begins, the time is then calculated as zero time. After about a time span of 30 seconds, the blood is then dried on a filter paper, which is clean. The method is continuously practised after every 30 seconds, until the blood is dry and stops to flow, and no spot of blood surfaces on the filter paper. In this manner, each spot of blood stands representative of every 30 second of blood flow. The next step includes counting the total number of the spots of blood, which is then multiplied by $\frac{1}{2}$, in order to achieve the bleeding time in minutes. Usually, the bleeding time lies between the range of about 2 to 6 minutes on average [9].

Capillary glass tube method

One of the most widely acclaimed, easy, as well as an effective procedure is the capillary glass tube method. In order to begin with the method, the spirit is used to clean the finger which is then kept to dry. The next step involves making a deep cut that allows the free flow of blood. This process also reveals zero time which is the actual time of the rupture of the finger. Once the blood is collected in the lancet, the capillary tube is then thrust into the capillary tube that is capable of holding drops, in such a way that the other end of the tube is placed at a comparatively lower level that ensures the free flow of blood into the tube. Moreover, the body temperature of the tube is maintained by holding it between the palm of the hand, and at the end of about a minute, a centimetre of the tube is broken from one end to ascertain if a fibrin strand is visible and joining the two ends of the tube. The presence of one such thread of at least 5mm will then ensure that the blood has clotted, and thus, the clotting time is revealed which is the sum of the time taken from the zero time, until the appearance of the fibrin thread. This process usually starts at about 3 minutes till about 8 minutes. However, in case of a lack of fibrin thread, this method should be repeated every 30 seconds until a thread finally appears [9].

Blood grouping

The amount of blood in an individual usually depends on their body size. Furthermore, that individual's blood composition will vary from other individual's blood composition, in short, every single individual has a different blood composition. This kind of difference in blood composition makes an individual's blood type.

A subject's type of blood will be dependent on the kind of genes they has been provided to them from their parents through inheritance.

ABO system is a widely used system so far for grouping people's blood group among all the methods. In ABO blood grouping system, the system is categorised into four major blood groups mainly A,B,AB and O. More to add, there are eight more blood types but we will limit our discussion to the four major groups.

In India, every 2 seconds someone is in dire need of a blood transfusion. In a day, more than 38,000 blood donations are needed per day and people are advised to donate blood regularly. When an individual needs a transfusion, he must be supplied with the right type of blood group. Failure of giving a wrong blood group type in a blood transfusion may result in complications [10].

Blood composition

Blood is mainly constituted of:

1. RBCs as in Red Blood Cells generally used to supply oxygen [11]
2. WBCs as in White Blood Cells, which is marked to control the immune system.
3. The plasma, which can be barely yellow to dark yellow sometimes brown, orange or green tinge also. It mainly, contains proteins as well as salts.
4. Lastly, the platelets, that mainly helps in blood clotting.

On the whole, the blood group depends on what kind of antigen is lying on the exterior body of RBCs.

Antigens are basically molecules. These molecules can either be a protein or a sugar. Their type as well as their features can vary from one person to the other the main reason behind these is the small genetic differences which prevails among human beings.

The various types of Blood along with ABO

The ABO system of blood grouping categorizes the different blood groups by the type of antigen that is found on the exterior body of RBCs in a human body [12].

There are mainly four types of blood groups:

- a) **Group A:** The body of this type of red blood cells contain antigen A on their surface and the plasma comprises of anti B- antibody. Antibody anti -B has the potential to attack those blood cells that include the antigen B.
- b) **Group B:** The outside of this type of blood cells contain antigen B on their surface and the plasma comprises anti A- antibody. Antibody anti-A has the potential to attack those blood cells which contain antigen A.
- c) **Group AB-** The exterior of this type of blood cells include both of the antigens A and B and the blood plasma is deficit of both the antibodies anti-A and anti-B. This type of blood among people can accept blood from any blood type of the blood grouping system and so they are called universal recipients.
- d) **Group O-** The surface of this type of blood cells is deficit of both the antigens A and B but the plasma has both the antibodies that is anti-A and anti-B. As there are no antigens present in this type of blood group, people having this kind of blood groups can participate in donating their blood to any category of blood group, and are thus known as universal donors.

Rhesus factor

A few of the red blood cells also have a different set of antigens called Rh factor also can be called Rh⁺ antigen along with the above mentioned antigens [13].

If an individual is Rh⁺ it indicates that they have Rh antigens and if they are Rh⁻ it signifies that they don't have Rh antigens.

BLOOD TYPE IN PREGNANCY

If a case arises where the two parents do not have the same categories of blood, the mother might not possess the same type of blood as the child or the Rh factor.

A high risk during pregnancy might arise if the mother has a different category of Rh factor than the child, such as Rh⁻ negative blood, while the baby is Rh⁺.

During the birth of the first child who is Rh⁺ while the mother is Rh⁻ a tiny number of foetal cells might exceed the placenta in order to penetrate the mother's blood. At that time anti-RhD antibody might be produces in the plasma of the mother, this process is known as sensitization.

A problem might arise at that time if by any chance this antibody will detect a "FOREIGN" antigen in the foetal cells. Those antibodies will then attack those foreign antigens as a defense mechanism [14].

Cases might arise, where there might be possibility of severe jaundice or a brain damage. At that time the mother should be injected anti-D immunoglobulin at 28 weeks and 34 weeks of the first pregnancy as a way of preventing such issues as stated by the World Health Organisation (WHO).

The hypothesis was generated that pre-menopausal women are not likely to suffer from any type of cardiovascular diseases as much as men in any category of age. This is because of systematic physiological bleeding that leads to rheological characteristics of blood among pre-menopausal women to be higher than that of men. It can be estimated that this distinction in the hem rheological characteristics is because of the less assemblage of red blood cells, along with a higher concentration of scarce populace of comparatively older red blood cells in the female blood. Upon studying the mechanical features of blood obtained from 47 pre-menopausal women as well as 50 age-matched men, it was observed that in comparison to the female blood, the male blood was more viscous, had a higher RBC aggregation as well as less RBC deformability. Furthermore, the Oxygen Delivery Index which is a ratio of haematocrit to viscosity of blood was also drastically less in the male blood as compared to the male counterparts [14-18].

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