

Study of Role of the Whole Blood Transfusion in Resuscitation of Severe Haemorrhage Cases in Tertiary Care Hospital of North India

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ABSTRACT

Background: Whole blood is rarely used nowadays, but in few hospitals where the blood component not available, the whole blood can be used in resuscitation of severe hemorrhage cases.

Material and Methods: This is prospective study done in the blood bank of A.S.M. college Firozabad, over 6 months, where total unit of whole blood was 850, where voluntary blood donors units are 588, replacement units are 256 and 6 units are discarded and there is no professional blood donor. Results : Departments where the whole blood unit used in resuscitation from the severe hemorrhage causes are, gynae & obstetric department issued 386 unit whole blood, pediatric department 150, surgery 215, medicine 77, trauma 10, few others departments (ophthalmology, laryngology, and orthopedic department) where two unit of the whole blood used by each department during the study periods.

Conclusion: Whole Blood still can play role in saving the life from severe hemorrhage causes, if component therapy not available, but make sure that careful group matching, compatibility matching, and TTI testing to decrease the risk of transfusion reaction and increase the survival rate.

Key Words: Whole Blood, Hemorrhage, Resuscitation, Component.

INTRODUCTION

Blood in blood transfusion used as a drug and whole blood is rarely used nowadays; it is replaced by component therapy.

[1] Uses of whole blood has been replaced by their blood component, but few cases where there is the role of whole blood, such as in developed countries, whole blood use in autologous donations for elective surgery, [2] as well as few cases where whole blood can be used life-saving therapeutic benefits in a few patients, for example in large volume hemorrhage caused either by major trauma or by post-partum hemorrhage. Whole blood can also use in the rapid correction of anemia, acidosis as well as in hypothermia. [3]

Whole blood contains Red Blood Cells (RBCs), Platelets as well as plasma derivative which are used to perform their respective functions such as hemoglobin of RBCs used for oxygen transport. Platelet and plasma containing coagulation factors which are used to maintain hemostasis. Beside this, the plasma of whole blood can be used for the formation of albumin, immunoglobulin, few coagulation factors, by plasma fractionation, which can be further used as life-saving therapy.

The life span of the whole blood is 35-45 days, depending on the anticoagulant used in blood bags such as 35 days in Citrate, Phosphate, Dextrose Adenine (CPDA) and 21 days in CPD, to maintain the quality of the whole blood. [4]

According to Karl Landsteiner we always try to use identical blood groups between donor and recipient. If identical blood groups not available, and there is no blood component present than O positive group of blood can be an issue for men and women above 50 years of age, whereas O negative group of blood shall be an issue for women in a childbearing age. [5]

There is few side effect of blood transfusion, such as transfusion reaction, where we have to stop blood transfusion immediately, and assess patient and do transfusion reaction investigation, other side effects of blood transfusion is hemolytic anemia, febrile non-hemolytic reaction, allergic reaction, circulatory overload, transfusion-associated lung injuries, transfusion-associated graft versus host disease. [6]

OBJECTIVE:

To study the role of the whole blood transfusion in the resuscitation of severe haemorrhagic cases by either causes

MATERIAL & METHODS

This is prospective studies done in the blood bank of A.S.M. college Firozabad, over 6 months, where total unit of whole blood was 850. Requisitions form from their respective department were received and our aim was always to provide same blood group of the whole blood, after Blood group checking by both forward and reverse test tube method, it followed by blood-related transfusion infection checking like Hepatitis B virus (HBV), Hepatitis C virus (HCV), Human Immunodeficiency Virus (HIV) by Enzyme-linked immunoassay method (ELISA), and syphilis and malaria parasite by rapid card test and further followed by compatibility test both by major compatibility and minor compatibility test by the test tube method. This is to maintain the quality of blood transfusion as much as possible. After cross-matching has done, issued the unit of the whole blood and observed the transfusion.

RESULTS

Total Number of units of the whole blood is 850, where voluntary bloods donor units are 588, replacement units are 256 and 6 units are discarded and there is no professional blood donor.

Table 1: Shown number of units of whole blood in study periods.

Total units of blood collection	850
Voluntary blood donors	588
Replacement blood donors	256
Expired blood unit	06

Departments of hospital where the whole blood used in resuscitation are gynae & obstetric department issued 386 units whole blood, paediatric department 150, surgery 215, medicine 77, trauma 10, few other departments (ophthalmology, laryngology, and orthopaedic department) where two units of the whole blood used by each department during the study periods.

Table 2: Shows the unit whole blood distribution in their respective departments

Name of departments	Number of units of the whole blood issued
Obstetrics and Gynaecology	386
Surgery	215
Paediatrics	150
Medicine	77
Trauma	10
Other Departments (ophthalmology, laryngology, and orthopaedic)	06

DISCUSSION

Blood is an essential part of life, still, there is no substitution identified for blood. [7] Blood like transfusion is a basic part of the healthcare system. Blood is kept as a drug, so it has both benefits and risks. Whole blood can be used for resuscitation from haemorrhage by either cause if no component therapy is available because the benefit of blood transfusion is higher than its risk.

In our study unit of the whole blood 850, where voluntary bloods donors is 588 and replacement blood donors is 256 as shown in table 1. In this study, it shows a unit of voluntary blood donors is more than replacement donors, its help in decreasing the chance of blood-related transfer of

infection, and make the blood transfusion safer and effectively. [8] Few unit whole blood bags (6 units) were expired either due to cross the expiry date (4 units) of storage and few were TTI positive (2 units). It was discarded in our blood bank. It was disinfected by autoclave method, where blood bag kept in container allow the heat pass to the liquid at 121 degree centigrade at 15 lbs for 30 minute, record it in register and the bag is sent to the contacted biomedical waste department for further processing.

In the present study the unit of the whole blood used by various departments as shown in table number 2. Department of Obstetrics & Gynaecology (386) are high then the other department, predominantly during the labour period because their haemoglobin is < 7 gm/dl at the time of deliveries, other condition in department of obstetrics and gynae where the whole blood used were during the abortion, postpartum hemorrhage treatment and hysterectomies. According to the National Health Mission (NHM) data, the institutional deliveries in the public sector increases due to the Janani Suraksha Yojana (JSY) program where the public sector deliveries to total institutional deliveries were recorded 92.5%. [8] Their data also shows 47.8% of first-trimester registration to total Antenatal check-up (ANC) registration where only 43.6% of pregnant women received 4 or more ANC check-up to total ANC registration. Another department, for example in Paediatrics where unit of the whole blood used were 150, following treatment such as predominant in correction of anaemia, thalassemia anaemia, few cases of malignancy. We were always tried to provide fresh unit of whole blood (3-5 days after collection of blood, day of collection of blood considered as zero). Ten units of the whole blood were used in Trauma Centre where initial resuscitation was done by fluid administration and correct the bleeding source and if management were failed than followed by whole blood transfusion. This is done to save the scarcity of units of blood

and used it in emergency cases. Other departments where the unit of the whole blood used was Surgery 215, Medicine 77 few others contain Ophthalmology, Laryngology, and Orthopaedic department where 2 units of the whole blood used by each department.

To maintain the quality of blood transfusion as much as possible we were always trying to follow the protocol which were used in our blood bank which is based on, after assure then we issued the blood to their respective department. [9] If any suspicion of transfusion reaction observed than immediately stop the transfusion and send the rest of the whole blood, patient blood sample both in a plain vial and Ethylenediamine tetra acetate (EDTA) vial and patient urine sample sent to the blood bank to check haemolysis by looking haptoglobin, bilirubin, lactate dehydrogenase. The patient sample was taken three times when transfusion reaction suspected, at the time of transfusion reaction, after 24 hours of transfusion and further 48 hours of transfusion. [10] During the study, period we have not noticed any single transfusion-related adverse reaction, and also reported it to hemovigilance.

CONCLUSION

Whole blood can be used as a life-saving, resuscitation of severing haemorrhage cases in a place where blood component is available, This should be done only after careful group matching, compatibility matching, and TTI testing to decrease the risk of transfusion reaction and increase the survival rate.

Conflict Of Interest:

There is no conflict of interest by any authors.

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