

Reasons for discarding blood and blood components in a State of Art Model Blood Bank in a tertiary care teaching hospital



Medical Science

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Dr. Bobby Duarah

Associate Professor, Dept. of Pathology, Assam Medical College & Hospital Dibrugarh Assam

Dr. Luckymoni Duara

Assistant Professor, Dept. of Pathology, Assam Medical College & Hospital Dibrugarh Assam

Dr. Adity Sharma

Professor of Pathology (Blood Bank), Dept. of Pathology, Assam Medical College & Hospital Dibrugarh Assam

Dr. Projnan Saikia

Professor & Head, Dept. of Pathology, Assam Medical College & Hospital Dibrugarh Assam

ABSTRACT

Blood transfusion is an integral part of medical practice. Human blood till date has no substitute. Proper utilization of whole blood and blood components is necessary so that there is minimal wastage. A total of 31655 (voluntary and replacement) donors donating blood in the state of art model blood bank of Assam Medical College and Hospital from 1st January, 2015 to 31st May, 2016 were screened. A total of 763 whole blood bags were discarded out of which 305 (39.97%) bags were discarded due to seropositivity for Transfusion Transmissible Diseases. A total of 385 blood components were discarded against 12794 blood components prepared. Among components most common units discarded were platelets. The most common cause of discarding of blood components was expiry due to non utilization (88.57%). Proper implementation of blood transfusion policies will help to utilize blood in a proper way and to reduce the wastage due to non utilization of the components.

INTRODUCTION :

The transfusion of blood and blood components has become an integral part of patient management in modern medicine^[1]. Much of the medical and surgical emergency procedures depend on the steady supply of blood from healthy individuals. Till date there is no substitute to human blood^[2,3]. So, each unit of blood should be utilized with utmost care with minimal or no wastage. Blood transfusion includes transfusion of whole blood and blood components i.e packed red blood cells, platelet concentrate, fresh frozen plasma (FFP), cryoprecipitate containing clotting factors and WBC. By analyzing the data and the reason for the discards, the Blood Transfusion Services can develop plans to improve performance through education and training of staff and introducing new measures in order to minimize the number of discarded blood to a reasonable rate^[1]. Our aim of present study is to find out the major causes for whole blood and blood component discards to avoid wastage so that, sufficient amount of safe blood can be judiciously used.

MATERIALS AND METHODS:

A prospective study was carried out in the State of Art Model Blood Bank, Assam Medical College and Hospital, Dibrugarh over a period of 17 months from January 15-May 16. Blood donors fulfilling WHO criteria were included in the study. The donors were either voluntary or replacement. Replacement donors were either relative or friends of the patients. Total number of blood bags collected were screened for HIV, HBsAg, HCV, syphilis, malaria using standard methods. The bags that were seropositive for any of the above mentioned transfusion transmissible infections (TTI) were discarded. The expired bags because of non-utilisation, inadequate quantity of collected blood bags showing either hemolysis or turbidity and evidence of leakage were also discarded.

RESULTS :

During the period of study a total of 31655 blood bags were collected. Among the total donors in the blood bank 30719 (97%) were males and 936 (3%) were females. Among

the total donors, 28070 (88.7%) were voluntary donors and 3585 (11.3%) were replacement donors (Table-1).

Table 1 : Source of blood bags as per sex and type of donors

Type of Donors	Male(%)	Female(%)	Total Donors(%)
Voluntary Donors	27230(97%)	840(3%)	28070(88.7%)
Replacement Donors	3489(97.3%)	96(2.7)	3585(11.3%)
Total	30719(97%)	936(3%)	31655(100%)

A 763 (2.41%) out of 31655 whole blood bags were discarded. A total of 305 whole blood bags were discarded due to seropositivity for TTI of which HBsAg was found to be the commonest infection (49.2%) (Table-2)

Table 2 : Analysis of discarded whole blood bags (due to seroreactive cases)

Total discarded(%)	HIV (%)	HBs Ag(%)	HCV(%)	VDRL(%)	MP(%)
305(100%)	26(8.5%)	150(49.2%)	38(12.5%)	84(27.5%)	7(2.3%)

Major cause for discarding whole blood bags was seropositivity for TTI amounting to 305 (39.97%) and HBsAg was found to be the commonest infection. This was followed by expiry or outdated units 300 (39.32%), suboptimal volume due to discontinuation of donation because of donor's disapproval or phlebotomy failure 150 (19.66%), leakage which constituted 8 (1.05%) (Table-3).

Table 3: Analysis of discarded blood bags (whole blood)

Total discarded bags(%)	Seropositive(%)	Date expired(%)	Less volume(%)	Others(%)
763(100%)	305(39.97%)	300(39.32%)	150(19.66%)	8(1.05%)

It was observed that out of a total of 12794 blood components prepared, 385 components were discarded. The commonest component that was discarded was platelet 154 (6.17%) followed by FFP 140 (2.68%) (Table -4).

Table 4: Analysis of discarded units of blood components against total prepared components

Blood components	No. of Blood components prepared	No. of units discarded	Discarded rate(%)
Packed red cells	5085	91	1.79
Platelets	2494	154	6.17
Fresh frozen plasma	5215	140	2.68
Total	12794	385	3.00

The common cause of discarding components was expiry due to non-utilization which constituted of 341(88.57%) followed by seropositivity for TTI and another due to leakage or damage (Table-5).

Table 5: Analysis of reasons for discarding blood components

Blood Components	Reasons for discarding blood components		
	Expired	Leakage	Seropositive for TTIs
Packed red cells	81	-	10
Platelets	150	-	4
Fresh frozen plasma	110	20	10
Total (385)	341	20	24

DISCUSSION :

Like any treatment modalities , blood used correctly and judiciously can save life. In a study by Morish et al^[1] , there was discarding of 2.3% whole blood and its components. Platelet concentrate recorded the highest discard rate at 6% in comparison to other components because of non-utilization .Other causes included leakage(26%) ,inadequate quantity(4%) .In our study, rate of discarding whole blood bags was (2.41%) while the discard rate of platelets concentrate (6.17%) being highest were comparable.

Thakare et al^[4] observed that 3.58% blood bags were discarded and the main reason was positivity for TTI constituting 68.86% .The common TTI was HBsAg (49.82%), 10% for HIV , 8.97% for HCV and no positivity for VDRL. In our study rate of discarding due to seropositivity was lower(39.97%) and Hepatitis B was commonest TTI.

A study by Gauravi et al^[5] , found that 226(2.86%) of the total 7882 units were discarded due to seropositivity for TTI in the year 2008. In the year 2009 , 178 (2.18%) bags were discarded due to seropositivity for TTI out of 8141 units collected and in 2010, 212 (2.24%) out of a total of 9441 blood bags were discarded for seropositivity for TTI. Our study shows slightly lower discard 305 bags (0.96%) due to seropositivity for TTI out of a total of 31655 blood bags.

In a study carried by Chitnis et al^[6] the monthly discard rate of blood components was 10% which were seropositive for HIV ,HBsAg ,HCV or contamination or reactions to recipients and non-utilisation leading to expiry. In our study monthly discard rate of blood components was 3% for non utilization, seropositivity and leakage etc.

According to Kumar et al^[7] 3.25% of whole blood were discarded and the reason was positivity for TTI of which HBsAg was commonest .Regarding blood components platelets were the common to discard .Our study shows similar findings with highest discarding rate of platelets concentrate and that is because of non utilization.

Sharma et al^[8] observed that 446(4.46%) whole blood bags against 10012 were discarded and the common cause was positivity for TTI followed by inadequate quan-

tity, leakage or damage .Platelets were the most common components to be discarded . In our study a 763 (2.41 %) whole blood bags were discarded . Major cause for discarding whole blood bags was seropositivity for TTI 305(39.97%), followed by expiry or outdated units 300(39.32%), suboptimal volume due to discontinuation of donation because of donor's disapproval or phlebotomy failure 150 (19.66%) ,leakage constituting of 8(1.05%).Our study also shows platelets were the most common component to be discarded.

In another study by Deb et al ^[9] the common component to be discarded was platelet concentrate and the reason behind was non utilization which were similar to our findings.

CONCLUSION:

Proper blood bank management will reduce the rate of discard of blood and its components and improve the efficiency of Blood Transfusion Services . Since the common cause of discarding blood and its components was Transfusion Transmitted Infection(TTI) , it needs to double its efforts to collect sufficient amount of safe blood from voluntary , healthy donors and a thorough screening will help in minimal discarding of collected bags . Reducing the amount of discarded blood can contribute towards decreasing the total cost of blood and its components.

REFERENCES:

1. Morish M , Ayob Y, Naim N , Salman H, Muhamad NA ,Yusoff NM. Quality indicators for discarding blood in the National Blood Center ,Kuala Lumpur. Asian J Transfusion Sci 2012;6: 19-23.
2. Zmijewski CM ,Walter EH .Blood Banking Science ,New York. Appleton Century Croft 1982.
3. An action plan for blood safety,New Delhi. National AIDS Control Organization,Ministry of Health and Family Welfare ,Government of India MOHFW, 2003.
4. Thakare MM, Dixit JV ,Goel NK .Reasons for discarding blood from blood bank of Government Medical College, Aurangabad. Asian J Transfusion Sci 2011;5:59-60.
5. Gauravi D, Agravat A, Krupal MP. Seroprevalance of HIV,HBV,HCV and syphilis in blood donors in Saurashtra region of Gujarat. Declining trends over a period of 31/2 years. Online J Health Allied Sci 2012;11:5.
6. Chitnis V, Vaidya K,Chitnis DS. Biomedical waste in laboratory medicine Audit and management. Indian J Med Microbiol 2005;23:6-13.
7. KumarA, Sharma SM, Ingole NS, Gangane N. Analysis of reasons for discarding blood and blood components in a blood bank of tertiary care hospital in central India: a prospective study. Int J Med Public Health 2014;4:72-4.
8. Sharma N, Kaushik S, Kumar R, Azad S, Acharya S, Kudesia S .Causes of wastage of blood and blood components: A Retrospective Analysis. IOSR Journal of Dental and Medical Sciences 2014;13(12):59-61.
9. Deb P, Swarup D, Singh MM. Two corps blood supply unit, 56 APO audit of blood requisition. Med J Armed Forces India 2001;57:35-8.