

ORIGINAL RESEARCH ARTICLE

**Analysis of reasons of Discards of Blood and Blood Products in a
Tertiary Care Hospital**

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Abstract:

Background: The demand of blood and blood components outspace its supply. The wastage of this precious unit can be reduced with more efficient utilization of blood. Self-audit of blood bank of discard rate of blood and blood components is needed to minimize wastage.

Aims: present study aims at finding reasons for discarding blood and blood components and develop plans minimize wastage of blood.

Materials and methods: The present retrospective study of blood bank is carried over a period of 1 year in tertiary care hospital. Data about discarded blood units were taken from discard and autoclave register which include analysis of all factors responsible for discarding blood and blood components. The discard rate was then calculated using appropriate formula.

Results: In the study period out of 4379 whole blood units 250 whole blood were discarded which accounts for the discard rate of 5.7%. Seropositivity due to transfusion transmitted (TTI) infections was the main reason for discarding these units account for 57.6%. The total number of components prepared during the study period was 7784; and out of these 1489 were discarded accounting for 19.1% discard rate. Amongst components the highest discard rate was for platelets (54.67%).

Conclusion:

From our study it was found the discard rate of blood is higher in our institute. It is important to implement blood transfusion policies strictly to minimize wastage of blood. Hospital Transfusion Committee should monitor the rational use of blood components to reduce discard rate

Keywords

Discard, Blood Components, Retrospective, Seropositivity, Policies

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Introduction:

Blood Transfusion plays a vital part in health care system without which efficient medical care is not possible. [1] Blood is needed for many surgical and medical emergency procedures and till date there are no substitutes for human blood. [2, 3] Always the demand of blood and blood components outpace its supply. It is important that each unit of blood should be utilized with utmost care with minimal wastage. The efficiency of blood component preparation is monitored by establishing quality indicators which evaluate various activities. One such indicator is discard rate of blood components. When the discard rate of blood is high, the level of efficiency of components preparation process lowers. [4] Blood bank can improve performance by formulating protocols for minimizing the wastage by analyzing data and causes of blood discard. [5] Thereby train the blood bank staff to implement new measures to reduce rate of discard to reasonable rate. [6] Self-audit of

blood bank of discard rate of blood and blood components can give us insight into various avoidable and non-avoidable reasons of discard. The present study was aimed to find out various reasons for discarding blood and blood components and to develop plans to minimize wastage.

Material and methods:

Study design

The present study of blood bank is carried out over a period of 1 year that is (January 2018-December 2018) in tertiary care center in central region of India.

Type of study

It is a retrospective study and the information of donors and recipients is taken from the donor and issue records which are maintained by blood bank staff. Blood was collected from voluntary donors coming to in-house (in blood bank) and also from outdoor blood donation camps. Total blood units collected and total no of components like packed red cell concentrate (PRC), fresh frozen plasma (FFP) and platelet concentrate (PC) prepared in this year were noted. Blood components were prepared from 350/450 ml blood bags under all aseptic conditions according to Food and Drug Administration (FDA) guidelines.[7] As the manpower in the blood bank was less the components were prepared as per the demand and not on regular basis. Data about all discarded blood units were taken from discard and autoclave register which include analysis of all factors responsible for discarding blood and blood components. All blood units were screened for five transfusion transmitted infections Human immunodeficiency virus (HIV), Hepatitis B surface antigen (HBSAg), Hepatitis C virus (HCV), Syphilis and Malaria. For the screening of blood units for HIV, HCV antibodies and HBSAg commercially available Government approved enzyme linked immunosorbent assay (ELISA) were used. Screening for syphilis and malaria were carried out by rapid card i.e. VDRL rapid card (Venereal Disease Research Laboratory) and malaria antigen rapid card methods respectively as per the manufacturer's instructions. The blood units which were found positive for any of the five transfusions transmitted infections were discarded by standard autoclaving procedure. The expired blood units because of non-utilization, less quantity of collected blood, bags showing

either hemolytic or turbidity or any evidence of leakage and clotted and lipaemic blood bags were also discarded. The discard rate was then calculated using following formula.

1) Discard rate of whole blood = Number of whole blood units discarded over 1 year /no of whole blood units collected over that year x 100.

2) Discard rate of blood component= Number of blood components discarded over 1 year /no of blood components prepared over that year x 100.

Results:

Table No1. Table shows Sex wise distribution of donors

	Male donors	Female donors	Total donors
Total collection in camps	4105 (90.67%)	422 (9.3%)	4527(62.96%)
Total collection in blood bank	2062 (77.43%)	601 (22.56%)	2663(37.03%)
Total collection	6167 (85.77%)	1023 (14.22%)	7190 (100%)

Table No 2. Table shows reasons of discarding of whole blood due to seropositivity

Total discarded	HIV positive	HBS Ag positive	HCV positive	VDRL positive	MP positive
144	41(28.47%)	90(62.5%)	11(7.6%)	1(0.6%)	1(0.6%)

Table No 3. Table shows distribution of causes of discarding of whole blood

Total bags discarded	Seropositive bags	Less bags	Expired bags	Other reasons
250	144(57.6%)	90(36%)	11(4.4%)	5(2%)

Table No 4. Table shows total no of components prepared and total no of components discarded

Blood component	Blood component prepared	Total component discarded	Discard rate
Packed red cells	2811	126	4.4%
Platelet concentrate	2162	1182	54.67%
Fresh frozen plasma	2811	181	6.4%
Total	7784	1489	19.1%

Table No 5. Table shows distribution of causes of discarding of components

Component	Causes of discard			
	Seropositive bags	Leakage	Expired bags	Other reasons
Packed red cells	113	-	13	-
Platelet concentrate	96	-	1086	6 (RBC Contaminated)
Fresh frozen plasma	113	42	26	-
Total (1495)	322 (21.5%)	42(2.80%)	1125 (75.25%)	6 (0.4%)

Among the total collection 7190 blood units 4527(62.96%) were collected in-house that is in blood bank and 2663(37.03%) were collected in blood bank (Table no 1) which were either voluntary donors or the relatives of the patient who donated voluntarily after counseling about blood donation.

Out of total 7190 collection 6167 (85.77%) were male donors and 1023 (14.22%) were female donors as shown in Table no 1. In the year 2018 out of total 7190 whole blood collection 2811 bags were separated in to components and remaining 4379 bags were kept as whole blood units. Out of these 4379 whole blood units 250 whole blood were discarded which accounts for the discard rate of 5.7% for whole blood. Seropositivity due to transfusion transmitted (TTI) infections was the main reason for discarding these units which account for 144 bags that is 57.6%. Amongst these TTI positive units highest TTI positivity was for HBS Ag (62.5%) followed by HIV (28.47%) and HCV (7.6%) as shown in Table 2. Only two units were positive for syphilis and malaria contributing to 0.6% each. [Table 2] .Table no 3 shows other reasons for discarding blood like less quantity of blood in bags(36%), expired bags due to non utilization(4.4%) and other reasons of discard like leakage, hemolysis (2%) . The total number of components prepared during the study period was 7784; and out of these 1489 were discarded accounting for 19.1% discard rate. The highest discard rate was for platelets (54.67%) followed by fresh frozen plasma (FFP) (6.4%) as mentioned in Table 4. Table no 5 shows the reasons for discard for blood components and it was found expiry due to non utilizations (75.25%) constituting for the main reason for discard followed by seropositivity for transfusion transmitted infection (21.5%) followed by leakage.

Discussion:

Blood transfusion services are an integral part of modern healthcare and therapy and are needed for supply of continuous, adequate and safe blood. For better patient care and better healthcare of country a well organized Blood transfusion services are needed [8]. Considering the high cost issue for preparing blood and blood products, it is necessary that these services should ensure rational and judicious use of blood with minimal discard rate.

Study done by Kumar et al [9] shows a discard rate of 3.25% for whole blood. The major contributing factor for the discard of these blood bags was seropositivity for transfusion transmitted infections(TTI) (74.30%) followed by expired bags due to non utilization (11.84%), less bags (5.20%) and other reasons like yellowish discoloration of plasma, signs of hemolysis noted in blood bags (8.66%). Amongst the TTI positivity highest positivity was for HBS Ag (69.64%) followed by HIV (19.84%), HCV (8.18%) and syphilis (2.34%) respectively. Discard rate of whole blood in our study 5.7%; is higher than this study and the main reason of discard in our study is seropositivity for

transfusion transmitted infections (TTI). Proper donor screening with strict adherence to the standard operative procedure for donor screening and counseling would lower the collection of TTI positive units from the donors thereby lowering the discard rate. In a study conducted by Thakare et al [10] in blood bank of Government medical college, Aurangabad, India it was found that on average 3.58% units of whole blood were discarded. Main reasons for discarding in this study were also positivity for TTI (68.86%). Most common TTI was hepatitis B (49.82%) followed by HIV (10%) and HCV (8.97%) as like our study. Deb et al [11] showed a discard rate of 14.61%. The high rate of discard in this study was because of non utilization of the blood units. Out of total 292 discarded units 242 units were discarded due to non-utilization. Present study show the highest discard rate was for platelets (54.67%) which is in concordance with Maramazi Ghaklez B. et al[12] who quoted discard rate of platelet 58.1% but was greater than that described by Bobade et al[13] (26.2%). The main reason of discard of platelets in present study was expiry (75.25%) which is because of short shelf life of platelets of five days. To minimize this discard, platelets should be prepared on demand; Using techniques like aphaeresis.

Conclusion:

From our study it was found the discard rate of blood is higher in our institute. It is important to implement blood transfusion policies strictly to minimize wastage of blood. There needs to be coordination between hospital and blood bank staff. Seropositivity to TTI can be reduced by adhering to strict donor screening guidelines and proper donor counseling. Hospital Transfusion Committee should monitor the rational use of blood components to reduce the discarding of bags due to expiry.

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