

Causes of Wastage of Blood and Blood Components: A Retrospective Analysis

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Abstract: Blood transfusion is an integral part of medical practice and is required in many surgical procedures. Human blood till date has no substitute. This emphasizes the very judicious use of blood and its components and minimal or no wastage. Total 10012 (voluntary and replacement) donors were included from August 2011 to Feb. 2014 and screened for transfusion transmissible disease. A total of 10012 blood units were collected but 446 (4.46%) of whole blood bags were discarded either because of seroreactivity, expiry or low volume. One thousand and nine(8.69%) component were discarded out of the 19648 blood components prepared .The commonest cause was expiry of the components 915(54.5%) especially the platelets because of short self life and non utilization, followed by leakage /damage which constituted 428(25.5%) of the discarded components. Three hundred and thirty seven (20.0%) the components were discarded because of seropositivity for Transfusion transmissible diseases(TTI). Strict adherence to the WHO selection and deferral criteria of donors along with proper phlebotomy technique will help to reduce the number of discarding bags because of TTI and low quantity from total collected units. Proper implementation of blood transfusion policy will helps to reduce the wastage due to non utilization of components.

Key Words: Whole blood, blood components, donors, discarded

I. Introduction

Blood transfusion is an integral part of medical practice. It includes transfusion of whole Blood and blood components i.e. Packed RBC, WBC, Fresh frozen plasma, cryoprecipitate containing clotting factors, and platelets concentrate. Majority of the surgical procedures require blood transfusion. Human blood till date has no substitute^{[1][2]}. Demand of blood and its components always outpace its supply .This emphasizes the need for proper utilization of blood and its components with preferably “No” or minimal wastage. In the present study, we aim to find out the main causes for discarding whole blood or components so that the wastage can be minimized and sufficient amount of safe blood can be supplied, whenever it is required.

II. Material & Method

A retrospective study was carried out in the blood bank of Shri Mahant Indires Hospital attached with Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun, Uttarakhand, India from August 2011 to Feb. 2014 .It involved analysis of various factors responsible for discarding of blood and blood components . Blood donations included in the study fulfilled the selection criteria as defined by WHO.

Total number of blood bags collected during this period were noted .All these bags were screened for HIV, HBsAg, anti HCV ,syphilis and malaria using standard methods .The bags that were seropositive for any of the mentioned transfusion transmitted disease (TTI) were discarded .The expired blood bags , those having inadequate quantity of collected blood or bags showing signs of haemolysis or turbidity /evidence of leakage were also discarded.

III. Results

It was Observed that a total of 10012 blood bags were collected in the study period. Of the total donors in the blood bank, 8915(89.04%) were males and 1127(10.95%) were females. About 8694 (86.8%) were voluntary donations and 1318 (13.2%) were from replacement donations. [Table-1]

Table I Source of blood obtained as per sex and type of donors.

Type of donors	Male	Female	Total Donors
Voluntary	7648	1076	8694 (86.8%)
Replacement	1267	51	1318(13.2%)
Total	8915 (89.04%)	1127 (10.95%)	10012 (100%)

Of the 10012 donations,446 (4.46%) of whole blood bags were discarded.Seropositivity for TTI constituted the major cause of whole blood bags rejection 261 (58.5%).Seropositivity for HBsAg was the commonest. This was followed by low quantity, leakage/damage which constituted 160(35.8%) [Table-2 and 3]

Table -2 Analysis of discarded whole blood bags

TOTAL	Seropositive	Date expired	Low Quantity	Damage and others
Discarded bags	261 (58.5%)	25(5.6%)	154(34.5%)	6(1.3 %)

Table 3- Analysis of Discarded bags due to seroreactive causes

TTI	HIV	HBsAg	HCV	VDRL	MP
Packed Red cells	10	65	39	15	02
FFP	07	17	34	63	00
Platelets	01	03	05	00	00
Total	18 (6.8%)	85 (32.5%)	78 (29.8%)	78 (29.8%)	02 (0.7%)

A Total of 19648 blood components were prepared during this study period out of which 1709 component were discarded .The most common blood Component discarded were platelets (43.6%) followed by FFP(6.2%) [Table-4]

Table 4 Analysis of discarded units of blood components

Blood Components	No. Of components	No. of units discarded	Discard rate(%)
Packed red cells	8926	286	3.2%
FFP	8712	545	6.2%
Platelets	2010	878	43.6%
Total	19648	1709	8.69%

Platelet concentrates with a short shelf life were discarded the most (930 platelet bags amounting 54.5% of total rejections) when not utilized. Four hundred thirty eight (25.6 %) were discarded due to leakage /damage of bags and another 341(20.0%) because of seropositivity for TTI [Table-5]

Table -5 Reasons for discarding blood components

Total discarded	Expired	Leakage/ Damage	Sero positivity to TTI
PRBC	45	6	205
FFP	00	432	123
Platelets	885	00	14
Total	930(54.5%)	438(25.6%)	341(20.0%)

IV. Discussion

Morish et al, Kuala Lumpur ^[3] studied that total percentage of discarded whole blood & its components was 2.3%. Platelets concentrate recorded the highest discard rate - 6% because of non utilization and (40%) due to RBC contamination. Other causes included leakage (26%), lipemia (25%) and low quantity (4%). In our study, rate of discarding whole blood bags was slightly higher (4.46%) while discard rate of platelets concentrate (43.6%) and because of leakage (26%)were comparable.

Study conducted by Thakare et al ^[4] in blood bank of Government medical college, Aurangabad,India found that on average 3.58% units of blood were discarded over a period of 3 years. Main reasons for discarding was positivity for TTI constituting 68.86%. Most common TTI was hepatitis B (49.82%) followed by HIV (10%) and HCV (8.97%). In our study rate of discarding due to seroreactivity were 58.6% and Hepatitis B was the commonest TTI.

Gauravi et al^[5], Gujrat,India founded that 226(2.86%) blood bags were discarded because of seropositivity for TTI against 7882 blood bags collected in year 2008. In years 2009, 178 (2.18%) bags were discarded due to seropositivity for TTI against 8141 blood bags collected and in year 2010, 212 (2.24%) blood bags were discarded because of seropositivity for TTI out of total 9441 bags collected .Our study also show almost similar results i.e. seropositivity (2.60%).

Chitins et al ^[6] at Indore conducted one study in Choithram Hospital and Research Centre which revealed that about 10% of component bags were discarded monthly because of seropositivity for HIV, HBsAg, HCV or contamination or reactions to recipients and expiry. In our study also 8.96 % components bags were seroreactive and were discarded.

In studies conducted by Kumar et al ^[7] and Deb et al ^[8] the most common components discarded were platelets and were non utilized. Similar findings were observed by us. Our study also found highest discarding rates of platelets concentrate and that is because of non utilization.

V. Conclusion

Our study revealed that the discard rate of whole blood bags was 4.46% and the most common component discarded were platelets due to non utilization. Our observations were comparable to most other similar studies.

Blood being an irreplaceable resource needs to be properly utilized ideally zero percent wastage. Proper implementation of blood transfusion policies will help in minimizing discard rate due to non utilization of blood/ components. Seropositivity of TTI can be reduced further by proper interview of donors while proper

blood collection technique along with continued training of phlebotomy staff will go a long way in reducing rejection due to inadequate quantity.

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