Research Article

Analysis of Rate and Reasons of Discarding of Blood and its Components in Tertiary Care Hospital Blood Bank

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Received: 14-04-2022; **Revised:** 22-06-2022; **Accepted:** 29-06-2022; **Published on:** 15-07-2022.

ABSTRACT

Transfusion of blood and its components is integral part of patient health care management in today's era. The blood and the blood components have no complete substitute till date. Therefore, every unit of blood and its components are very precious and should be utilized very cautiously. The blood components wastage is an important issue in health care system. The blood components wastage is generally due to poorly managed stock, poor storage, transportation along with local reasons of the respective blood bank. The present study was undertaken to analyze rate and the reasons of the discard of blood and blood components in tertiary care hospital blood bank for the period from January 2017 to December 2021. In the present study, the blood components discard rate was 4.46%. The discard rate of platelets was highest with 35.79%. The discard rate of whole blood, packed cells, Fresh Frozen Plasma (FFP) was 6.55%, 0.84% and 2.90% respectively. The shortest shelf life was the reason for the platelets discard and attributed to its highest discard rate. The other reasons of discard of blood components were transfusion transmitted infections (TTI), leakage, expiry, low volume etc. The large scale study to be conducted for identification of causes and percentage of blood components wastage and targeted intervention is needed for the effective reduction of blood components wastage.

Keywords: Blood components wastage, discard rate, whole blood, packed cells, platelets, FFP.

QUICK RESPONSE CODE →

DOI: 10.47583/ijpsrr.2022.v75i01.020

DOI link: http://dx.doi.org/10.47583/ijpsrr.2022.v75i01.020

INTRODUCTION

Blood transfusion is important component in the modern health care system. Transfusion of blood and blood components (packed cells, platelets and FFP) is routinely done in day-today procedures in any hospital. Till date, there is no complete substitute for the blood and blood components.[1] Hence, blood needs to be appropriately utilized with minimal or no percentage of wastage. [2]

As per WHO reports, every year the blood components wastage is around 5 million blood units.[3] In India, total 1.18 million units of blood and blood components were discarded by all the blood banks across the country in year 2016-2017. [4] The blood discard led to financial loss of health care system along with loss of noble precious donated blood by the donor.

The present study was done to find out reasons and rate of blood components discard in tertiary care hospital blood bank. In the present study, we found, the blood discard rate was 4.46%. In the studies conducted by Morish M et al [5], Kora SA et al [6], Suresh B et al [7] and Patil P et al [8] showed the discard rate of whole blood and its components was 2.3%, 4.3%, 7.0%, 20.6% respectively in their studies.

As per WHO, the poor management, poor storage and transportation are the most common reasons of blood components wastage.[3] The other factors like shelf life expiry, quality control issues, sero-positivity also lead to blood components discard.[9] In the present study, we found TTI, leakage, shelf life expiry was the reasons of blood and blood components discard. The multistep approach is needed to minimize the blood components wastage. The areas of donor management, blood storage, blood transportation, communication between blood bank staff and hospital staff, seminars for rational use of blood etc. are needed to focus for to achieve minimum discard of blood components.

MATERIALS AND METHODS

The study was conducted in tertiary care hospital blood bank for the period from January 2017 to December 2021. As per mandatory FDA guidelines, the blood donor selection criteria implemented for blood donor selection and blood components such as packed cells, FFP and platelets were prepared from this collected blood bags.[10] The National AIDS Control Organization (NACO) defined standard operating procedures were implemented for discarding of blood bags. [11] The present study data was collected from blood bank registers. The donor record register for donor details, component preparation register for components (Packed cells, FFP, platelets) preparation, TTI register for sero-positivity details and discard register for components discard details were utilized. The reasons

of blood components shelf life expiry, sero-positivity, low volume, leakage were analyzed for blood discard details.

RESULTS AND DISCUSSION

The blood bank registers for blood donor details and blood discard were analyzed for the period of January 2017 to December 2021. (Table 1)

Table 1: Analysis of discard units of blood components

Blood component	Number of units prepared	Number of units discarded	Discard rate
Whole blood	183	12	6.55%
Packed cells	7362	62	0.84%
FFP	7362	214	2.90%
Platelets	1207	432	35.79%
Total	16114	720	4.46%

Total 16114 units of blood components were prepared in the blood bank. Total 183 units of whole blood, 7362 units of packed cells, 7362 units of FFP and 1207 units of platelets were prepared. Total 720 units of blood components (4.46%) were discarded. The discard rate for whole blood, packed cells, FFP and platelets were 6.55%, 0.84%, 2.90% and 35.79% respectively. (Table 1)

Table 2: Analysis of reasons for discarding blood components

Blood component	Shelf-life Expiry	TTI	Leakage	Low volume
Whole blood	06	02	-	04
Packed cells	36	18	-	08
FFP	96	54	45	19
Platelets	376	22	21	13
Total	514 (71.38%)	96 (13.33%)	66 (10.09%)	44 (0.06%)

The reasons of blood components discarding were shelf life expiry, TTI, leakage and low volume with 71.38%, 13.33%, 10.09% and 0.06% respectively. (Table 2)

In the present study, we found the total discard rate for blood components was 4.46%. Similar type of low discard rate was found by Thakare MM et al [12], Kora SA et al [6] and Morish M et al [5] with 3.6%, 2.3% and 4.3% in their studies. The study done by Patil P et al showed the higher blood discard rate of 20.6%.[8]

In the present study, we found the shelf-life expiry with 71.38%, was the most common reason of blood components discard. Similar type of findings was observed in the study done by Kumar A et al [2] and Patil P et al [8] which showed that the blood components were discarded due to expiry date reason were 57.8% and 53.0% respectively.

The rational use of blood components will reduce the blood wastage and save the lives of many patients. Hence, judicious use of blood components is warranted in view of increasing demand. Need of blood components increasing everyday with newer advancements in treatment modalities.

Blood discard rates serve as important quality indicator and is a proportion of total discarded blood components against total collected blood units. The blood discard guidelines are issued by World Health Organization (WHO).[13]

The multifaceted approaches to reduce the blood components wastage have to be applied in strategic manner. The donor recruitment, blood collection and components preparation to be adjusted as per the blood components requirements from the hospital. The blood donation camps should be organized as per the need and availability of blood stock in blood bank. The strict adherence of the blood donor selection criteria will reduce TTI positivity. The continuous education programs of blood bank staff to organized in periodic manner for standard methodologies of donor blood collection, processing, storage and transportation. The blood components to be issued with FIFO policy (First in First out) and has to be audited regularly by hospital transfusion committee to reduce shelf life expiry reasoned blood components wastage. The blood bank equipment's should be calibrated and validated regularly. The good communication between blood bank technical staff and hospital clinicians is needed.[14]

CONCLUSION

The blood and blood components are essential drugs. As they are an irreplaceable, they should be utilized properly and judiciously. The unutilized discarded blood bags are harmful to blood bank financially as well as socially. For minimal wastage of blood components, maximum care should be taken at collection, processing, storage and issue. The proper implementation of blood transfusion policy and co-ordination between blood bank staff and hospital staff will reduce the blood discard and blood wastage. The continuous medical education (CME) to be conducted for sensitization of clinicians, resident doctors for rational utilization of blood components. The periodical training for technical staff and regular audit by hospital transfusion committee will also reduce the blood wastage. All these measures will improve the internal quality control, reduce blood wastage and will help for better functioning of blood bank.

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Source of Support: The author(s) received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.