

## Study on Causes of Wastage of Blood at the Public and Private Hospitals of Pakistan

Rashid Azeem\*, Kamran Khan, Fareeha Azeem, Muhammad Idrees,  
Noor Saba, Saira Nasr Malik

Peshawar Institute of Cardiology, Pakistan

\*Corresponding Author: Rashid Azeem, Assistant Professor Hematology,

Peshawar Institute of Cardiology, Pakistan.

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*et al.*

### Abstract

**Background:** Blood transfusion is a significant therapeutic intervention for human life. There is no replacement of human blood till date. Wastage of blood in blood banks is a serious problem which needs to be addressed in order to overcome the shortage of blood and improved utilization can be done of this limited resource.

**Objective:** To evaluate discard of blood and its components in public and private blood banks of Peshawar.

**Materials and Methods:** A retrospective cross-sectional descriptive study conducted for the duration of two years i.e. 1<sup>st</sup> Jan 2012 to 31<sup>st</sup> Dec 2013. Data about wastage of blood products were obtained from 6 public sector, 1 private and 2 standalone blood banks information system. Analysis of data include frequency and causes of wastage of blood bags. Blood donations in this study had followed the recommended criteria by WHO. All the blood bags collected in the study period were recorded. Screening of blood bags were done for TTIs by recommended methods. Seropositive blood bags for TTIs were discarded along with outdated, low quantity of blood, leakage, damage, turbidity, hemolysis and clotting were also discarded.

**Results:** A total of 204942 blood bags were collected from blood banks during the study period. About 7.3% of blood bags were discarded of the total donations. Majority of the blood donors were replacement donors 87.6% followed by voluntary donors 12.3%. The main reason for discarding blood in our study was seropositivity for transfusion transmitted infections (53.6%) followed by outdated bags (40.0%) and then low quantity of blood in bags (2.6%) and then leakage (1.9%) and others (damage, hemolysis, turbidity, clot) 0.2%.

**Conclusion:** The current study identified seropositivity for TTIs, expired date and low quantity of blood as the main reasons for discarding blood bags. This study recommends for the development of strategies in order to reduce wastage as well as optimal use of blood. As blood products are perishable, supervision of blood stock should be done in a way which prevents waste as much as possible.

**Keywords:** Blood; Transfusion Transmitted Infections

### Introduction

Blood transfusion is a significant therapeutic intervention for human life. Health incidents in the industrial world nowadays

faced increase utilization of blood components [1]. Several factors are involved in shortfall of supply of blood including deficient recruitment of donors and inappropriate management of the blood

stock [2]. It has been proven by the data of WHO that 87.5% of developing countries are collecting less than half of the blood required for the needs of those countries [3]. There is no replacement of human blood till date [4]. Strategies should be formed and followed for appropriate usage of blood and its components in order to overcome the shortage of blood and improved utilization can be done of this limited resource [5].

Wastage of blood in blood banks is a serious problem which needs to be addressed. Various causes are involved in wastage of blood. Outdating and wastage of blood products should not occur in ideal setups [6]. Main factors leading to disposal of blood and its components include seropositivity for transfusion transmitted infections, outdated units, broken cold chain, low quantity of blood and hemolyzed, clotted, damage to bags and seals [7]. British Guidelines has recommended to follow "30-minute rule" for transfusion of red blood cells [8]. The reason is that RBC units warms up when they are not in controlled temperature storage and increases risk of bacterial growth with time [9]. Low quantity of blood is result of acute donor reactions and unskilled personnel collecting blood [10]. In order to achieve zero percent wastage interventions which are easy and inexpensive should be implemented through a structured program. These include educational sessions, digital and print messaging, stringent donor selection and maintenance of cold chain [11,12].

Safety of blood transfusion is of utmost importance. One of the main factor required for the availability of safe blood is blood donation from voluntary donors rather than replacement donors. Voluntary blood donation is a limited resource which requires effective management [13]. It has been proven in many studies that prevalence of TTIs is much higher in replacement rather than voluntary donors [14]. In countries like Pakistan where no irradiation, leukodepletion and pathogen inactivation methods are used and detection of TTIs is still dependent upto now on serological testing rather than NAIT are more at risk. Therefore, in order to ensure safe blood transfusion efforts should be made to increase the recruitment of voluntary donor population [10].

It is of utmost consideration to be notified that upto now a limited countries have utilized the important structures required in blood banks.<sup>6</sup> For improvement and standardization to occur, a scientific protocol should be made covering all the aspects of blood

bank including analysis of setups in the country, demand and supply of blood wastage, proper conditions for storage, timely use of blood products, voluntary blood donors recruitment and retention. By implementation of protocol helps in prevention of loss of blood components as well as financial resources [15].

Blood wastage is a universal problem in hospitals. The aim of the present study is to determine the frequency and causes of wasted blood at different hospitals in Pakistan which will help in addressing of this issue throughout the hospitals in general. This study will help in designing and implementation of programs and measures to prevent and reduce wastage of blood in future.

### Materials and Methods

A retrospective cross-sectional descriptive study conducted for the duration of two years i.e. 1<sup>st</sup> Jan 2012 to 31<sup>st</sup> Dec 2013. Data about wastage of blood products were obtained from 6 public sector, 1 private and 2 standalone blood banks information system. Analysis of data include frequency and causes of wastage of blood bags. Blood donations in this study had followed the recommended criteria by WHO.

All the blood bags collected in the study period were recorded. Screening of blood bags were done for TTIs by recommended methods. Seropositive blood bags for TTIs were discarded along with outdated, low quantity of blood, leakage, damage, turbidity, hemolysis and clotting were also discarded.

### Results

A total of 204942 blood bags were collected from blood banks during the study period. About 7.3% of blood bags were discarded of the total 204942 donations.

### Discussion

Assessment of the frequency and the causes of wastage of blood products over a period of time helps to determine the necessary modifications and improvements to be done in order to reduce wastage. In developing countries like Pakistan who are encountering limitations of supply of blood, proper clinical use of blood is required along with strategies to reduce discarding of blood units.

In the present study about 7.3% of blood bags were discarded. This is similar to result of study from India (6.6%) [16] while it is

Figure 1: Types of donors.

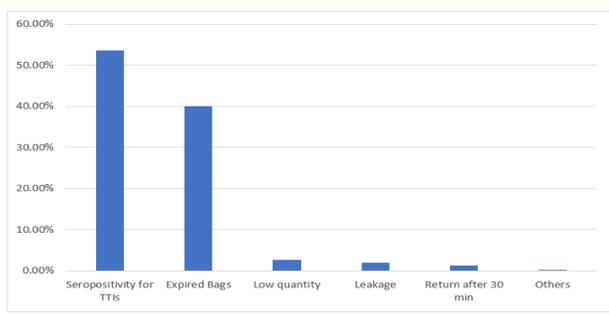


Figure 2: Causes of discarded blood bags.

higher than other studies conducted by Arora, *et al.* [17] and Morish, *et al.* (2.3%) [1]. The wastage of blood products in our study is also higher in comparison to studies conducted in UK (3%) [18] and Subsaharan Africa (1.83%) [19]. Monitoring of blood wastage should be done and development of strategies to reduce the discarded percentage of blood components should be now our priority. It has been demonstrated that interventions to identify causes and preventive methods to reduce blood wastage had significant impact [16].

Our study showed different causes for wastage of blood products. The main reason for discarding blood in our study was seropositivity for transfusion transmitted infections (53.6%) followed

by outdated bags (40.0%) and then low quantity of blood in bags (2.6%) and then leakage (1.9%) and others (damage, hemolysis, turbidity, clot) 0.2%. Seropositivity for TTIs was also the most significant factor for wastage of blood products in India (58.5%) [19]. In comparison to other studies, results from Subsharan Africa [19], Uk [18], South America [21] and India demonstrated that discarding of blood products was attributable to expiration of blood products rather than seropositivity for TTIs.

Multifactorial approach should be adopted to reduce unnecessary blood wastage. It includes development of a better inventory management among existing practices along with understanding of the factors responsible for wastage of blood products which may vary among health providers and types of blood products [17]. As seropositivity for TTIs was the major reason for wastage of blood products which should be addressed to reduce it. Stringent donor selection should be followed and monitored to get desired wastage [5]. Expired blood products was the second main reason for wastage of blood components, so keeping in view their short half lifes effective policies should be developed to monitor blood bank inventory and also analyze factors resulting in storage of blood until their expiry date [8].

Majority of blood donations in our study were from replacement donors (87.6%) followed by voluntary donors (12.3%). Only 14.81% voluntary donations were done, rest were all replacement (83.19%) as demonstrated in study from India [19]. Voluntary blood donation is very less which needs consideration. Measures should be undertaken to facilitate and recruit voluntary blood donors as it has been demonstrated that prevalence of TTIs is much higher in replacement rather than voluntary donors [12].

### Conclusion

The current study identified seropositivity for TTIs, expired date and low quantity of blood as the main reasons for discarding blood bags. This study recommends for the development of strategies in order to reduce wastage as well as optimal use of blood. As blood products are perishable, supervision of blood stock should be done in a way which prevents waste as much as possible.

The advantage of this study is that it is the first comprehensive study including all the major blood banks of hospital in Northern Pakistan and wide number of reasons of discard of blood products were analyzed.

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