

A Pilot Study of Utilization of Blood Components at Tertiary Care Centre, Rajkot

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ABSTRACT

Background: Blood is essential for life. It contains cellular component and plasma which supplies oxygen, nutrients to different parts of the body. Transfusion of blood and blood components is an integral part of health care practice. Many a times there will be injudicious use of blood and its products among patients which causes unnecessary burden to the patients as well to blood bank. Main aim of this study is to evaluate the pattern of utilization of blood components in tertiary care hospital at Rajkot.

Methods: This was retrospective study carried out over a period of 1 year from January 2017 to December 2017. All the data were collected from blood bank.

Result: Total number of the blood components utilized in the year 2017 was 22290. The most utilized blood component included of Red Cell Concentrate (RCC) followed by Fresh Frozen Plasma (FFP) and Platelet Concentrate respectively. Cryoprecipitate was least utilized component. Thalassemia ward was majorly benefited.

Conclusion: Periodic evaluation of utilization pattern, demand for different blood products also helps to maintain the blood stock.

Keywords: Components, Red Cell Concentrate, Fresh Frozen Plasma, Utilization

Introduction

Blood is a specialized bodily fluid that supplies essential substances and nutrients and removes metabolic waste products from the cells. The cellular components include red blood cells, white blood cells, platelets and cryoprecipitate. Plasma contains coagulation factors. Blood is essential for human survival.^[1-3] Blood component therapy has gained much of the interest in recent years because of its merits over whole blood transfusion like, it reduces volume overload on patient and has greater shelf life, better patient management. Component therapy was introduced between 1950s and 1960s to maximize the benefits of all components present in the whole blood.^[5] In developing countries there are limited resources of blood and increasing demand, and hence it is necessary to make an efficient use of blood. As blood is a scarce resource, clinician should weigh the risks of transfusion against risks of not transfusing. Primary Goal of blood centers and transfusion services is to promote high standards of quality in all aspects of production, patient care, and service. Evaluation of pattern of blood component usage, its demand and good audit management is needed to ensure appropriate utilisation of precious resource.^[11]

Transfusion audits provide a review of policies and practices to ensure safe and appropriate transfusions and are based on measurable, predetermined performance criteria.

Transfusion services should investigate an adequate sampling of cases Audits assess the facility's performance and effectiveness in:

- Blood ordering practices for all categories of blood and components.
- Minimizing wastage of blood components
- Distribution, handling, use, and administration of blood components.
- Evaluating all confirmed transfusion reactions.
- Meeting patients' transfusion needs.
- Informing patients and physicians in a timely and confidential manner of possible infectious disease transmission^[13]

Materials and Methods

Present study was a retrospective study carried out in our Blood Bank, at P.D.U. Hospital Rajkot over a period of 1 year from January 2017 to December 2017. We collected data of monthly collection and utilisation of blood components from the record books in the blood bank. Details of components issued are documented in the blood bank registers. It included cross matched and issued blood units. Data also included age, gender, diagnoses of transfusion recipients and the department which utilized it like Medicine, Labour Room, Gynaecology, Surgery, Orthopaedics etc.

We also recorded indication of component transfusion to the patient, number of components demanded by the clinicians, number of transfusion episodes for all patients and branch/specialty of medicine by which the components were demanded from blood requisition forms. The usage of different types of components was recorded and correlated with the patient's diagnosis and indications for transfusion.

Result

The total number of units issued in the year 2017 was 22290 out of which RCC was 17468 followed by FFP 3706 and Platelet Concentrate 961. Cryoprecipitate was the least utilized component only 155 units in entire year. Thalassemia and medicine ward were majorly benefitted with red cell concentrate. As shown in Figure 1 the demand of components is more in female as compared to

male. Maximum number of components issued were of B positive. The requirement of components was majorly observed in the age group of 13 to 30 years. Least number of component requirement was seen in ENT department. The most common indication of transfusion in labour room was Post-Partum Haemorrhage and Abruptio placenta followed by blood loss in procedure. In SURGERY and ORTHOPEDICS, the most common indication of utilization of component was polytrauma leading to blood loss and hypovolemia. In MEDICINE maximum RCC were utilized for Thalassemia patients and FFP were utilized for patient with liver disorders and coagulopathies. Paediatric patients were having sepsis and anaemia as the main indication for transfusion of the blood components. Acaemia continues to be the most common indication of transfusion.

Table 1: Showing Number of Units of Different Components.

COMPONENT	NUMBER OF UNITS	Percentage
Red Cell Concentrate	17468	78.36%
Fresh Frozen Plasma	3706	16.62%
Platelet Concentrate	961	4.31%
Cryoprecipitate	155	0.71%
Total	22290	100%

Table 2: Depicting The Group Wise Utilization of Different Components.

GROUP	NUMBER OF UNITS	PERCENTAGE
A Positive	6250	27.92%
B Positive	6963	30.84%
O Positive	6181	27.01%
AB Positive	1676	7.44%
A Negative	344	1.5%
B Negative	597	2.65%
O Negative	564	2.50%
AB Negative	155	0.68%
TOTAL	22290	100%

Table 3: Comparative Study of Blood Components at Different Centres.

	Present Study (2017)	KIMS,Hubli ^[4] (2015)	SAQR hospital,UAE(2011) ^[9-10]
Total number of units issued	22290	12555	7045
% of red cell concentrates	78.36%	43.77%	49.25%
% of fresh frozen plasma	16.66%	36.69%	25.55%
% of Platelets	4.3%	19.52%	18.45%
% of cryoprecipitate	0.69%	0%	8.16%
% of Female recipients	53.33%	61.81%	52%
% of male recipients	46.67%	38.19%	48%

Table 4: Comparative Study of Components by Different Departments at Different Centres.

Diagnoses	Present Study	KIMS,Hubli ^[4]	SAQR hospital,UAE ^[9-10]
Surgery	10.12%	16.07%	33%
Labour room	13.27%	13.94	7%
Gynecology	4.78%	20.50%	4%
Orthopedics	8.65%	18.97%	27%
Peadiatrics	11.55%	11.48%	12%
Medicine	50.93%	18.32%	16%
ENT	0.66%	0.74%	1%

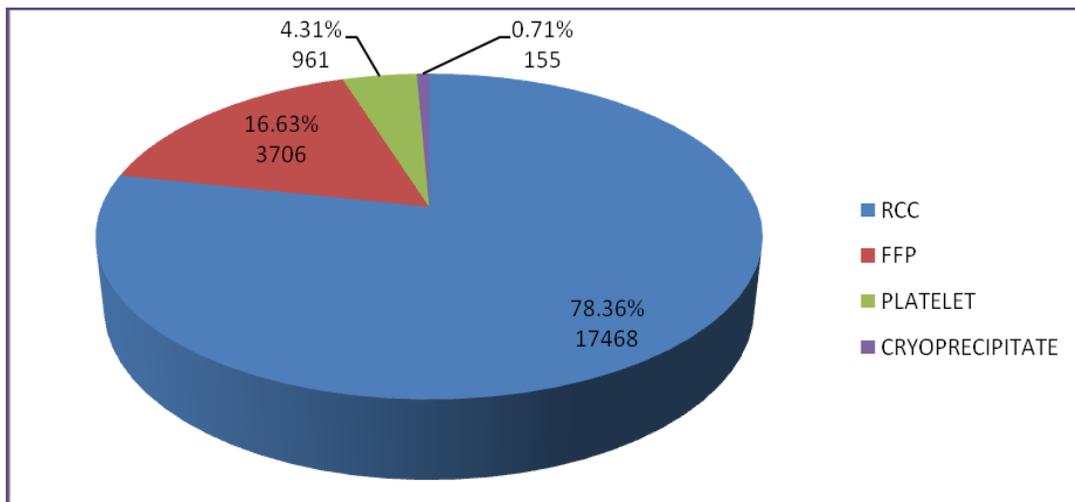


Fig. 1: Depicting The Distribution of Utilization of Various Blood Components.

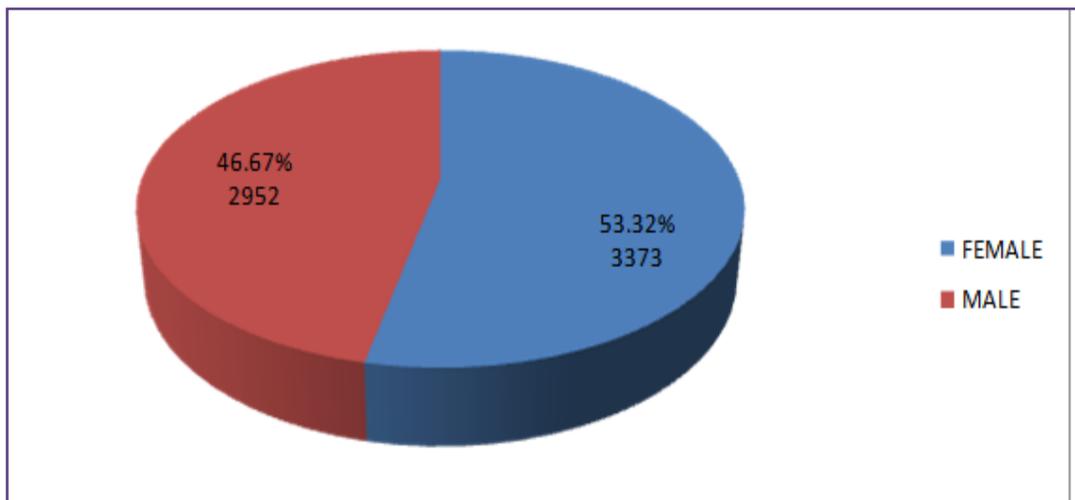


Fig. 2: Gender Wise Distribution of Transfusion Recipients.

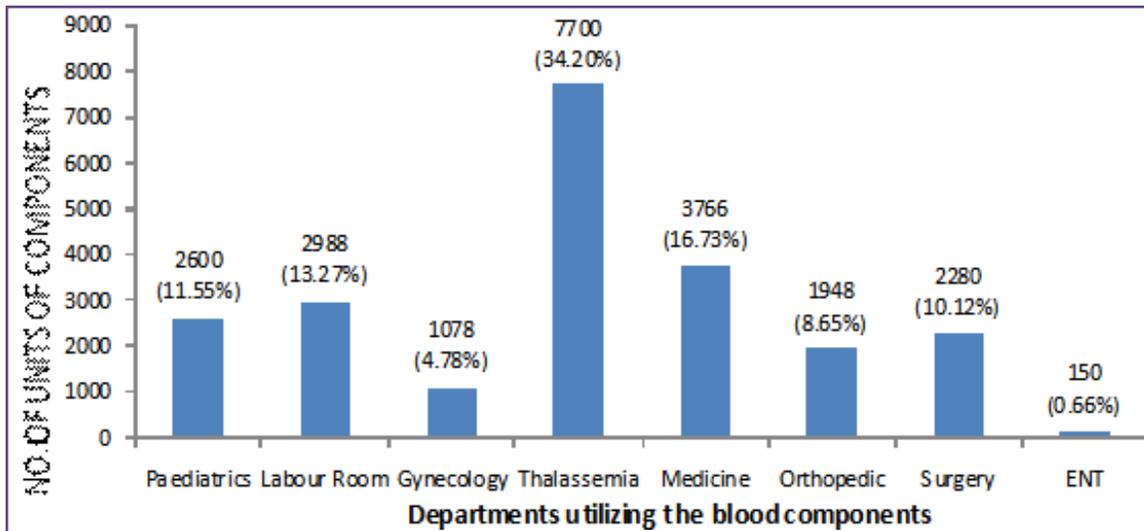


Fig. 3: Showing Utilization of The Blood Components by Different Departments.

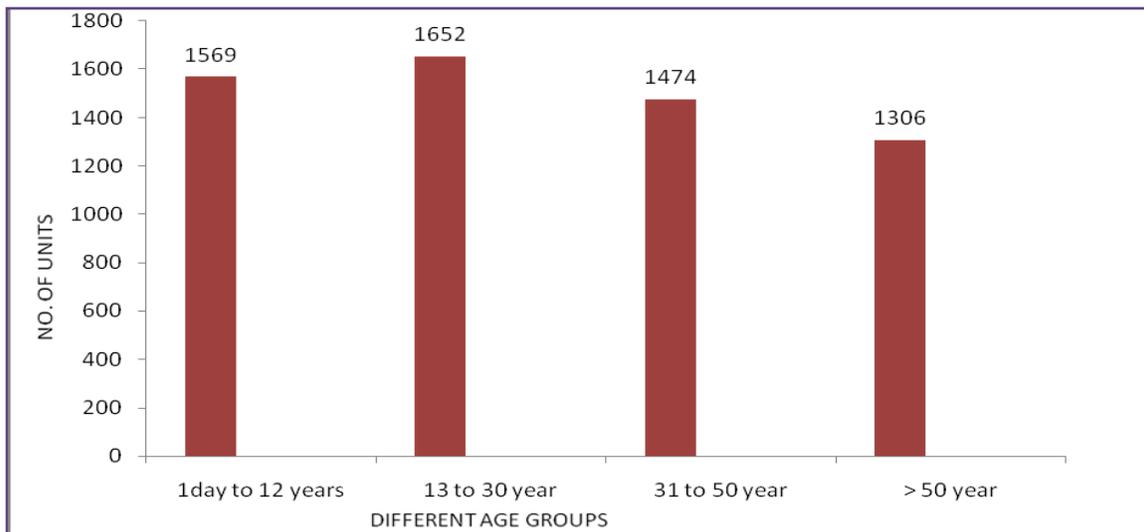


Fig. 4: Column Graph Showing No. of Blood Components Issued in Different Age Groups.

Discussion

Blood transfusion services are vital and integral part of modern health care. In recent years the blood components utilization has been increasing due to burden of chronic diseases in aging population, blood intensive surgical procedures^[2]. Effective use of blood components is important goal for blood utilization management system. Many of the recipients were given single unit transfusion. This requires proper knowledge regarding availability of the components among the clinicians.^[5] There is considerable variation in the pattern of utilization of the components among various clinical specialties and hospitals. Request were less than the number of units issued because there were many patients given more than one unit of blood.

There is a variation in utilization of the components in depending on anticipated blood loss or actual blood loss. As the actual loss might be less than the anticipated blood loss leading to excessive transfusion. The total number of components issued were 22290 of which RCC were 78.36% (17468), FFP were 16.62% (3706), platelets were 4.31% (961) and cryoprecipitate were 0.71% (155).

As seen above in figure 2 the number of female 3373(53.32%) recipients are more than males 2952(46.67%). Of all the blood groups B positive was more in demand as per data of Table no.2

As per comparative study the pattern of utilization of components remains the same as above. The number of

female recipients stays on a higher side in all the three studies. RCC also continues to be the most utilized product followed by FFP and Platelet Concentrate.

As per table 4 in present study maximum number of components are issued to department of Medicine where as in study carried at KIMS, Hubli maximum number of components are issued to department of Gynecology^[4] and at SAQR hospital, UAE maximum number of components are issued to department of surgery^[9-10]. There is no uniformity in distribution of blood and its components according to clinical specialties.^[5] There is a variation in the pattern of utilization of the components in different institutes by different departments. In surgical cases blood and components are often ordered due to anticipated loss than actual one. This leads to overuse of blood products, wastage and unnecessary exposure of patients to various haematological antigens and infections. Hence, inappropriate use of blood and blood components should be avoided^[6].

Conclusion

This study provides information of pattern of usage of blood and blood components in our hospital. This also enables internal quality control for better functioning of blood bank. This also shows the importance of formulation and implementation of strict guidelines for transfusion practices in the hospital. This should be agreed upon by the clinicians and blood bank authorities. Thereby unnecessary usage of blood units can be controlled and effective management of blood stock can be achieved.

It is important for the blood bank to be able to fulfil the demands for this life-saving product and at the same time, evaluate and assess the existing trends of blood ordering. This is important to prevent misuse which may lead to shortage of blood availability and thus denial of blood supply to someone in a life-threatening situation

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