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Original Research

A Study on Utilization of Blood and Blood Components at a District Hospital in Northern Rajasthan

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ABSTRACT
Introduction: Blood is a specialized bodily fluid that supplies essential substances and nutrients and removes metabolic waste products from the cells. So blood transfusion services in a hospital are necessary for providing safe and adequate blood and blood components. Evaluation of pattern of blood component usage, its demand and good audit management is needed to ensure appropriate utilization of precious resource. **Objectives**: (1) to find out transfusion practice (Indications) and the utilization pattern of each blood component in various departments of the hospital. **Material and Method**: This was a record review conducted at Blood Bank of Govt. D.B.Hospital, Churu for a period of 8 months from April 2018 to November 2018. We have collected data of issued units of whole blood (WB), packed red blood cells(PRBC), fresh frozen plasma(FFP) and platelets from all departments for study on utilization pattern. 700 randomly selected requisition forms from different clinical departments were reviewed for evaluation of indications of transfusion. **Results**: A total of 6902 transfusions were observed in various departments during study period, out of which 3033 were whole blood transfusion and remaining were component transfusion. Blood components were used 1.27 times more as compared to whole blood. We found that 43.94% whole blood, 41.99% packed RBC, 5.19% RDP and 8.88% FFP were used by various departments. **Conclusion**: Periodic evaluation of utilization pattern, demand for different blood products can helps to maintain the blood stock.

Key Words: Whole Blood, Packed Red Blood Cells, FFP, Blood Requisition Forms

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INTRODUCTION

Blood is specialized bodily fluid that supplies essential substances and nutrients and removes metabolic waste products from the cells. It is composed of cells and plasma. The cellular components include red blood cells, white blood cells and platelets. Plasma contains coagulation factors. There is no effective substitute for blood till now. Hence transfusion of donated blood is the main stay of treatment in variety of medical conditions.[1] Inappropriate transfusion practices can lead to serious consequences for recipients including transmission of infectious agents.[2] In developing countries there are limited resources of blood and demand is increasing, hence it is necessary to make an efficient use of blood.[3] As blood is a scarce resource, clinician should weigh the risks of transfusion against risks of not transfusing blood.[4] 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, has greater shelf life and better patient management.[5] Evaluation of pattern of blood component usage, its demand and good audit management is needed to ensure appropriate utilization of precious resource. Hence, the present study was planned to find out transfusion practice and the utilization pattern of each blood component in the hospital.

MATERIAL AND METHOD

Present study was a record review and conducted at Blood Bank of Govt DB Hospital Churu. This is a district hospital and recently upgraded to a medical college hospital. In the present study, all the requests for various blood components from April 2018 to November 2018 were reviewed. We have collected data for all patients who have been issued stored whole blood, packed red blood cells, fresh frozen plasma and platelets. We included all units cross matched and issued for use. All transfusions included in the study were allogenic. The clinical data and transfusion details were obtained from the request forms, blood bank records and computerized patient information. For each patient the data included hospital number, age, gender, type and numbers of each blood component issued, date of issue of blood components, diagnosis requiring transfusion and other relevant details. For study of indications of transfusion 700 requisition forms were randomly selected through computer generated random numbers and reviewed. We collected the blood request forms randomly for whole blood (300), PRBC (200), PC(100) and FFP(100) and analyzed them for indications for transfusion.

RESULTS

In our study total 6902 transfusions were done in various departments from April 2018 to November 2018, out of which 3033 were whole transfusions and remaining 3869 were blood component transfusions (Table 1). Few blood units were discarded from collected blood due to transfusion transmitted infections like HBsAg, HIV and HCV, VDRL positivity and few units discarded from suboptimal collection of blood because of donor disapproval and expiry of shelf life.

TABLE-1 Distribution of Transfused Blood and Blood Components

S.NO.	Type of Blood Product	Total no. of Transfusions	Percentage
1.	Whole Blood	3033	43.94%
2.	PRBC	2898	41.99%
3.	RDP	358	5.19%
4.	FFP	613	8.88%
	Total	6902	100%

Maximum consumption of blood and blood components were done in Gynae & Obst. Department followed by medicine department (Table 2).

TABLE-2 Department Wise uses of Blood and Blood Components

S.NO.	Department	No. of Transfusions				Total no. of Transfusions	Percentage
		WB	PRBC	RDP	FFP		
1.	Surgery	344	270	60	-	674	9.77
2.	Medicine	1029	1035	100	123	2287	33.13
3.	Gynae & Obst.	1326	1357	-	80	2763	40.03
4.	Paediatrics	80	37	-	-	117	1.69
5.	Oncology	05	50	59	40	154	2.23
6.	Ortho & Trauma	20	79	50	-	149	2.16
7.	Emergency	154	40	89	370	653	9.47
8.	ENT	30	20	-	-	50	0.72

9.	Nehrology	32	01	-	-	33	0.48
10.	Labour room	13	09	-	-	22	0.32
	Total	3033	2898	358	613	6902	100

Table 3 shows that females were transfused more blood and blood components than males.

TABLE-3 Gender wise distribution of Blood and Blood products

	male	**female**	
Total Transfusion	2502	4400	6902
Percentage	36.25	63.75	100

TABLE -4 Indications of Various Blood Components

S.NO.	**Predominant reason for indication**	**WB(300)**	**PRBC(200)**	**PC(100)**	**FFP(100)**
1.	Anemia	80	-	-	-
2.	Non-surgical bleeding	53	37	-	-
3.	Surgical bleeding	104	45	-	-
4.	Exchange Transfusion in neonates	30	-	-	-
5.	Hemodialysis	33	-	-	-
6.	Thalassemia	-	36	-	-
7.	Thrombocytopenia	-	-	100	-
8.	Infection & Septicemia	-	-	-	22
9.	Preg. & Labour	-	82	-	10
10.	DIC and other Coagulopathies	-	-	-	35
11.	Liver disease	-	-	-	25
12.	Other medical conditions	-	-	-	08

Table 4 shows that surgical bleeding was the most common indication of whole blood transfusion. Anemia was the second most common indication of whole blood transfusion. Pregnancy and labour was the most common indication of PRBC transfusion and thrombocytopenia was the most common indication of platelet concentrate transfusion. DIC and other coagulopathies were most common indication of FFP transfusion.

We compared whole blood and blood component therapy in various departments and found that blood components were

1.27 times more used as compared to whole blood (Table 5).

TABLE-5 Comparative of Whole Blood v/s Component Therapy

S.NO.	Name of the Department	Comparison(no. of transfused units)		Modern/Conventional Ratio
		Conventional whole blood therapy	Modern Component therapy(PRBC+RDP+FFP)	
1.	Surgery	344	330	0.96
2.	Medicine	1029	1258	1.22
3.	Gynae & Obst.	1326	1437	1.08
4.	Paediatrics	80	37	0.46
5.	Oncology	05	149	29.8
6.	Ortho & Trauma	20	129	6.45
7.	Emergency	154	499	3.24
8.	ENT	30	20	0.67
9.	Nehrology	32	01	0.03
10.	Labour room	13	9	0.69
	Total	3033	3869	1.27

DISCUSSION

Blood transfusion services are responsible to provide safe and adequate blood transfusion to the patients and become vital and integral part of modern health care. There is considerable variation in the pattern of utilization of blood and it's components between different hospitals and various clinical specialties. In present study, we received 5334 requests and 6902 units were issued after proper cross matching and screening. Requests were lesser than the number of blood units issued, this was because many patient were transfused with more than one unit of blood. In our study females (63.75%) received more blood units than males(36.25%), this is contrary to the studies done by Mathew et al.[1], Bansod et al.[6].They noted males as major recipients receiving transfusions. We noted 3033 units of whole blood utilized among total 6902 blood units. Joshi et al found increased number of whole blood utilization compared to other components [4]which is contrary to our study. Anshoo et al.[7] and Venkatachalapathy and Subhashish [8]documented increased distribution of packed red cells among blood components which is correlating with our findings. Ambroise et al.[9] showed increased issue of FFP and platelets in relation to PRBC, this is contrary to our study. In the present study, majority of blood units were issued to gynae and obst. Venkatachalapathy and Subhashish[8] noted highest utilization of blood units by gynae and obst. department which was similar to the present study. Alcantara et al.[10] found medicine department utilizing maximum number of blood units contrary to our study. There is no uniformity in distribution of blood and its components according to clinical specialities. In elective surgical and cessarian cases blood and components are 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. This also increases workload on blood bank staff, which could be utilized for processing blood for more needy patients. So, inappropriate use of blood and blood components should be avoided. PRBC is most commonly indicated for increasing oxygen carrying capacity in anemic patients. In few studies it was concluded that anemia was most common indication for PRBC transfusion.[1] Contrary to that we found that not even a single unit of PRBC was used in the treatment of anemia. This shows that still all the clinicians are not following the transfusion guidelines. The only indication of platelet transfusion in our study was thrombocytopenia. Although we have not gathered information about the cause of thrombocytopenia in our study

But the study area is Dengue prone and this may be the main cause of thrombocytopenia.

CONCLUSION

We found that blood component usage was more as compared whole blood. We also noted that still clinicians are not following the guidelines of transfusion of blood and

blood products. There is requirement of formulation and implementation of strict guidelines for transfusion practices in the hospital.

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