



THE TREND OF USING BLOOD COMPONENTS AT A TERTIARY CARE CENTRE: A HOSPITAL BASED STUDY

Dr Rupali Chordia Assistant Professor, Dept of Pathology, Dr Rajendra Gode Medical College

Dr Himani Shemar* Associate Professor, Dept of Community Medicine, Dr Rajendra Gode Medical College *Corresponding Author

ABSTRACT **Introduction:** Blood is a scarce and expensive resource. Blood Transfusion therapy is an effective life saving procedure which benefits patients from wide range of clinical conditions. Due to lack of sufficient data on pattern of utilization the present study was planned to study the blood transfusion practices at a tertiary care hospital. **Methodology:** A hospital based observational study was conducted at Tertiary Care Hospital for a period of one and a half years from April 2015 to October 2016. Blood Requisition Forms from the records were used to collect the data. Data entry was done in MS Excel and data Analysis was done using Software SPSS. **Results:** Prevalence of use of Packed cell Volume was 74.9% in our study as compared to whole blood which was 18.1%, platelet rich plasma(2.63%), fresh frozen plasma (4.04%) and platelet concentrate (0.18%). **Conclusion:** It was observed that there is an increasing trend to use blood components instead of whole blood. Pattern of using blood components should be evaluated from time to time and necessary measures should be taken to use blood components according to updated guidelines.

KEYWORDS : Blood Transfusion, Blood Components, Whole blood, Packed cell volume.

INTRODUCTION

Blood Transfusion is considered as an effective lifesaving intervention.¹ Blood Transfusion therapy benefits patients from a wide range of clinical conditions like Trauma, burns, surgical interventions, hemoglobinopathies etc.

Transfusion medicine is a complex process that depends on several professionals. However, it is evident from different regions of the world that there is considerable variation in patterns of clinical blood use between different hospitals, different clinical specialties and even between different clinicians within the same team.²

Blood is a scarce and expensive resource and it is essential to use it judiciously keeping in mind the risks involved. To achieve this, administration of blood components should be encouraged in place of whole blood. Rational administration of blood components is a more effective way of utilization of such a scarce human resource like blood.³

Component therapy was introduced in 1950's-1960 which involves administering only the component needed as per indication. The clinical practice guidelines for the use of blood components aim to: improve the consistency and appropriateness of transfusion practice; promote the integration of quality management systems into transfusion practice; reduce the overall number of transfusion-related complications; increase consumer awareness of the benefits and risks of blood component therapy; and conserve a limited resource.⁴

Advantages of transfusion of blood components includes greater shelf life than whole blood, and also prevents the overload of unnecessary whole blood transfusion.⁵ Since whole blood is allogenic, optimal utilization of blood helps in reducing or eliminating the risk of blood-borne endogenous infections. Appropriate and rational use of blood/blood components is required to ensure their availability to needy patients as well as to avoid the unnecessary risk of transfusion-transmitted diseases.⁶

Limited data is available on the use of blood products, but there are studies which suggest that blood products are often overprescribed in both developed and developing countries.⁷ Studies regarding usage of blood components are less from India as compared to western countries. 8-10 Hence, this study was planned to evaluate the blood transfusion practices in our hospital over a period of one and a half year and analyze the age-wise, gender wise and disease condition- wise utilization pattern of each blood product.

METHODS:

The present study was a hospital based observational study planned at a tertiary care hospital for a duration of one and a half years from April 2015 to October 2016. This hospital is a tertiary care hospital situated in the city with 500 bedded capacity and has all the medical and

surgical specialties. The blood requisition forms from the records of the Blood bank were used to collect data during this duration. Approval was taken from Institutional Ethical Committee for conducting this study. Based on the information given in the blood request form, data on patient's age, sex, clinical diagnosis requiring transfusion, blood component issued and other relevant information was collected.

The following was the exclusion criteria

1. Wherever detailed information regarding blood transfusion cannot be assessed.
2. All cases admitted outside the hospital requesting issue of blood and blood products for transfusion.
3. The following blood products were excluded from the study- leucocyte poor red cell concentrate, granulocyte concentrate, single donor plasma, cryo-poor plasma, albumin, factor VIII conc. factor IX, immunoglobulins.

The data collected was entered in MS Excel and analyzed using IBM SPSS Statistics for Windows (version 20.0).

RESULTS:

A total of 2630 blood requisition forms from the records of blood bank of tertiary care hospital were assessed. The study showed 74.9% (9009) units of Packed cell Volume were issued to patients which was more as compared to other issued blood components such as 18.1% (2180) whole blood units, 2.63% (317) units of platelet rich plasma, 4.04% (486) units of fresh frozen plasma and 0.18%(22) units of platelet concentrate issued. The cryoprecipitates were excluded from the study as the number of units issued was very less. There were 1573 (59.8%) female patients as compared to 1057(40.2%) male patients. Majority of the patients 1133 (43.1%) were in the age group of 21-40 years followed by 657 (24.9%) in the age group of 1-20 years, 508(19.3%) in the age group of 41-60 years, 270 (10.2%) in the age group of 61-80 years, 32 (1.2%) in the age group of 80-100 years and 30 (1.14%) in < 1 year of age. Maximum units of blood components were issued to patients diagnosed with anemia 1513 (57.5%) followed by pre-operative 539 (20.5%), thalassemic patients 312 (11.9%), post-operative 124 (4.7%), sickle cell disease 66(2.5%), thrombocytopenic 43(1.6%), liver disorders 18(0.7%) and the least were DIC patients 15(0.6%) (Table 2).

Table 3 shows that out of the 12,014 units transfused, medicine had maximum number 5409 (45%) of transfusions, followed by surgery 2415 (20.1%), pediatrics 2375 (19.7%), obstetrics and gynaecology 1404 (11.6%), orthopedics 343 (2.8%), Ent 38 (0.3%) and ophthalmology 30 (0.2%). In the present study the highest utilisation of blood products was in the age group of 21-40 years followed by 1-20 years. The age group < 1 year and 81-100 years received the least transfusions (Fig2). Maximum usage of Packed cell volume was in patients of anemia (5706) followed in decreasing order by thalassemia (1286), pre-operative (1226), sickle cell disease (369) and post-operative (260). Whole blood transfusions were more in anemia

(1436), pre-operative (524), post-operative (116), sickle cell disease (48), DIC (35) and thrombocytopenic patients (21).

Fresh frozen plasma was utilised maximally in liver disorders(173) , DIC (172), post-operative (117) and anemia (24). Platelet rich plasma was transfused mainly in thrombocytopenic patients (110) followed by pre-operative (87), DIC (63) and thalessemic patients (57). Platelet concentrates were exclusively transfused to thrombocytopenic patients (22)

DISCUSSION:

Blood transfusion forms an important part of various treatment protocols. Blood must be transfused cautiously in view of its propensity to cause adverse effects such as introduction of donor antigens in the recipient, transfusion reactions or exposure to various transfusion transmitted diseases. The indications for ordering blood must be fully justified to avoid misuse or overuse of this precious resource. The present study showed use of whole blood as 18.1% which is comparable to finding of Ambroise et al (18.7%) but is more than finding reported in Alcantara JC et al12 (11.8%) and Sharma et al13 (6.2%). The packed cell volume was used in 74.9% in present study which is comparable to findings of Ahmed et al (74.5%), Alcantara JC (78.2%), Sharma R et al (81.3%) but more than the finding of Ambroise et al14 (34.5%). The use of platelet concentrate was very less (0.18%) in present study which was more in other studies as Ahmed et al15(14.2%), Ambroise M et al (21.5%), Alcantara JC et al (8.4%), Sharma et al (10.4%). The use of fresh frozen plasma and platelet rich plasma is less in our study. The use of blood components should be encouraged. The maximum patients for transfusion were from medicine department (45.02%) which is corresponding to the findings of Alcantara JC et al (54.2%), Kataria A et al (36.9%), Gaur DS et al 17(58.1%) but more number of patients were reported from Obstetrics and Gynaecology department in studies from Sharma et al (46%), Garg R et al 16(21.6%).

The maximum number of transfusions were reported in patients diagnosed with Anaemia (59.6%) which is comparable to findings of Gaur et al where maximum transfusion was reported in Anaemia patients (41.1%)

CONCLUSION:

It is concluded that there is increasing trend of using blood component instead of whole blood. Regular audits are an effective tool to increase rational use of blood by identifying areas requiring interventions to change transfusion practice. Each hospital must develop its own guidelines both for routine and emergency services on the basis of National policy and implement the same through the hospital transfusion committee to ensure effective blood utilization. Workshops on rational use of blood and its components should be conducted regularly.

Table 1 Age-wise and gender-wise distribution of Patients

Characteristics	Number (n)	Frequency (%)
Gender		
Male	1057	40.20
Female	1573	59.80
	2630	100
Age group (years)		
<1	30	1.15
1-20	657	24.98
21-40	1133	43.08
41-60	508	19.31
61-80	270	10.26
81-100	32	1.22
	2630	100

Table 2: Disease diagnosis wise distribution of patients

CLINICAL DIAGNOSIS	NUMBER OF PATIENTS	PERCENTAGE
ANEMIA	1513	57.5%
DIC	15	0.6%
LIVER DISORDERS	18	0.7%
POST-OPERATIVE	124	4.7%
PRE-OPERATIVE	539	20.5%
SICKLE CELL DISEASE	66	2.5%
THALESSEMIA	312	11.9%
THROMBOCYTOPENIA	43	1.6%
TOTAL	2630	100%

Table3: Distribution of blood components according to the department

DEPT	WB	PCV	PLC	PRP	FFP	TOTAL
MEDICINE	1199	3829	12	46	323	5409 (45%)
SURGERY	403	1785	0	133	94	2415 (20.1%)
OBSTETRICS AND GYNAECOLOGY	354	900	0	81	69	1404 (11.6%)
PEDIATRICS	107	2201	10	57	0	2375 (19.7%)
ORTHOPAEDICS	117	226	0	0	0	343 (2.8%)
ENT	0	38	0	0	0	38 (0.3%)
OPHTHALMOLOGY	0	30	0	0	0	30 (0.2%)
TOTAL	2180	9009	22	317	486	12,014

Table: 4 Distribution of blood components according to disease condition

CLINICAL DIAGNOSIS	WB	PCV	PLC	PRP	FFP	TOTAL
ANEMIA	1436	5706	0	0	24	7166 (59.6%)
DIC	35	49	0	63	172	319 (2.6%)
LIVER DISORDERS	0	11	0	0	173	184 (1.5%)
POST-OPERATIVE	116	260	0	0	117	493 (4.1%)
PRE-OPERATIVE	524	1226	0	87	0	1837 (15.2%)
SICKLE CELL DISEASE	48	369	0	0	0	417 (3.4%)
THALESSEMIA	0	1286	0	57	0	1343 (11.1%)
THROMBOCYTO PENIA	21	102	22	110	0	255 (2.1%)
TOTAL	2180	9009	22	317	486	12,014

Transfused Components with Gender

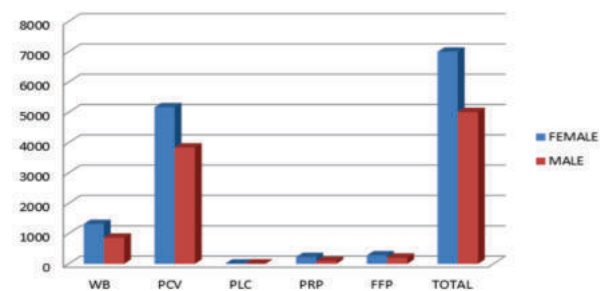


Fig1. Gender wise distribution of transfused blood components

Age Groups and Transfused Components

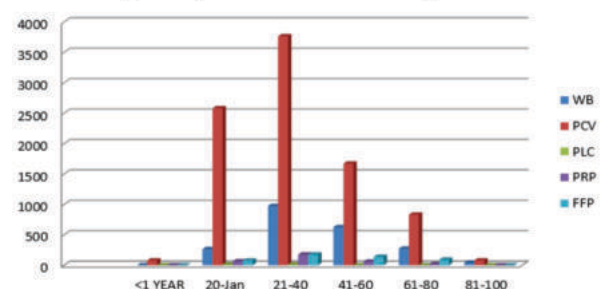


Fig 2. Age wise distribution of transfused blood components

REFERENCES:

- Joshi A, Ajmera R, Kulkarni A, Bindu R, Kulkarni S. Observational study in utilization of Blood And Blood Products at Tertiary Care Centre.IJHSR
- Chlsakuta A, Lackritz E, Mcclelland B, Page R, Zetterstrom H. The clinical use of blood in medicine, obstetrics, paediatrics, surgery & anaesthesia, trauma & burns. World health Organization. Blood transfusion safety. [online]. 2002; available from: <http://whqlibdoc.who.int/hq/2001/a72894.pdf>
- History of blood banks and history of blood banking worldwide. [Online]Available from: <http://www.bloodbook.com/banki ng.html>
- The NHMRC/Australasian Society of Blood Transfusion (ASBT) Clinical Practice Guidelines on the Use of Blood Components (2001)
- B.G Solheim, F Wesenbe. Rationale Use Of Blood Journal of Cancer, Volume 37, Issue 18, December 2001, Pages 2421-2425.
- Rationale use of blood product , European Journal of Cancer ,2001; 37(18) : 2421-2425.
- World Health Organization, Blood Transfusion Safety, Safe and rational clinical use of blood, URL:http://www.emro.who.int/programmear eas_bloodsafety.htm
- Zimmermann R, Büscher M, Linhardt C, Handtrack D, Zingsem J, Weisbach V, et al. A survey of blood component use in a German university hospital. Transfusion 1997;37:1075-83.

9. Wells AW, Mounter PJ, Chapman CE, Stainsby D, Wallis JP. Where does blood go? Prospective observational study of red cell transfusion in north England. *BMJ* 2002;325:803.
10. Tinegate H, Cha ree S, Iqbal A, Plews D, Whitehead J, Wallis JP, et al. Ten-year pattern of red blood cell use in the North of England. *Transfusion* 2013;53:483-9.
11. The Clinical Use of Blood - World Health Organization Report 2002. Available from: www.who.int/bloodsafety/clinical_use/en/Handbook_EN.pdf
12. Alcantara JC, Opina AP, Alcantara RA. Appropriateness of Use of Blood Products in Tertiary Hospitals. *International Blood Research and Reviews* 2015;3(2):54-65.
13. Sharma R, Jain C. An Audit of Appropriate use of blood components in a tertiary care hospital. *International Journal of Medical Science and Education* 2015;2(3):96.
14. Ambrose M, Ravichandran K, et al. A study of blood utilization in a tertiary care hospital in South India. *Journal of Natural Science, Biology and Medicine* 2015;6(1):106-9.
15. Ahmed M, Save S. Blood Component Therapy in Pediatric Intensive Care Unit in Tertiary Care Center: An Audit. *International Journal of Contemporary Medical Research* 2016;3(5):1506-10.
16. Garg R, Aggarwal R, Falleiro JJJ, et al. AN AUDIT OF THE BLOOD AND COMPONENT TRANSFUSION REQUESTS AND UTILIZATION PATTERN IN A TERTIARY CARE HOSPITAL-CURRENT TRENDS 2013;1(3):82-85.
17. Gaur DS et al, Negi G, Chauhan N, Kusum A, Khan S, Pathak VP. Utilization of blood and components in a tertiary care hospital. *Indian J Hematol Blood Transfus* 25, 91-95 (2009). <https://doi.org/10.1007/s12288-009-0027-1>