



AN AUDIT OF BLOOD TRANSFUSION REQUIREMENT IN A TERTIARY CARE PEDIATRIC HOSPITAL IN NORTH WESTERN INDIA

Immunohaematology

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ABSTRACT

Blood is the most precious gift for human life which can only be available from live human beings. In managing health care services blood transfusion services play a vital role. There is no substitute for blood and its components till date; therefore blood donation drive is very crucial. This retrospective study for 6 months on pattern of utilization of blood components was carried out in the pediatric hospital blood Centre under the department of Immunohematology and transfusion medicine. During the study period, there were total 7988 units transfused, with a monthly average of 1330 units carried out during the period of 6 months for use in patients admitted to our hospital. Periodic review and audit of blood component usage becomes essential to assess the blood utilization pattern in any hospital.

KEYWORDS

Blood, Component, Utilization, Audit

INTRODUCTION

Various medical and surgical procedures require blood transfusion as an important part of treatment.¹ Regular review and evaluation of rationale use of blood and its component is essential to maintain a good inventory.² In children, severe anemia can result in significant morbidity and mortality therefore urgent blood transfusion is a lifesaving intervention.³ In low and middle Income countries, blood shortages are common and any delay in the acquisition and administration of blood can lead to in-hospital mortality of children with severe anemia.⁴

On this basis, it becomes essential to ensure judicious utilization of this scarce commodity especially in a pediatric hospital. Data on blood utilization is helpful in resource limited settings in which there are always competing needs for scarce resources.⁵ Pattern of blood components utilization use and wards requiring blood transfusion helps in evaluation of blood requirement for a particular hospital.⁶ This study was done to assess the present and future demands for blood so that unnecessary requests and transfusions can be avoided and various strategies can be adopted to increase the blood donation.

MATERIAL AND METHODS

Study setting

This study was conducted in the blood centre unit in the pediatric hospital of department of immunohaematology and transfusion medicine of a tertiary care hospital in north western India.

Study design

This study employed retrospective analysis of blood transfusion donations and recipients' data covering all blood and blood components transfused within the period from November 2020 to April 2021.

Data collection

Data were collected retrospectively from the registers of the blood bank for the 6 months period from November 2020 to April 2021 and covered all blood and blood components recorded in the blood bank during this period. Cross-match and issue registers were accessed to retrieve the required information.

STATISTICAL ANALYSIS

The data collected were analyzed using SPSS version 20 software (Armonk, NY. IBM Corp.). Frequency and percentages were used to summarize categorical demographic and clinical variables.

RESULTS

During the study period, there were total 7988 units transfused, with a monthly average of 1330 units carried out during the period of 6 months.

Figure 1 shows Month wise distribution of blood donation and total blood supply during the study period. There is random variation but increase in supply during months of March and April is attributed to thalassemia patients who were previously supplied from the main blood bank of department of IHTM.

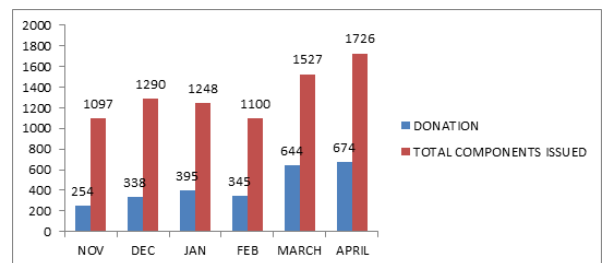


Figure 1 – Month wise distribution of blood donation and total blood supply

Fig 2 shows various distribution of blood components supplied during the study period. PRBCs was the most common supplied followed by fresh frozen plasma followed by random donor platelets and then whole blood.

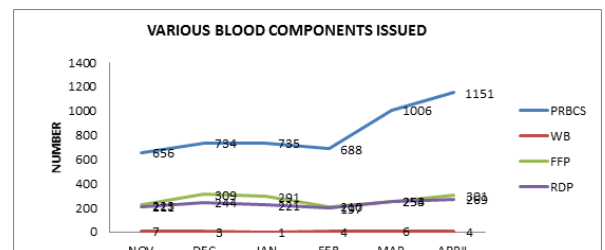


Figure 2 – Month wise distribution of various Blood Components issued in a pediatric hospital

Table 1 shows blood group wise distribution of various components supplied in different wards. B+ve was the most common blood group required followed by O+ve followed by A+ve and then AB+ve.

Table 1 Blood group wise distribution of blood supplied in various wards in a pediatric hospital

BLOOD GROUP	NOV	DEC	JAN	FEB	MARCH	APRIL
A+VE	213	289	283	226	368	468
A NEG	18	23	29	15	38	11
B+VE	422	418	379	426	462	552
B NEG	20	21	25	24	35	17
O +VE	292	421	372	302	459	519
O NEG	21	14	20	26	36	33
AB+VE	108	98	127	76	115	118
AB NEG	3	6	13	5	9	8

Table 2. Age wise distribution of blood supplied in various wards in a pediatric hospital

	<1 YEAR	> 1 YEAR
NOV	536	561
DEC	763	527
JAN	647	601
FEB	495	605
MAR	591	930
APRIL	643	1083

As per table no. 2 children >1 year of age required more blood units than children of age <1 year.

As per table no.3 medical ward is the most common ward with maximum supply followed by surgical ward and the Neonatal ICU.

Table 3. Ward wise distribution of blood supply in a pediatric hospital

	NOV	DEC	JAN	FEB	MAR	APR
MW	407	351	302	408	589	552
SW	300	418	483	285	424	399
ONCO	14	23	19	20	24	61
MICU	55	66	59	35	73	76
NICU	199	214	148	71	130	177
PICU	79	79	96	120	123	97
SICU	4	26	10	19	13	30
SNNR	19	102	122	131	42	43
COVID	20	11	9	11	3	0
THAL	0	0	0	0	100	291

DISCUSSION

This study provides information on the pattern of blood and blood components utilization and demographic characteristics of blood transfusion recipients in a pediatric hospital of a tertiary care hospital.

The total number of whole blood and its component issued from blood centre in 6 months was 7988 units, with a monthly average of 1330 units. 25 units of Whole Blood, 4980 PRBCs, 1587 FFP and 1396 RDP were issued for use in patients admitted to our hospital. Similar findings were seen by Qureshi et al.⁷

Whole blood was mainly used for Double Volume Exchange transfusion in newborn with Hemolytic disease of Newborn. Whole blood is prepared by reconstituting PRBCs with fresh frozen plasma and calculating the required blood volume by weight.

Figure 1 shows Month wise distribution of blood donation and total blood supply during the study period. There is random variation but increase in PRBCs supply during months of March and April is attributed to thalassemia patients who were previously supplied from the main blood centre of department of IHTM. There is random variation in FFP and RDP and no specific peak is seen during any month.

Figure 2 shows various distribution of blood components supplied during the study period. PRBCs was the most common supplied followed by fresh frozen plasma followed by random donor platelets and then whole blood.

Most Common indication for PRBCs transfusion was Anemia due to blood disorders and digestive disorders followed by bleeding. FFP was mainly used in bleeding patients especially in surgical wards where during and after surgery risk of bleeding is present. RDP was mainly

used in patients with thrombocytopenia in infectious and parasitic diseases followed by oncology patients.

Table 1 shows blood group wise distribution of various components supplied in different wards. B+ve was the most common blood group required followed by O+ve followed by A+ve and then AB+ve. This distribution is similar to the overall distribution of blood group in this area. This data helps to manage the blood bank inventory and arrange for blood group specific blood donors for specific patients. Similar results were seen in study by Handa et al.⁸

As per table no. 2 children >1 year of age required more blood units than children of age <1 year. Average units required in children was 613 in age <1 year and in age >1 year required average of 718 units per month. Most children in age <1 year, children in Neonatal ICU had the maximum demand for blood component.

As per table no.3 medical ward was the ward with maximum blood component supply followed by surgical ward and the Neonatal ICU. Patients with anemia are mainly admitted in medical wards. In surgical wards, mainly preoperative anemia correction followed by any surgical bleed included the most common indication. The results were similar to study by Agarwal et al.⁹

CONCLUSION

This study provided information on the pattern of blood and blood components utilization in a pediatric hospital. This also depicts the total requirement of blood components and areas that need to be strengthened within the system for pediatric blood transfusions in this large referral hospital in northwest India. Recommendations can be made that can help improve the efficacy and safety of blood transfusions for children in hospitals. This will ultimately improve the survival of very sick children who present to hospitals and require this lifesaving intervention.

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