Section: Transfusion Medicine

Original Research Article

A STUDY OF UTILISATION OF BLOOD AND COMPONENTS IN A TERTIARY CARE HOSPITAL IN SOUTH INDIA

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ABSTRACT

Background: Blood and its components play a major role in patient care. Transfusion of donated blood is the mainstay of treatment in a variety of medical/clinical conditions. Indiscriminate Use of blood components is on a rise due to easy availability of sophisticated blood banking services. **Aim and Objectives:** To study pattern of utilisation of blood and blood components in a tertiary care teaching hospital in south India.

Materials and Methods: This retrospective study for 12 months (January 2023-December 2023) on pattern of utilization of blood and blood components was carried out in the department of Transfusion Medicine, Anam Chenna Subba Reddy (ACSR) Government Hospital and Medical College, Nellore, Andhra Pradesh, India.

Results: Total blood units collections were 2240. Blood Units utilized were 1989. Packed Red Blood Cells was the most utilized product followed by Whole Blood. FFP was the least utilized product. Supply of blood was maximum to the obstetrics and Gynaecology wards.

Conclusion: Periodic review of blood component usage is very important to access the blood utilization pattern in any hospital. It is relevant for quality management of transfusion practice, cost analyses, and planning local and regional blood donation camps. It helps in inventory management by reducing the overutilization of Blood units and thus can be available for essential needs.

Keywords: Blood and Blood units, utilisation, Packed Red Blood Cells.

INTRODUCTION

Blood is an amazing fluid. Blood is the most precious and unique gift that one human being can give to another human being. A Blood donor donates product known as Whole Blood from which Blood components such as Packed Red Blood Cells, Platelets and Plasma are prepared from a single Whole blood donation. Blood component therapy has gained much interest, due to many advantages over whole blood transfusion in terms of greater shelf life of some blood components, less chance of volume overload in patients and better patient management.[1] Inappropriate transfusion practices can need to serious consequences for recipients. Blood and its components have the propensity to cause side effects such as introduction of donor antigens in the recipient, transfusion reactions or exposure to various transfusion transmissible diseases. Hence, it is very important for clinicians to be aware of these potential risks to the recipient of blood and its products. So, evaluation of pattern of blood component usage, its demand and good audit management is needed to ensure appropriate utilization of precious resource.

Objectives: To study the utilization of blood and blood components in Anam Chenna Subba Reddy (ACSR) Government Hospital and Medical College, Nellore, Andhra Pradesh, India.

MATERIALS AND METHODS

A Retrospective study was done estimate the appropriate use of blood and blood products transfusions in blood bank, Anam Chenna Subba Reddy (ACSR) Government Hospital and Medical College, Nellore, Andhra Pradesh, India. Duration of

our study was one year in total from January 2023 to December 2023. We collected data of monthly collection and utilization of blood and blood components from the record books in the blood bank. It included cross matched and issued blood units. We also studied utilization of blood and its products by department of surgery, orthopaedics, ENT and gynaecological specialities and non-surgical specialities like medicine, nephrology and neurology. Data also included gender, blood group and diagnoses of transfusion recipients, blood or blood components to be used. The results obtained were tabulated and pattern of utilisation was noted.

Inclusion Criteria

- All the transfusions of blood or blood components during the study period in our hospital.

Exclusion Criteria

- Units issued outside hospitals other than our hospital for transfusion.

RESULTS

In this study over a period of one year 2240 units of blood were collected which included 721 units (32.2%) of whole blood,1110 (49.6%) of Packed Red Blood Cells,409 (18.2%) of Fresh Frozen Plasma (FFP). [Table 1] Among collected units ,1989 units were utilised (Table 2) and 251 units were discarded due to Transfusion Transmitted infections and sub optimal collection of blood due to donor disapproval and expiry of shelf life. Packed Red Blood Cells (48.7%) was the maximum utilised product followed by whole blood (40.6%) and then FFP (10.7%). [Table 2]

The utilisation of whole blood and components was higher in females (80.1%) followed by males (19.9%). [Table 3] Among the positive blood groups, O Positive ve was the most frequently utilized blood group, contributed 823 (41.38%) of the total 1989 units followed by B Positive blood group utilized 658 (33.09%) units, A Positive ve 347 (17.45%) and AB Positive units utilized were 86 (4.32%) of the total blood Components. Among the negative blood groups, O negative was the frequent most utilized blood group, forming 40 (2.01%) followed by B Negative which is contributing 20 (1%) of the units transfused. Blood groups A Negative and AB Negative were the least utilized blood groups contributing only 12 (0.6%) and 3 (0.15%) units transfusion respectively. [Table 4]

The pattern of utilisation of blood and blood components according to the specialized departments was also analysed (Table 5). Blood units were utilized mainly by Obstetrics and Gynaecology wards, which accounted for 1238 units (62.24%), followed by the department of General Medicine which received 240 (12.06%) units. Demand from the surgical wards was 110 (5.53%) units which were provided. Utilisation by department of orthopaedics were 138 units (6.94%). In our hospital, less requirement for blood units (0.85 %, n=17) was from the department of ENT, Oncology and Pulmonology during the study period. [Table 5]

The most common diagnosis for patients requiring blood products was peri partum (n=994/1989, 50%) followed by hepatic and renal disorders (n=278/1989, 14.1%) and trauma (239/1989, 12%). [Table 6]

Table 1: Total Collection of blood and blood components in 1 year (2023 January -2023 December)

Blood and Blood components	Number (n)	Percentage (%)
Whole blood	721	32.2%
Packed red cells	1110	49.6%
Fresh frozen plasma	409	18.2%
Platelets	-	-
Total	2240	100%

Table 2: Utilisation of blood and blood components in 1 year (2023 January -2023 December)

Blood and Blood components	Number (n)	Percentage (%)
Whole blood	809	40.6%
Packed red cells	968	48.7%
Fresh frozen plasma	212	10.7%
Platelets	-	-
Total	1989	100%

Table 3: Gender wise distribution of utilisation of blood and blood components

Gender	No. of Blood and Blood components utilised	Percentage (%)
Male	397	19.9%
Female	1592	80.1%
Total	1989	100%

Table 4: Blood Group wise utilisation of blood and blood components

S. No	Blood Group	Number (n)	Percentage (%)
1	A+VE	347	17.45 %
2	B+VE	658	33.09 %
3	O+VE	823	41.38 %
4	AB+VE	86	4.32 %

5	A-VE	12	0.60 %
6	B-VE	20	1.00 %
7	O-VE	40	2.01 %
8	AB-VE	3	0.15 %
	Total	1989	100 %

Table 5: Utilisation of blood and its components by various departments

Department	Whole blood Unit	Packed red cells Unit	Fresh frozen plasma Unit	Total	Percentage (%)
General Medicine	100	120	20	240	12.06 %
General Surgery	40	50	20	110	5.53 %
Orthopedics	78	60	-	138	6.94 %
Obstetrics & Gynaecology	507	594	137	1238	62.24 %
Paediatrics	15	45	13	73	3.68 %
Medical Intensive Care Unit(MICU)	48	50	12	110	5.53 %
Surgical Intensive Care Unit(SICU)	10	21	10	41	2.06 %
Dialysis	2	20	-	22	1.11 %
Other(ENT/Oncology/Pulmonary)	9	8	-	17	0.85 %
Total	809	968	212	1989	100 %

Table 6: Diagnosis of Patients requiring Transfusion

Diagnosis	Number	Percentage %
LR/Child birth	994	50
Gynecological disorder's	199	10
Malignancy	60	3
Surgery	159	8
Orthopedics	239	12
Hepatic & Renal disorders	278	14
Bleeding	40	2
Infection	20	1

DISCUSSION

Blood and its blood components play a major role in patient care It is important for the blood bank to be able to ful fill 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. The importance of an internal audit and education programs, emphasizing proper selection of blood components for patients and avoiding their overuse, has been highlighted by various authors who reported a marked decline in inappropriate demands for blood products after such audits were followed by educational sessions for clinicians.[2,3,4,5,6,7]

In this study over a period on one year 2240 units were collected. In the present study it was found that the majority of the blood component transfused was packed red blood cells (48.7%) followed by whole blood (40.6%). The least number of transfused blood components was Fresh frozen Plasma (FFP) (10.7%) (Table 2). Anshoo et al,[8] and Venkatachalapathy and Subhashish,[9] documented increased distribution of packed red blood

cells among blood components which is correlating with our findings. In studies conducted by Joshi AR et al., Gaur D et al., and Giriyan SS et al., showed that the majority of the blood transfused was WB which was contrary to the present study.[10,11,12]

In our study females (80.1%) received more blood transfusion units than males (19.9%) (Table 3). This is contrary to the study done by Ambroise et al,[13] as the noted males as major recipients receiving transfusion. As majority of blood and blood components are utilised by Obstetrics and Gynaecology departments in our hospital, the utilisation of blood and blood components was higher in females.

The most commonly used blood group was O positive (41.38%) which is followed by B Positive and third highest being A Positive blood group (Table 4). Similar finding noted by Agarwal P et al with O Positive use being 34.43%,[14] and Venkatachalapathy et al (40.54%). (Ref 9) 'O' Positive being predominant group for blood transfusion. This corresponds to percentage of blood group distribution in India.[9]

In the present study majority of the blood units were utilised by the Obstetrics and Gynaecology department (62.24%)(Table 5).SS Giriyan,[12] and Venkatachalapathy et al,[9] noted highest utilisation of blood units by Gynaecology department which is similar to the present study. The main reason for the highest utilisation in the Obstetrics and Gynaecology department is due to poor socioeconomic status and ignorance of majority of our population where lack of antenatal supplementation and improper nutrition leads to low haemoglobin prenatally and is the major cause of blood components transfusions in the concerned units of the hospital.

In the present study utilisation of blood units is more in medical wards (12.06%) compared to surgical wards (5.53%). Results of our study are complementary to the study done by Gaur DS, Negi G, et.al, which concluded that the supply of blood components to medical units was high as compared

to surgical unit.[11] Another study conducted by Tinegate, Chattree, et.al., also concluded that the supply to medical units was higher as compared to surgical units.[15] In the study found that the surgical unit was on 4th number in the blood components transfusion order contributing to 5.53% of the total transfusions completed. In cases requiring surgery, blood and components are often ordered due to anticipated rather than actual blood loss.[7] This anticipatory demand increases workload on the blood bank staff, encroaching upon their time, which could be utilized for processing blood for more needy patients. Following a policy of maximum surgical blood order schedule (MSBOS), where the anticipated number of units are only grouped and typed, instead of performing complete crossmatch with various donor units, should be encouraged in the blood banks.[16]

The most common diagnosis for patient requiring condition of blood product was peripartum condition.

CONCLUSION

This study provides information about the utilisation pattern of blood and blood components in our tertiary care hospital. Periodic review of blood component usage is very important to access the blood utilization pattern in any hospital. It is relevant for quality management of transfusion practice, cost analyses, and planning local and regional blood donation camps. It helps in inventory management by reducing the overutilization of Blood units and thus can be available for essential needs.

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