UTILIZATION OF BLOOD AND ITS COMPONENTS AT A TERTIARY CARE HOSPITAL IN PAKISTAN

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ABSTRACT

Background: Audit of blood utilization helps in effective management of blood stock to meet present and future demands.

Objective: To determine utilization of blood and its components in a Tertiary care hospital.

Material and Methods: A retrospective audit was carried out in Blood Bank at a Tertiary Care Hospital of Pakistan from January 2017 to December 2017. Included all consecutive patients who were admitted and received blood components transfusion in inpatient, emergency and ICU departments. All transfusions included in this study were allogenic. Children registered in thalassemia center receiving transfusions were excluded from the study. The frequency of whole blood, packed red blood cells ,fresh frozen plasma and platelet utilization was calculated.

Results: In our study a total of 28963 blood and its components were utilized for inpatients at tertiary care hospital. Whole blood transfusion (41%) were maximum done followed by Packed red blood cells (25%). Male patients (57.5%) had received maximum transfusions as compared to females (42.4%).Most blood transfusions were seen in the age group of 20-50 years. The clinical specialty which required high rate of utilization of blood and its components was Medicine (23.3%). Maximum RBC transfusions were prescribed by Gynaecology and Obstetrics (23.8%) while highest Platelets and FFPs transfusions were seen by Medicine (43.1%) and Gynaecology & Obstetrics (23.1%) respectively.

Conclusion: The high rate of utilization of blood and its components in our study reinforces the importance of justified use of blood and its components in the clinical practice by implementation of guidelines of use of various blood products to meet demands keeping in view shortage of valuable blood components.

Key Words: Utilization, Blood, Components.

INTRODUCTION

Blood banking is a rapidly progressing branch of medical science which has pivotal importance in vouching the safe supply of blood. It needs to be monitored and audited periodically to see trends of utilization of blood components.[1] Evidence based transfusion guidelines recommend that specific blood components are used to correct specific deficiencies.[2]

Blood components prepared are a precious therapeutic modality. It is used in a broad range of hospital procedures like accidents, emergency obstetric services and other surgeries.[3] According to current estimates about 1.2-1.5 million of units are being transfused in Pakistan.[4] Pakistan is experiencing annual shortage of 40% of its blood needs.[5] It was found that appropriate transfusion were fulfilled by 54% in the public and 69% in the private hospitals of Pakistan.[6]

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In current medical and surgical practice a blood transfusion serves as a vital life saving procedure.[7] Balancing supply and demand is particularly challenging when products are perishable. Overstocking blood products is wasteful due to shortage storage duration and reduces availability for patients in our hospital who depend on a common blood supply. However it as great problem to have limited supply of blood products for life saving therapy.[1] Rational use of blood implies that the right blood product is to be given to the patient when needed and in the right amount.[6]

Despite being a common and widespread practice, use of blood and its components is associated with increased risk of transfusion transmitted infections and other side effects. The side effects range from allergic reactions, anaphylaxis, transfusion related acute lung injury, alloimmunization, renal dysfunction and mortality.[8]

However there was no previous audit of utilization of blood and its components in our province of Pakistan, therefore we decide to conduct a retrospective audit of blood and its components in various departments of the hospital and then to develop strategies that will result in optimal therapeutic utilization of blood and its components with maximum clinical benefits to the patient.

Objective

To determine utilization of blood and its components in a Tertiary care hospital

MATERIALS AND METHODS

Study design

Observational (retrospective study) conducted in Blood Bank Department of a tertiary care hospital in Pakistan over a period of 1 year from 1st January 2017 to 30 Deccember 2017.

Study population

Included all consecutive patients who were admitted and received blood components transfusion in inpatient, emergency and ICU departments. All transfusion included in this study were allogenic. Children registered in thalassemia center receiving transfusions were excluded from the study. The frequency of whole blood, packed red cells, fresh frozen plasma and platelet utilization was calculated.

Data collection

The requisition forms for blood and its components and blood bank issue registers were analyzed to obtain information about the total number of various blood components issued including patient details full name, age, gender, department of admission, unique hospital identification number, bed number, indication and total number of units issued. Data was analyzed using software SPSS version 20. Frequencies and percentages were calculated for categorical variables like gender, age groups, units of blood and its components issued.

RESULTS

During the study period 28963 total number of blood and its components were issued for use to inpatients admitted at our hospital. Figure 1 shows that whole blood (41%) was most frequently used followed by Packed red blood cells (25%) and then Platelets (23%) and FFPs (11%). Figure 2 shows most of the blood transfusions during the study period were common in males (57.5%) than in females (42.4). Figure 3 shows most of the blood transfusions were in the age group of 18-50 years. Figure 4 shows maximum transfusions were performed by speciality of Medicine (23.2%) followed by Gynaecology and Obstetrics (18.8%) and Pediatrics (12.2%) ward. Table 1 shows the highest number of whole blood and packed red blood cell transfusion episodes were from Gynaecology and Obstetrics unit followed by Medicine and Surgery.

Table 2 shows the highest number of platelet transfusion episodes were from Medical ward (43.1%) followed by Oncology (18.8%) and Pediatrics (12.9%) Table 3 shows the highest number of fresh frozen

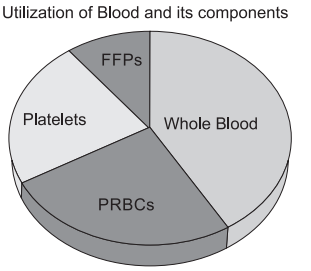

Fig 1: Utilization of blood and its components

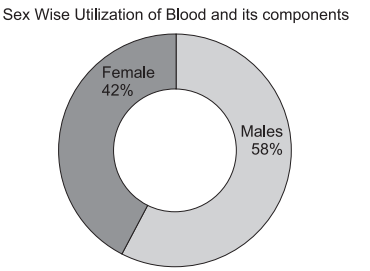

Fig 2: Distribution of transfused blood components by sex

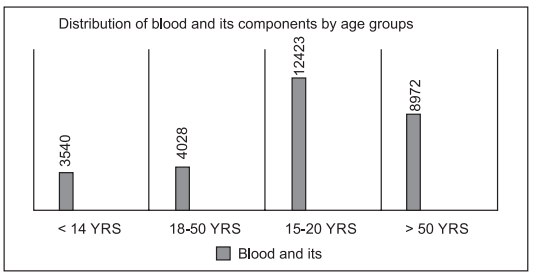

Fig 3: Distribution of transfused blood components by age groups

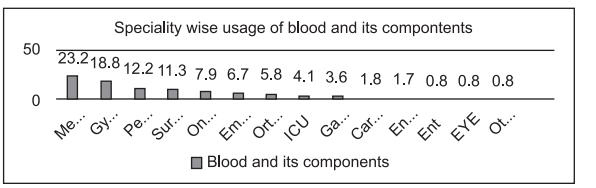

Fig 4: Distribution of blood and its components by speciality

plasma transfusion episodes were prescribed from Gynaecology and Obstetrics (23.1%) unit followed by Pediatrics (19.2%) and Medicine (19.0%).

DISCUSSION

Indiscriminate use of blood and its components is on the rise due to easy availability of blood bank services and inadequate knowledge of transfusion guidelines. Audit of utilization of transfused units has become necessary to identify patterns of blood use.[9] It also form basis for developing strategies to reduce inappropriate transfusions and identifying areas of

Table 1: Specialty wise usage of Whole blood and Packed RBCs.

Specialty	Whole Blood Number of patients receiving transfusions (%age of total)	PRBCs Number of patients receiving transfusions (%age of total)
Gyne & Obstetrics	2800 (23.2%)	1807 (24.8%)
Medicine	2028 (16.8%)	1300 (17.8%)
Surgery	1700 (14.1%)	1069 (14.6%)
Pediatrics	1285 (10.6%)	806 (11.0%)
Orthopedic	1020 (8.4%)	619 (8.5%)
Oncology	620 (5.1%)	408 (5.6%)
Gastroenterology	586 (4.8%)	351 (4.8%)
Emergency	571 (4.7%)	249 (3.4%)
ICU	415 (3.4%)	217 (2.9%)
CRC	324 (2.6%)	200 (2.7%)
Endocrinology	366 (3.0%)	111 (1.5%)
ENT	156 (1.2%)	60 (0.8%)
Neurosurgical Ward	56 (0.4%)	38 (0.5%)
EYE	25 (0.2%)	11 (0.1%)
Dental	21 (0.1%)	09 (0.1%)
CCU	14 (0.1%)	12 (0.1%)
Skin	15 (0.1%)	08 (0.1%)
Others	08 (0.06%)	12 (0.1%)

Table 2: Specialty wise usage of platelets.

Specialty	Number of patients receiving transfusions (%age of total)
Medicine	2814 (43.1%)
Oncology	1231 (18.8%)
Pediatrics	843 (12.9%)
Emergency	753 (11.5%)
ICU	269 (4.12%)
Surgery	197 (3.0%)
Gyne & Obstetrics	138 (2.1%)
Eye	107 (1.6%)
Gastro	62 (0.9%)
ENT	38 (0.5%)
Orthopedic	26 (0.3%)
Skin	15 (0.2%)
CRC	08 (0.1%)
CCU	07 (0.09%)
Others	13 (0.19%)

Table 3: Specialty wise usage of Fresh frozen plasma.

Specialty	Number of patients receiving transfusions (%age of total)
Gyne & Obstetrics	727 (23.1%)
Pediatrics	606 (19.2%)
Medicine	599 (19.0%)
Emergency	392 (12.4%)
ICU	290 (9.2%)
Surgery	232 (7.3%)
Oncology	58 (1.8%)
Nursery	51 (1.6%)
Gastro	44 (1.3%)
Orthopedic	38 (1.2%)
EYE	30 (0.9%)
Neurosurgical ward	25 (0.7%)
CRC	19 (0.6%)
Endo	14 (0.4%)
CCU	08 (0.2%)
Others	10 (0.3%)

further improvement.[3]

Transfusion practices vary from institution to institution. Since there is hardly any data of audit of utilization of blood components from our province, the present study was undertaken to review trends of utilization of blood in order to predict future demands and aid planning for transfusion services. It also helped to identify different specialties where efforts to optimize are most likely to be productive. In our study, the frequency of Whole blood and Packed red blood cell (PRBCs)

issued units was 41% and 25% respectively whereas in the study of India it was 47.15% for PRBCs and 43.06 % for whole blood showing preference and better usage of PRBCs to whole blood in their institution.[10] PRBCs usage is also higher in United states (48.75%), England (44.93%) and Denmark (54.08%) as compared to Pakistan due to trend of use of blood components as compared to whole blood.[11] PRBCs usage in our study was similar to that in Brazil (42%).[12] In the present study platelets units issued (23%)were higher than in India (4.1%)[10] , Australia (3.02%), Denmark (4.68%), United states (5.96%), England (2.03%)[11] and Sweden (7.1%)[13] but lower than in Brazil (40%)[12].Similarly FFP utilization was seen higher in our hospital i.e. 11% as compared to India (5.3%)[10], Australia (5.33%), United States (13.8%), England (5.95%), Denmark (5.16%)[11], Sweden (7.1%)[13] and Spain (6.9%)[14].

Blood and its components usage varied according to ward, institution and practicing doctor. The highest proportions of blood transfusion episodes were from the specialty of Medicine (23.2%) followed by Gynaecology & Obstetrics (18.8%) and Pediatrics (12.2%). While in Brazil ICU (44%) followed by General Admission (29%) and then Emergency room (18%) had maximum transfusions.[12] In our study PRBCs maximum transfusions were performed by Gynaecology & Obstetrics (24.8%) followed by Medicine (17.8%).In Pakistan another study also showed maximum transfusions were from Gynaecology & Obstetrics both in public-sector (59.4%) and private hospital (41.3%)[6] while in Brazil ICU (30%), General Admission (29%) and Emergency Room (27%) had the highest use of red cell transfusions.[12]

In the present study most number of platelet transfusions were done by the specialty of Medicine (43.1%), Oncology (18.8%) and Pediatrics(12.9%) while in Brazil ICU (58%), General Admission (31%) had the highest rate of platelet transfusions.[12] The specialty prescribing most FFP transfusions in our study were by Gyneacology % Obstestrics (23.1%) followed by Pediatrics (19.2%) and Medicine (19.0%) as compared to India where cardiac surgery (27.9%), General Medicine (21.7%) and General Surgery (15.7%) had maximum transfusions.[3] In the developed countries, there has been a decline in the use of PRBCs by 16% due to accurate audit of transfusion and implementation of Better Blood Transfusion programme and acceptance of transfusion triggers by published data and guidelines.[15] Study in UK also showed the overall RBC transfusion has decreased from 45.5 to 36 units.(UK) The decline in blood transfusion demand is likely to demonstrate initial success in programs to improve appropriate use and reduced wastage.[16] A study has reported a 5.2% decrease in in appropriate usage of FFPs following an educational program.[17]

Educational programs in form of seminars and training programs for clinicians and postgraduate students can change their attitude on transfusion practices and result in justified use of blood components. Improvement in usage of FFP has been seen after use of self-educating transfusion request form. Therefore it is high time for Pakistan to change attitude and orientation of doctors by educating through implementation of policies regarding current practices in blood transfusion.[18] Study in India showed that 14.7% of transfusion episodes had in appropriate documentation. Suboptimal documentation of transfusion is associated with unjustified transfusion.[19] Accurate documentation is fruitful to check whether transfusion is justifiable within established guidelines.[20]

The strength of my research is that we audit the frequency of utilization of blood and its components in northern Pakistan where previous no audit was done. It identified high rate of utilization of blood and its components. Therefore there is aggressive need to have strict clinical governance by physicians along with external quality checks to change physician behavior in ordering unnecessary transfusions. Its an hour of need to develop blood management program which focus on implementation of evidence based transfusion guidelines reducing unnecessary costs to hospital and patients. However limitation to transfusion audit was a poor documentation.

CONCLUSION

My study identified high rate of utilization of blood and its components and highlights poor transfusion practices and lack of implementation of guidelines. It also reinforces implementation of blood audit in clinical setting. Judicious implementation of guidelines of blood transfusion may help to decrease high rate of utilization of blood and its components, also minimizing hazards of transfusion and health care cost and increase availability of blood for patients at the right time due to limited resource.

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