RETROSPECTIVE ANALYSIS OF PACKED RED BLOOD CELL TRANSFUSION IN TERTIARY CARE HOSPITAL IN SOUTHERN INDIA

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ABSTRACT

Introduction: Packed Red cells (Packed RBC) forms an important element in the treatment of various medical conditions. RBC transfusions are generally done to treat hemorrhage and also to enhance oxygen delivery to tissues. Transfusion of RBCs should be based on the patient's clinical condition. Our present study was aimed at analyzing the appropriateness of usage of packed red blood cell usage in our tertiary care hospital.

Materials and Methods: This present study was a retrospective analysis of 3000 packed red blood cells issue request forms over the period from august 2017 to October 2017 were analyzed. The appropriate use of packed RBC was assessed by AABB revised guidelines 2016. The transfusion was considered inappropriate if it does not follow these guidelines.

Results: The maximum packed red blood cells were transfused in the department of nephrology no 918 units (19.58 %) followed by department of CT surgery no 793 units (16.91 %) and department of General Medicine no 710 units (15.14 %).Maximum number of packed red blood cells were utilized for elective surgeries i.e. 1323 units (28.2 %) followed by malignancies 1012 (21.6%). Commonest indication in electric surgeries is for Percutaneous Nephro Lithotomy, where as in malignancies commonest indication being the acute myeloid leukemia.

Conclusion: The overall prevalence rate of appropriate usage of packed RBC in our hospital is 62.4%, which is quite lower and also we found out increasing number of single unit transfusions which could have been avoided with proper implementation of guidelines. These retrospective studies are useful to identify the critical areas requiring intervention so that inappropriate usage of blood and components can be minimized.

KEYWORDS: Packed Red Cells, Whole Blood,Appropriate,Transfusion, Cancer.

INTRODUCTION

Blood obtained from voluntary non-remunerated blood donors is a scarce and precious resource, which must be effectively managed and stocked [1].Blood can be separated into various components like packed red blood cells , platelet concentrate and fresh frozen plasma. Among this transfusion of packed red blood cells forms an important element in the treatment of various medical conditions.RBC transfusions are generally done to treat hemorrhage and also to enhance oxygen delivery to tissues. Transfusion of RBCs should be based on the patient's clinical condition.Patients with symptomatic anemia should be transfused if they cannot function without treating the anemia [2].The 10/30 rule—transfusion when a patient has a hemoglobin level less than or equal to 10 g per dl (100 g per L) and a hematocrit level less than or equal to 30 percent—was used until the 1980s as the trigger to transfuse, regardless of the patient's clinical presentation,but it has become obsolete now[3]. But the concept of, transfusion is only indicated when Hb <7 g/dl, has been general accepted in most of the countries in the world [4].Being a precious product it must be used judiciously and carefully. Transfusion of packed red blood cells (packed RBCs) is also associated with risk of transmission of transfusion transmitted infections like HIV, Hepatitis B and C, syphilis and malaria and also associated with the development of febrile non hemolytic transfusion reactions and storage lesions.Therefore blood transfusion should be prescribed only to treat conditions associated with significant morbidity or mortality that cannot be prevented or managed sufficiently by other means[5].To avoid overuse and misuse of blood and components many countries have developed guidelines[5,6,7].Despite the availability of guidelines and protocols ,a high rate of inappropriate use has been reported around the world, both in the developed and developing countries.[8].

AIM OF THE STUDY

Our present study was aimed at analyzing the appropriateness of usage of packed red blood cell usage in our tertiary care hospital

MATERALS AND METHODS

This present study was a retrospective study conducted at department of transfusion medicine and Immunohematology, a tertiary care hospital, Hyderabad, India. Retrospective analysis of the 3000 requisition forms requesting packed red cells were done during the period August 2017 to October 2017. The following data were analyzed from the request forms; age, sex, diagnosis, indication for transfusion, pre transfusion hemoglobin levels, department requesting the units, number of units requested, previous H/o transfusions, h/o adverse reactions. All the packed red blood cells transfused were allogenic. The appropriate use of packed RBC was assessed by AABB revised guidelines 2016[9]. The transfusion was considered inappropriate if it does not follow these guidelines. All request forms with incomplete request forms were excluded from the study.

RESULTS

This study included requisition forms of 3000 patients who received 4688 units of packed red blood cells during the study period from August 2017 to October 2017 from various departments. One unit of packed RBC was considered as one episode of transfusion. Among these 3000 patients 1189 (39.64 %) were females and 1811 (60.36 %) were males. This gender distribution is depicted in Table No.1.

Table No. 1: Gender Distribution of the PRBC utilization

Sex	Number	Percentage
Male	1811	60.36%
Female	1189	39.64%
Total	3000	100

Most of the packed red blood cells were utilized by 31 – 40 years age group patients followed by 61 to 70 age group patients. The mean age for packed RBC transfusion was 39 years. Youngest recipient of PRBC unit was 3monthsbaby, while the oldest recipient of PRBC was 82years old male. This demographic distribution of packed red blood cells was enlisted in Table No.2.

Table No. 2: Age-wise distribution of the PRBC

Age	Number of units	Percentage
1-10	82	1.74%
11-20	433	9.23%
21-30	608	12.96%
31-40	1095	23.35%
41-50	796	16.97%
51-60	597	12.73%
61-70	855	18.23%
71-80	152	3.24%
81-90	70	14.93%

The maximum packed red blood cells were transfused in the department of nephrology no 918 units (19.58 %) followed by department of CT surgery no 793 units (16.91 %) and department of General Medicine no 710 units (15.14 %). This distribution is depicted in Table No. 3.

Table No.3: Department-wise utilization of the PRBC

Department	Number of units	Percentage
Cardiology	163	3.47%
CT Surgery	793	16.91%
EMD	312	6.66%
General Medicine	710	15.14%
Medical Oncology	582	12.41%
Nephrology	**918**	**19.58%**
Neuro Surgery	75	1.591%
Orthopaedic	402	8.57%
Surgical Gasteroenterology	247	5.26%
Surgical Oncology	161	3.43%
Medical GasteroEnterology	143	3.06%
Urology	80	1.70%
Others	102	2.17%

Maximum number of packed red blood cells were utilized for elective surgeries i.e. 1323 units (28.2 %) followed by malignancies 1012 (21.6%). Commonest indication in electivesurgeries isfor PercutaneousNephro Lithotomy, where as in malignancies commonest indication being the acute myeloid leukemia (Table No. 4).

Table No. 4: Various Indications

Indication	Number of units	Percentage
Elective Surgeries	1323	28.2%
Malignancies	1012	21.6 %
Renal Disorders	853	18.19%
Trauma	712	15.2%
Bleeding	360	7.68%
Hepatic Disorders	230	4.91%
Anemia	198	4.23%

Out of these 3000 patients 824 patients were transfused 2 packed RBCunits, 322 patients were transfused more than 2 units. In 914 cases single unit transfusion was noted with even Hb level more than 9gm/dl.Appropriateness of usage of packed red blood cells in our study is 62.4%. It's highest in department of hematology with 88%. Whereas its lowest in department of neurosurgery52%

DISCUSSION

Blood products like packed Red blood cells are of prime importance in the treatment for many medical and surgical conditions. Their inappropriate administration not only leads to wastage of the scarce resource but also will lead to unnecessary exposure of patients to various transfusion risks. Data from many developing countries have shown gross over- ordering of blood, only 40% to 70% of patients were transfused blood from the ordered quantity[10], the reasons could be lack of awareness regarding the role of blood component and guidelines and also fear of immediate risk to the patient. Hence this study was conducted to analyze the appropriateness of packed RBC administration in our hospital.In our study more number of males (60.2%) utilized Packed RBC units than females, which is quite opposite to Sharmaricha etal(30.2%) and giriyanss etal(38%)[11, 12].

In our study maximum number of packed RBC were transfused in the department of nephrology 918 out of 4688 units(19.5%) which varies from other studies by Sharma richaetal [11] , where gynecology and obstetrics accounts for majority of utilization, whereas study by Mahimamittaletashows increased usage in cardiology department[13]. This high utilization of packed RBC in our nephrology department is because our institute is premier centre for kidney transplantation in entire Telangana and Andhra Pradesh in government sector.

In the present study, overall prevalenceof appropriateness of use packed RBC was found to be 62.4% ,which is almost comparable to study by Sharmaricha etal,whereas study by Marticarvajal etal showed lowest prevalence rate of appropriateness (51%), whereas study by wadeetal showed highest prevalence rate of appropriateness[11,14,15].

WHO strongly discourages single unit transfusion to avoid unnecessary risk of transfusion wherever possible but in our study we found high proportion of single unit transfusions ,1985 episodes out of 4688 episodes of PRBC (42%), this can be quite higher than Sharma richa etal 145/790(18%) [11]. But study by JH Vachhani etalshowed high prevalence of single unit transfusions (52.8%) [16].

CONCLUSION

In conclusion the overall prevalence rate of appropriate usage of packed RBC in our hospital is 62.4%, which is quite lowerand also we found out increasing number of single unit transfusions which could have been avoided with proper implementation of guidelines. These

retrospective studies are useful to identify the critical areas requiring intervention so that inappropriate usage of blood and components can be minimized. Conducting awareness programs, CMEs and proper coordination of clinicians with transfusion department and following guidelines can resolve these issues.

Limitations of the study

The lower number of females in our study can be attributed to the fact that absence of gynecology and maternal services in our institute.

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