

## AN AUDIT OF APPROPRIATE USE OF BLOOD COMPONENTS IN TERTIARY CARE HOSPITAL

Sharma Richa\*<sup>1</sup>, Jain Chetna<sup>2</sup>

1, 2. Associate Professor, Department of Pathology, Jhalawar Hospital and Medical College Society, Jhalawar, Rajasthan.

\*Email id of corresponding author- [richasjpr@gmail.com](mailto:richasjpr@gmail.com)

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### ABSTRACT:

**Objective:** Blood is a precious health resource. The decision for blood transfusion is important as there are significant associated complications. This study designed to determine the rate of appropriate use of blood and blood component transfusions in various departments. **Material & Method-** This retrospective study was done in tertiary care hospital in Jhalawar in eastern Rajasthan of northern India.

**Result:** Out of total 902 episodes of blood & blood component transfusions, 565 (62.63%) episodes were appropriate and 337 (37.37%) episodes were inappropriate. Among these fresh frozen plasma transfusion had highest inappropriate [ (8/18) 44.45%] episodes followed by packed red cell transfusions[292/734(39.79%) and platelet transfusion [26/94,27.65%] and whole blood [11/56, 19.65%] **conclusion** : transfusion audit is very important to access the blood utilization pattern in any hospital and judicious implementation of guidelines for the use of various blood components may help decrease their inappropriate use.

**Keywords:** Audit, Guidelines, Blood components, Transfusion.

### INTRODUCTION:

Blood transfusion is the very critical for health care system without which proper medical care is not possible. (1) When used correctly it saves life and improves health. However it also may transmit transfusion transmitted infections and carried a potential risk of acute or delayed complications. Human blood is a scarce and precious resource. 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 mean.(2)

One of the important strategy of the World Health Organisation Blood Transfusion programme(WHO/BTS) is a reduction in unnecessary transfusion through the appropriate clinical use of blood and blood product, and the use of simple alternatives to transfusion, whenever possible.(1)

The WHO recommended developing National policy and national guidelines on effective

clinical use of blood which assist clinician to make decision whether transfuse or not.

However, many countries have developed policies and guidelines on the clinical use of blood[2,3,4,13].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.(5) Proper monitoring of transfusion practice is necessary.

Clinical audit is an important part of quality assurance programme which can provide necessary information for improving transfusion medicine practice. (6) A Retrospective audit can scrutinize combined transfusion data and utilization trends. Every hospital/blood transfusion canter should develop a audit system that is suitable to its need. (7)

With this background, the present audit was designed to assess the reasonable of use of blood component in our institution in Jhalawar, which might lead to the improvement in the transfusion practices.

## MATERIAL & METHOD

This study was conducted at the Blood Bank SAG hospital Jhalawar at a tertiary care hospital in eastern Rajasthan.

This was a retrospective study and all the information regarding transfusion was collected from requisitions form and other medical record of the patient in Blood Bank during study period. The patient records were analyzed for the following factors Age, Sex, clinical diagnosis, department of hospitalization and indication for transfusion of blood product.

The appropriate use of blood product and blood component was assessed by WHO/NACO

guidelines (1,2).An transfusion episode was considered inappropriate if indication and haemoglobin and coagulation was not mentioned and prolongation of PT/PTT was less than 1.5 times that of normal control plasma at the time of request.

## RESULT

This study included 545 patients who had transfusion during defined study period between April 2015 to July 2015 in different department. Among 545 patients 381(69.90%) were females and 164(30.09%) were male patients table-1.

A total 902 transfusion episodes (one unit of blood product was considered as one transfusion) were evaluated. The median age was 25 year age range (from 3 month to 80 year).

Out of total 902 episodes of transfusions of blood components among 545 patients, 734 episodes (81.3 %) were of packed red cell, 56 episodes (6.20%) of whole blood, 94 episodes (10.2%) were of platelet transfusions, 18 episodes of (2%) fresh frozen plasma. During study period no one unit of cryoprecipitate was transfused. (Table no.2). In this study out of total 902 transfusion episodes, 245 episodes (27.16%) were of single unit transfusion of packed RBC and whole blood. PRBC were the most utilized blood component followed by platelet concentrate.

The maximum blood component 415 units were transfused in Department of obstetrics and Gynaecology,148 transfusion episode in General surgery, 135 transfusion episodes in Medicine,124 episodes in Paediatrics and 80 transfusion episodes in Orthopedics, Skin, T.B. Chest departments.[table no. 3]

Inadequate information was provided on the 156 requisition forms regarding to indication, pretransfusion Hb value, and pre-transfusion prothrombin index [PTI], platelet count.

**Table no1:-SEX DISTRIBUTION**

Sex	N0 (%)
Male	164(30.09%)
Female	381(69.90%)
<b>total</b>	<b>545</b>

**Table no:-2 Blood component distribution**

Type of Blood component	N Units (%)
Whole blood	56
Packed red blood cell	734
Fresh frozen plasma	18
Platelets concentrate	94
Total	902

**Table no:-3 blood transfusion episodes in different department**

Department	N (%)
Obstetrics/gynecology	415(46%)
Medicine	135(14.97%)
General surgery	148(16.40%)
Paediatrics	124(13.74%)
Orthopedics	62
Others (ENT, Skin, T.B.Chest deptts.)	18
Total	902

**Table no:-4 Appropriateness and Inappropriateness of various blood component**

Component	<u>Appropriate</u> episodes no. (%)	<u>Inappropriate</u> episodes no. (%)	Total
PRBC	442 60.21%	292 39.79%	734
WB	45 80.35%	11 19.65%	56
FFP	10 55.55%	8 44.45%	18
PC(RDP)	68 72.34%	26 27.65%	94
Total	565 62.63%	337 37.37%	902

The overall prevalence of appropriate use of blood and blood component was 62.63% (565/902), PRBC (60.21%) whole blood (80.35%) platelet concentrate (72.34%) FFP (55.55%). [Table no.-4]

The maximum number of episodes (44.45%) judged inappropriate were that of FFP while next in frequency were PRBC (37.39%).

## DISCUSSION

Blood is scarce resource. Inappropriate transfusion of blood and blood product cause the waste of precious community resources, unnecessarily expose patients to transfusion risks, and reduce the availability of particular blood products for patients who need transfusion support (9). The judgment to transfuse blood or blood products must be based on a careful decision of clinical and laboratory indications

that a transfusion is necessary to save life or prevent significant morbidity (3).

Indiscriminate use of blood component is on rise. Data from many developing countries have shown gross over- ordering of blood in 40% to 70% of patient transfused (8), the apparent reasons are apprehension of immediate risk to the patient and misperception of role of blood component in the treatment. One important tool for improvement of blood transfusion practice is an audit of blood requisition forms and blood component utilization. (3).

In this retrospective audit overall prevalence of appropriate use of blood components has found 62.63%, the maximum number of episodes (44.45% ) judged inappropriate were that of FFP while next in frequency were PRBC (37.39% ) and 27.2% episodes of platelet transfusion.

Other study by Marti Carvajal AJ et al (10) found overall prevalence of appropriate use of blood product was 51% and PRBC and FFP were the blood product with the lowest prevalence of appropriate use. While a study by Wade et al (11) found higher rate (83.1%) of appropriate use of blood component among these, fresh frozen plasma had highest inappropriate (58%), followed by PRBC (35.5%), and Platelet transfusion (6.45%).

In this study we found high proportion of single unit (PRBC/WB) blood transfusion (145 episodes out of 790 episodes of PRBC and Whole Blood). Mostly in these cases pre-transfusion Hb value is 9gm/dl or more than this. JH Vachhani et al (12) reported 52.81% incident of single unit transfusion which is comparable. Although WHO strongly discourages single unit transfusion [1] but still it is plasticizing. According to Austerlition Red Cross blood service" where indicated, transfusion of a single

unit of RBC, followed by clinical reassessment to determine the need for further transfusion, is appropriate. This reassessment also guides the decision on whether to retest the haemoglobin level". (13)

RBC transfusion should not be dictated by Hb concentration alone, but also be based upon on assessment of the patient clinical status. (4).In concern of anemia WHO stated that blood transfusion is used to relieve the clinical signs or respiratory distress, it is not cure for Anemia, but the underlying cause of the anemia still needs to be investigated and treated.[1]

In our study we found 44.45% of inappropriate uses of FFP majority of inappropriate transfusion were not accompanied by coagulation test results as to a guide to the transfusion and for monitoring purposes. It is necessary to do coagulation test studies in order to decide the FFP transfusion.

In few cases FFP had used as plasma expender and as a source of albumin in hypoproteinemic cases in pediatric department, also reasons of inappropriate use. In these conditions risk of FFP transfusion overweighs its potential benefits so should not be used. (14)

The studies done by Shinagare et al (15) and Kulkarni et al (16) showed inappropriate use of FFP 39% and 52% respectively. Plasma transfusion may lead to numerous different adverse events including volume overload, transfusion related acute lung injury (TRALI), transfusion transmitting infections and allergic reactions. These latter reactions can demonstrate a spectrum of severity, ranging from mild urticarial skin rashes to anaphylactic shock (17). Therefore it is recommended that FFP should be used only in case of documented coagulation

defect and which could be managed by a rational amount of FFP.

In the present study, 27.65% episodes of platelets transfusion were inappropriate. Platelet concentrate were indicated in pancytopenia [due to chemotherapy, leukemia, Aplastic anemia] and thrombocytopenia in our region more commonly due to infection like Dengue fever and Malaria. Transfusion was regarded as inappropriate in condition where there was no evidence of active bleeding or no ongoing surgical /invasive procedure and platelets counts more than 20000/dl.

Pretransfusion hematological values and clear indication were not provided in majority of request forms. There is need to conduct regular training programmes for clinicians to improve the information on requisition form.

### CONCLUSION:

It is concluded that there is increasing trend of blood component instead of whole blood and overall prevalence rate of appropriate use of blood component is 62.63% in SRG Hospital Jhalawar eastern Rajasthan.

Retrospective audits are effective tool to increase rational use of blood by identifying areas requiring intervention 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. Awareness program of rational use of blood should be conducted regularly.

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