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USAGE OF BLOOD COMPONENTS IN MEDICAL CARE SETTING IN A TERTIARY CARE CENTER OF NORTH INDIA.

Immunohaematology

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ABSTRACT

Purpose:- To study usage and appropriateness of blood components transfusion in a medical care setting at a tertiary care hospital of North India.
Methods:- The prospective study conducted from Oct,2012 to July,2014 on 500 cases where blood components were transfused in a medical care setting at a tertiary care hospital of North India. By clinical and laboratory parameters, need for blood transfusion was assessed.
Results:- 500 patients underwent blood/blood components transfusion in medical wards. 278(55.56%) patients underwent packed red blood cells (PRBC) transfusion (mean 1.87±1.051 units) out of which 59.4% were appropriate. 119(23.8%) patients underwent platelet concentrate (PC) transfusion (mean 5.02±1.682 units) out of which 60.5% were appropriate. 126(25.2%) patients underwent fresh frozen plasma (FFP) transfusion (mean 2.58±1.046 units) out of which appropriateness was 65.9%.
Conclusion:- The low level of appropriateness of transfusion of blood/blood components warrants sensitization of the health professionals about rational usage of blood/its components.

KEYWORDS

Packed red blood cells, Platelet concentrate, Fresh frozen plasma, Appropriateness.

INTRODUCTION

Blood transfusion is an integral part of health care services. It is a major aspect of the practice of medicine and is frequently a life saving treatment. Inappropriate use of transfusion adds to the cost of disease management. Transfusions should be given only when true benefits are likely as these are not without risks.[1,2] Blood component therapy should be emphasized to make the appropriate use of blood. To ensure the appropriateness of blood transfusion therapy clinical quality assurance programs are necessary.[3,4]

AIMS AND OBJECTIVES

1) To study usage of blood components in a medical care setting in a tertiary care hospital of North India.
2) To carry out an audit of appropriateness of transfusion of blood components with reference to the guidelines.

MATERIALS AND METHODS

A prospective observational study was conducted at a tertiary care hospital of North India on 500 cases. Patients were selected from medical wards receiving any blood component transfusion. Detailed history and examination of the patients were recorded in a predesigned proforma. Three blood components packed red blood cell (PRBC), fresh frozen plasma (FFP) and platelet concentrate (PC) were studied. Study groups categorization based on the pretransfusion values.

Appropriateness of each transfusion episode was assessed based on pre determined criteria as follows:-

I. Packed Red Cells Transfusion[5]

a) Hemoglobin < 7 g/dL.
b) Hemoglobin value between 7 and 10 g/dL, when any of the following symptoms and/or signs are present: syncope, dyspnea, postural hypotension, tachycardia, transient ischemic attack.
c) Hemoglobin >10 g/dL.

II. Fresh Frozen Plasma Transfusion[6]

a) Correction of coagulopathy in a bleeding patient
b) Liver disease: before surgery or other invasive procedure
c) Correction of coagulopathy in any surgical patient: before an invasive diagnostic procedure or before, during or after a surgical procedure.

d) Reversal of warfarin effect: in cases of life threatening hemorrhage or before emergency surgery or an invasive procedure.

III. Platelet Transfusion[7,8,9]

a) Prophylactic Platelet Transfusion

1) Platelets < 10 X 10^9/L without any additional risk factor.
2) Platelet counts < 20 X 10^9/L with risk factors like fever, sepsis, concurrent use of antibiotics, patient on chemotherapy or radiotherapy or other abnormalities of hemostasis.
3) Platelet counts < 50 X 10^9/L with minor invasive procedure, epidural anaesthesia, gastroscopy and biopsy insertion of indwelling lines, transbronchial biopsy, liver biopsy etc.
4) Platelets counts < 100 X 10^9/L in patients with massive transfusion.
5) Platelet counts < 100 X 10^9/L with major surgical procedures like on critical areas such as brain, eyes etc.

b) Therapeutic Platelet Transfusion

1) In patients with bleeding from oral cavity, mucous membranes or any other site and with platelet dysfunction irrespective of their platelet counts.

RESULTS

We reviewed 500 patients in the present study who underwent 523 transfusion episodes of blood components. Overall appropriateness was 61.19%. Most common blood component used was PRBC (Table 1). Most appropriate component used was FFP followed by PC and PRBC (Table 2). Gender has no relation with appropriateness of blood component transfusion.

Table - 1: Blood Components Transfused

Type of Blood Component	Number Of Units Transfused (%)
Packed red blood cells	278 (53%)
Fresh frozen plasma	126 (24%)
Platelet concentrate	119 (23%)

Table - 2: Appropriateness of Blood Components Transfusion.

	PRBC n (%)	FFP n (%)	PC n (%)
Appropriate	165 (59.4%)	83 (65.9%)	72 (60.5%)
Inappropriate	113 (40.6%)	43 (34.1%)	47 (39.5%)
Total	278	126	119

DISCUSSION

Blood transfusion services are the vital part of modern health care system without which efficient medical care is impossible. Overall appropriateness of transfusion of blood components has been found to be 61.19% (320/523) as per the criteria for appropriate transfusion.[5-9]

59.4% of the PRBC transfusions, 65.9% of FFP transfusions and 60.5% of PC transfusions were noted to be appropriate as per the criteria. Comparison with other studies has been shown in Table no 3.

Table 3:- Appropriateness of Blood Component Transfusion in various studies.

study	PRBC	FFP	PC
Martí-Carvajal AJ et al[10]	62.0%	67.0 %	89.0%
OP Arewa[11]	96.6%	64.0%	19.0%
Ankita A. Kataraet. al[12]	76.3%	87.9%	88.0%
Metz J et al[13]	84.0%	76.0 %	87.0%
Tuckfield A et al[14]	84.0 %	69.0 %	87.0%
Wade et al[15]	64.5%	42.0%	93.5%
Present Study	59.4 %	65.9 %	60.5%

In the present study 278 transfusion episodes of PRBC were made, out of which 141 were males and 137 were female transfusion episodes. PRBC transfusion was found to be the maximum episodes of blood component transfusion which was comparable to other studies.[10,11,12].

The present study based on the preset criteria pointed out an appropriateness of PRBC transfusion to be 59.4 % indicating one third of the transfusions to be inappropriate. Martí-Carvajal AJ et al[10] reported similar appropriateness, whereas lower frequency of inappropriate transfusion was also reported.[11-14] The difference in reported frequencies may be due to different criteria by other studies used for analysis.

The present study reports 65.9 % appropriate FFP transfusion. Literature also reported similar appropriateness of FFP transf usion.[10,11,14] While few studies reported a high degree of appropriate FFP transfusion.[12,13] Wade et al[15] reported a high degree of inappropriate FFP transfusion.

60.5 % of the PC transfusions in our study group are appropriate as per the preset criteria. The major cause of PC transfusion was dengue hemorrhagic fever with 41 (34.45%) undergoing transfusion. Literature reported a higher appropriateness of PC transfusion with values well over 80%.[10,12-15] Low percentage of appropriate PC transfusion in present study may be due to higher incidence of dengue hemorrhagic fever with associated fear and apprehension regarding falling platelet count and non-regularized criteria for transfusion. In the present study no correlation of age and gender with the appropriateness was found, which coincided with the literature.[10]

Tuckfield A et al[14] reported that after intervention in form of education, rates of inappropriate transfusion episodes fell significantly (red cells, 16% to 3% [p = 0.004], FFP, 31% to 15% [p = 0.02] and platelets, 13% to 2.5% [p = 0.02]).

The present study showed that almost one third of the study population being inappropriately transfused irrespective of the blood component under consideration. In addition to the wastage of blood component, it also exposes the individual receiving transfusion to diverse adverse effects of the same. Enhanced capacity for component preparation, regular auditing of transfusion practices as well as improved communication between the clinicians and pathologists will lead to more judicious use of blood component therapy as evidence based transfusion medicine alone cannot provide a clinical decision, both of which are inevitable components for success of transfusion. Our audit provides further evidence that this is an on-going problem which needs early and effective remedial action, especially at a juncture where the best efforts of humankind have met a road block to make a true blood substitute.

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