

Acute Transfusion Reactions in Intensive Care Unit: A Retrospective Study

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Abstract: Blood transfusion is a frequent and integral part of critical care. Although life saving it can occasionally be unsafe and results in spectrum of adverse events. Acute transfusion reactions (ATRs) are probably under diagnosed in critically ill patients due to confusion of the symptoms with the underlying disease. This was a retrospective review from Dec 2014 to Dec 2016. The ATRs related to the administration of blood components in the patients admitted to ICU for various reasons were recorded, analyzed and classified on the basis of their clinical features and laboratory tests. During the study period total of 3255 units of whole blood and component transfusion were carried out of which a total of 35(1.05%) ATRs were encountered. Packed Red Blood Cells (PRBCs) and whole blood were most commonly implicated. Allergic reactions were most frequent transfusion reaction noted, seen most commonly with PRBCs and whole blood. This was followed by febrile reactions which were seen most commonly with PRBCs. A rational use of blood and blood products considering their deleterious effects can decrease transfusion related mortality and morbidity in the critically ill patients.

Keywords: ATRs – Acute transfusion reaction, FNHTR - Febrile Nonhemolytic Transfusion Reaction, ICU – Intensive care unit, PRBCs – Packed red blood cells

I. Introduction

Access to adequate and safe blood transfusion facilities is integral to any basic health care delivery infrastructure. They are often lifesaving in critically ill patients. On the contrary, blood transfusions are also inherently embedded with risks ranging in severity from minor to life threatening. Continuous monitoring of transfusion related complications can promote patient care and safety. The goal of hemovigilance was to observe, identify and prevent the occurrence or recurrence of transfusion related unwanted events so as to increase the safety, efficacy and efficiency of the blood transfusion process, covering the entire blood transfusion chain of donors to recipients.² This study was carried out with the objective of observing and analyzing the acute transfusion reactions (ATRs) in the intensive care unit.

II. Materials And Methods

This study was conducted in Multispecialty ICU. An algorithm was already provided in critical care unit, on how to proceed with clinical and laboratory investigations in case of ATRs. A transfusion reaction form was issued along with all blood products containing patients name, age, identification number, and ABO – Rh group of the patient, type of blood product and blood unit registration number. In case of any reaction this form had to be completely filled providing the following information, date, time of starting and stopping the transfusion, when the reaction noted, patients pre and post transfusion vital signs, approximate volume transfused, clinical signs and symptoms. The reaction form along with patients post transfusion blood sample, urine sample and left over blood product bag with attached transfusion set had to be sent back to blood bank. On transfusion reaction occurring during or within 24hrs of transfusion was evaluated. Based on the clinical features mentioned in the transfusion reaction forms and laboratory reports, reactions were classified according to standards and recognized criteria defined by American Association of Blood Bank.³

III. Results

During the study period total of 3325 units of whole blood and component transfusion were carried out. Total number of transfusion reaction was 35 (1.05%). These were observed in age group of 1 to 70 years. Number of transfusion and transfusion reactions noted with various components.

Table 1

Components	No of units transfused	No of reactions
Whole blood	700 (21%)	09
Packed red cells	1785(53.68%)	23

Fresh frozen plasma	400(12%)	02
Platelet concentrate	440(13.23%)	01
Total	3325	35

Distribution of acute transfusion reaction according to type of blood components.

Table 2

Type of reaction	PRBCs	Whole blood	FFP	Platelet conc	Total
FNHTR	08	04	00	00	12(34.28%)
Allergic	12	05	01	00	18(51.42%)
Hemolytic reaction	01	00	00	00	01(02.75%)
Transfusion related sepsis	00	00	00	00	00(00%)
TRALI	00	00	00	00	00(00%)
Non specific reaction	02		01	01	04(11.42%)
Total	23 (65.71%)	09 (25.71%)	02 (5.71%)	01 2.85%	35

Use of blood components in critically ill patients has been the subject of discussion for many years. In our study 53.68% of the transfused units were PRBCs, 21% whole blood, 12% FFP and 13.23% were platelet concentrate. Similarly Rao et al⁴ assessed transfusion practice in 1247 critically ill patients and showed 53% were administered red cells, 22% FFP and 16% platelets. We observed that red cells were most commonly associated with ATRs followed by whole blood, FFP and platelet concentrates with rates of 65.71%, 25.71%, 5.71% and 2.85% respectively.

The incidence of ATRs recorded in our study was 1.05%. Callera et al⁵ and Payandeh et al⁶ recorded low incidences of 0.26% and 0.71% respectively. The incidence of ATRs recorded in our study was 1.05%. Callera et al⁵ and Payandeh et al⁶ recorded low incidences of 0.26% and 0.71% respectively. The repeated transfusions could lead to alloimmunization against the RBC antigen leading to transfusion reactions in emergency ICU patients.⁷ A strong positive relation exists between transfusion reactions and number of units transfused. The most common ATR in our study were FNHTRs 12(34.28%), allergic 18 (51.42%) and nonspecific reactions 04(11.42%). Hemolytic reaction was observed in one patient (2.75%). Incidence of incorrect blood component transfusion has also been reported in the literature⁸. No case of TRALI, anaphylaxis, and transfusion related sepsis was reported. Khalid et al⁹ also recorded similar results with 41.9% FNHTR, 34.4% allergic reactions, 1.8% hemolytic and 5.1% nonspecific reactions. Red cell concentrate were most commonly associated with FNHTR in our study. Febrile reactions result from the interaction of the recipient antibodies with the antigens on donor leukocytes and can be reduced by transfusion of leucoreduced blood products.¹⁰⁻¹² Blood components containing larger amounts of plasma are associated with more severe allergic reactions.¹³ Blood supply is a limited resource that should not be used indiscriminately in our ICU patients.

IV. Conclusion

We have to remember that transfusion although necessary and life saving carries the risks of alloimmunization, transfusion reactions and various other transfusion related morbidities, that could pose a vital threat to already critical patients. A high degree of suspicion has to be kept in case of new symptoms or exacerbation of existing symptoms in a critical patient. Use of only leukocyte depleted components should be in practice.

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