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ORIGINAL ARTICLE

Acute transfusion reactions in intensive care unit

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ABSTRACT:

Background: As the population ages, there is an increasing demand for critical care. In order to treat a condition that causes severe morbidity or mortality and cannot be adequately prevented or controlled by other means, transfusion is a commonly used therapy among critically ill patients. The present study was conducted to evaluate acute transfusion reactions (ATRs) in intensive care unit. **Materials & Methods:** 120 patients admitted to intensive care unit who develop acute transfusion reactions of both genders were selected. Blood and blood products were administered and the number of acute transfusion reactions (ATRs) were noted. **Results:** Out of 124 platelets concentrate transfused, 25 developed ATRs. Out of 85 fresh frozen plasma transfused, 30 developed ATRs. Out of 160 packed red cells, 65 developed ATRs. The difference was significant (P< 0.05). There were 43 ATRs in emergency ICU, 21 in surgical ICU, 36 in medical ICU, 12 in Pediatric ICU and 8 in cardiac ICU. The difference was significant (P< 0.05). With platelet concentrate, fresh frozen plasma and packed red cells, allergic reactions were seen in 10, 7 and 23, hemolytic reactions in 3, 4 and 11, transfusion related sepsis in 1, 4 and 10, FNHTR in 11, 15 and 30 patients respectively. The difference was significant (P< 0.05). **Conclusion:** Transfusions of blood are an essential therapeutic treatment that can endanger patients who are already in critical condition. As a result, close attention must be paid to every transfusion, and ATRs must be identified and treated as soon as possible. Critically ill patients' transfusion-related morbidity and death can be reduced by using these items sensibly in light of their harmful effects.

Keywords: acute transfusion reactions, platelets concentrate, intensive care unit.

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INTRODUCTION

As the population ages, there is an increasing demand for critical care. In order to treat a condition that causes severe morbidity or mortality and cannot be adequately prevented or controlled by other means, transfusion is a commonly used therapy among critically ill patients.[1] Transfusion, on the other hand, is an irreversible process that may benefit the receiver but may carry hazards.[2] A transfusion response is any adverse event that occurs in a patient during or after receiving blood or blood components and for which no other cause can be identified. These undesirable consequences range in severity from minor to severe. Although a safe blood supply has undoubtedly been ensured by improved donor selection and antibody screening, a range of transfusion reactions are still possible.[3]

These reactions might have an abrupt or delayed start and are primarily non-infectious in nature.[4] Acute reactions can be mild, moderate, severe, or potentially fatal, depending on their severity and the proper clinical response. Although the majority happen within or within four hours of transfusion, ATRs happen within 24 hours of transfusion delivery. Both immunologic and non-immunologic reactions are possible.[5,6] Transfusion-related sepsis, circulatory overload, non-immune hemolysis, hypocalcemia, and hypothermia are examples of non-immune reactions, whereas acute immunologic reactions—which are linked to an immune response to antigens on red blood cells, white blood cells, platelets, or plasma proteins—include allergic, anaphylactic, and transfusion-related acute lung injury (TRALI).[7]The present study was conducted to evaluate acute transfusion reactions (ATRs) in intensive care unit.

MATERIALS & METHODS

The study was carried out on 120 patients admitted to intensive care unitwho develop acute transfusion reactions of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Blood and blood products were administered and the number of acute transfusion reactions (ATRs) were noted. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Number of transfusions and transfusion reactions noted with various components

Components	No. of units transfused	No. of reactions	P value
Platelet concentrate	124	25	0.04

Fresh frozen plasma	85	30	
Packed red cells	160	65	
Total	369	120	

Table I shows that out of 124 platelets concentrate transfused, 25 developed ATRs. Out of 85 fresh frozen plasmatransfused, 30 developed ATRs. Out of 160 packed red cells, 65 developed ATRs. The difference was significant (P< 0.05).

Table II Number of transfusion reactions in various intensive care units

Components	No. of units transfused	No. of reactions	P value
Emergency ICU	110	43	0.04
Surgical ICU	64	21	
Medical ICU	85	36	
Pediatric ICU	68	12	
Cardiac ICU	42	8	
Total	369	120	

Table II, graph I shows that there were 43 ATRs in emergency ICU, 21 in surgical ICU, 36 in medical ICU, 12 in Pediatric ICU and 8 in cardiac ICU. The difference was significant (P< 0.05).

Graph I Number of transfusion reactions in various intensive care units

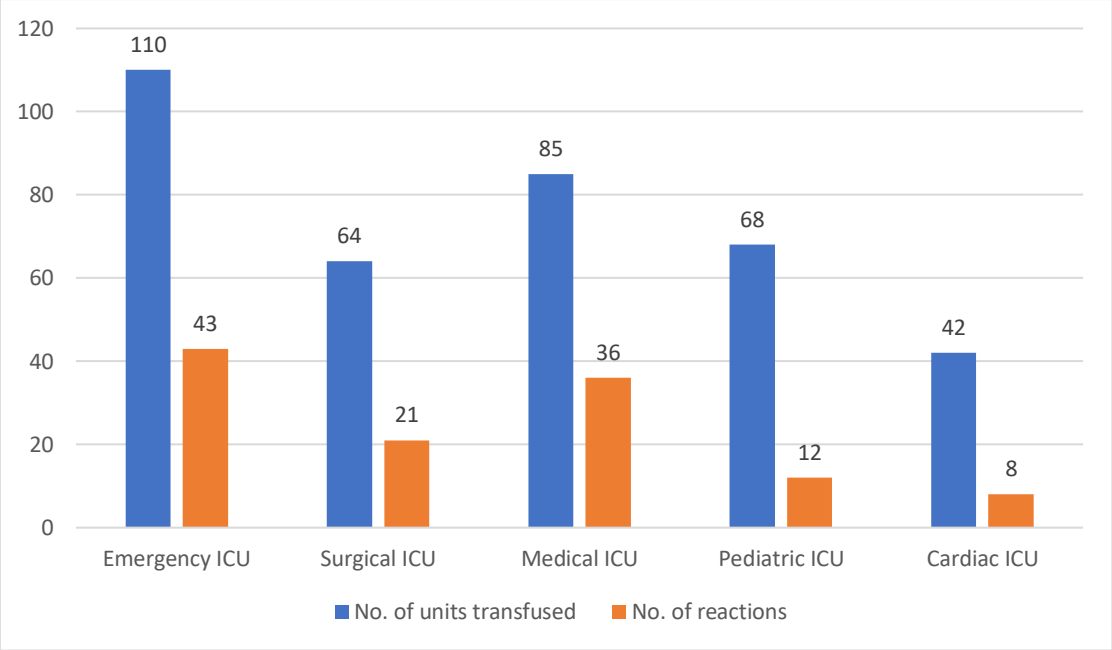

Table III Acute transfusion reactions according to the type of blood components

ATRs	Platelet concentrate	Fresh frozen plasma	Packed red cells	P value
Allergic	10	7	23	0.05
Hemolytic reactions	3	4	11	0.72
Transfusion related sepsis	1	4	10	0.05
FNHTR	11	15	30	0.90
Total	25	30	65	

Table III shows that with platelet concentrate, fresh frozen plasma and packed red cells, allergic reactions were seen in 10, 7 and 23, hemolytic reactions in 3, 4 and 11, transfusion related sepsis in 1, 4 and 10, FNHTR in 11, 15 and 30 patients respectively. The difference was significant (P< 0.05).

DISCUSSION

One of the main causes of morbidity and death nowadays is adverse drug reactions, or ADRs. Mechanisms for monitoring and assessing the safety of medications in clinical use were thought to be necessary in order to prevent and limit these adverse drug reactions (ADRs) and to enhance public health.[8] This was accomplished by implementing a pharmacovigilance system that was well-established and structured.[9] "The detection in the community of drug effects, usually adverse," was the definition given in the 1990s. It might be active (patients and

prescribers are surveyed and recruited) or passive (gathering of spontaneous reports).[10]The present study was conducted to evaluate acute transfusion reactions (ATRs) in intensive care unit.

We found that out of 124 platelets concentrate transfused, 25 developed ATRs. Out of 85 fresh frozen plasma transfused, 30 developed ATRs. Out of 160 packed red cells, 65 developed ATRs. Kumar et al[11]analyzed the incidence and spectrum of ATRs occuring in critically ill patients. The ATRs related to the administration of blood components in the patients admitted in various Intensive Care Units (ICUs) were recorded, analyzed and classified on the basis of their clinical features and laboratory tests. During the study period 98651 blood components were issued. Out of these 21971 were issued to various ICUs. A total of 225 transfusion reactions were reported from the various critical care departments during this period. The most frequent were Febrile Non Hemolytic Transfusion Reactions (FNHTR) 136 (60.4%), allergic reactions 70 (31.2%), hemolytic reactions 1(0.4%) and non specific reactions 18 (8%). The incidence of ATRs in our study was found to be 1.09% in adult ICUs and 0.36% in pediatric ICUs.

We found that there were 43 ATRs in emergency ICU, 21 in surgical ICU, 36 in medical ICU, 12 in Pediatric ICU and 8 in cardiac ICU. Khalid et al[12]determined the frequency and type of Acute Transfusion Reactions (ATRs) occurring in inpatients.All the reactions were clinically evaluated by the blood bank physician. Transfusion reactions occurring during or within four hours after transfusion were evaluated and classified by standard and recognized definitions defined by American Association of Blood Banks.The acute transfusion reactions (ATRs) reported during the study period were 212. However, out of these 212 ATRs, 182 ATRs were confirmed by blood bank physician, and included febrile non haemolytic reactions [89 (41.9%)], allergic reaction [73 (34.4%)], isolated hypotension [3 (1.4%)], haemolytic reaction [4 (1.8%)] and bacterial contamination [2 (0.9%)]. Eleven (5.1%) ATRs were unclassifiable and were thus labelled as non specific reaction.

We found that with platelet concentrate, fresh frozen plasma and packed red cells, allergic reactions were seen in 10, 7 and 23, hemolytic reactions in 3, 4 and 11, transfusion related sepsis in 1, 4 and 10, FNHTR in 11, 15 and 30 patients respectively. Heddle NM et al[13] in their study, patients receiving platelet and red cell transfusions were interviewed before and after transfusion to obtain information about the typical presentation of the syndrome. It was found that transfusion reactions were much more frequently associated with platelet transfusion (30.8%) than with red cell transfusion. The routine use of antipyretics prevented most episodes of fever but did not prevent the occurrence of other symptoms such as chills, cold, and discomfort. The application of logistic regression analysis revealed that the dominant factor determining the risk of a reaction was not white cell contamination, but the age of the component. The significant relationship between reaction and the increasing age of the component suggests that cytokines released in the component during storage may be responsible for many reactions to blood components.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that transfusions of blood are an essential therapeutic treatment that can endanger patients who are already in critical condition. As a result, close attention must be paid to every transfusion, and ATRs must be identified and treated as soon as possible. Critically ill patients' transfusion-related morbidity and death can be reduced by using these items sensibly in light of their harmful effects.

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