International Journal of Research in Health and Allied Sciences
Journal home page: www.ijrhas.com
Official Publication of "Society for Scientific Research and Studies" [Regd.]
ISSN: 2455-7803

ORIGINAL RESEARCH

Evaluation of adverse transfusion reactions following blood product transfusion

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ABSTRACT:
Background: Transfusion reactions are defined as adverse events associated with the transfusion of whole blood or one of its components. Hence; the present study was conducted for evaluating adverse transfusion reactions following blood product transfusion. **Materials & methods:** The present study was conducted for evaluating adverse transfusion reactions following blood product transfusion. A retrospective survey was carried out. All the demographic and clinical details of all the patients were obtained. A Performa was made and type of blood products transfused was recorded separately. Follow-up records of all the patients were evaluated and occurrence of transfusion reaction was noted on excel sheet. **Results:** A total of 890 blood products were transfused. Among these, red blood cells, platelet rich plasma and fresh frozen plasma were transfused in 423, 325 and 142 cases respectively. Febrile non-haemolytic transfusion reaction, Non-immune haemolysis, Allergic reactions and anaphylactic reactions were seen in 25, 3, 17 and 2 cases respectively. **Conclusion:** Febrile non-haemolytic transfusion reaction and Allergic reactions were the most common adverse events seen in patients receiving blood transfusion.
Key words: Transfusion, Reaction

Received: 13 Dec, 2020 Accepted: 19 Dec, 2020

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This article may be cited as: Kumar T, Solanki S, Vadhera M, Kaushal J, Joshi N. Evaluation of adverse transfusion reactions following blood product transfusion. Int J Res Health Allied Sci 2021; 7(1): 82- 84.

INTRODUCTION

Transfusion reactions are defined as adverse events associated with the transfusion of whole blood or one of its components. These may range in severity from minor to life-threatening. Reactions can occur during the transfusion (acute transfusion reactions) or days to weeks later (delayed transfusion reactions) and may be immunologic or non-immunologic. A reaction may be difficult to diagnose as it can present with non-specific, often overlapping symptoms. The most common signs and symptoms include fever, chills, urticaria (hives), and itching. Some symptoms resolve with little or no treatment. However, respiratory distress, high fever, hypotension (low blood pressure), and red urine (hemoglobinuria) can indicate a more serious reaction.[1- 3] Occurring within 24 h after transfusion, they are classified as Acute immune mediated blood transfusion reactions and Acute Non- immune mediated – blood transfusion reactions. Acute immune mediated – blood transfusion reactions are further sub-classified. A haemolytic transfusion reaction is one in which symptoms and clinical or laboratory signs of increased red cell destruction are produced by transfusion.[4- 7] Hence; the present study was conducted for evaluating adverse transfusion reactions following blood product transfusion.

MATERIALS & METHODS

The present study was conducted for evaluating adverse transfusion reactions following blood product transfusion. A retrospective survey was carried out. All the demographic and clinical details of all the patients were obtained. A Performa was made and type of blood products transfused was recorded separately. Follow-up records of all the patients were evaluated and occurrence of transfusion reaction was noted on excel sheet. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Univariate regression curve was used for evaluation of level of significance.

RESULTS

In the present study, a total of 890 blood products were transfused. Among these, red blood cells, platelet rich plasma and fresh frozen plasma were transfused in 423, 325 and 142 cases respectively. Febrile non-haemolytic transfusion reaction, Non-immune haemolysis, Allergic reactions and Anaphylactic reactions were seen in 25, 3, 17 and 2 cases respectively.

Table 1: Details of blood products transfused

Blood products transfused	Number
Red blood cells	423
Platelet rich plasma	325
Fresh frozen plasma	142
Total	890

Table 2: Different type of transfusion reactions

Transfusion reactions	Red blood cells	Platelet rich plasma	Fresh frozen plasma	Total
Febrile non-haemolytic transfusion reaction	19	6	0	25
Non-immune haemolysis	3	0	0	3
Allergic reactions	2	15	0	17
Anaphylactic reactions	2	0	5	2
Others	3	2	3	8

DISCUSSION

Immune-mediated transfusion reactions typically occur due to mismatch or incompatibility of the transfused product and the recipient. They include naturally occurring antibodies in the blood recipient (such as anti-A, anti-B which are typically responsible for acute hemolytic transfusion reactions) as well as antibodies made in response to foreign antigens (alloantibodies). These alloantibodies account for many reactions including mild allergic, febrile non-hemolytic, acute hemolytic and anaphylactic. Antibodies present in the blood donor can also cause reactions and are thought to be involved in transfusion-associated lung injury.[6-9] Hence; the present study was conducted for evaluating adverse transfusion reactions following blood product transfusion.

In the present study, a total of 890 blood products were transfused. Among these, red blood cells, platelet rich plasma and fresh frozen plasma were transfused in 423, 325 and 142 cases respectively. Febrile non-haemolytic transfusion reaction, Non-immune haemolysis, Allergic reactions and Anaphylactic reactions were seen in 25, 3, 17 and 2 cases respectively. Praveen Kumar et al determined the frequency and type of transfusion reactions (TRs) occurring in patients, reported to the blood bank at our institute. All the TRs were evaluated in the blood bank and classified using standard definitions. A total of 380,658 bloods and blood components were issued by our blood bank. Out of the total 196 adverse reactions reported under the hemovigilance system, the most common type of reaction observed was allergic 55.1% (n = 108), followed by febrile non-hemolytic transfusion reaction (FNHTR) 35.7% (n = 70). Other less frequently observed reactions were Anaphylactoid reactions 5.1% (n = 10), Acute non-immune HTRs 2.6% (n = 5), Circulatory overload 0.5% (n = 1), Transfusion related acute lung injury 0.5% (n = 1), Delayed HTRs 0.5% (n = 1). Not a single case of bacterial contamination was observed. The frequency of TRs in their patients was found to be 0.05% (196 out of 380,658). This can be an underestimation of the true incidence because of under reporting.[10] Febrile nonhaemolytic transfusion reactions (FNHTRs) are characterised by an otherwise unexplained rise in temperature of at least 1°C during or shortly after transfusion. Antipyretic premedications may mask a fever, but they do not usually prevent chills and rigors, which are due to cytokine mediated systemic inflammatory response. Other causes of fever should be excluded before making a diagnosis of FNHTR. FNHTRs are seen more often after transfusion of platelets (up to 30% of platelet transfusions) than red blood cells (RBCs) because platelets are stored at room temperature, which promotes leucocyte activation and cytokine accumulation. Treatment of FNHTRs is symptomatic. The prestorage laboratory leucoreduction is useful and is more effective than bedside leucoreduction.[6-9] Negi G et al studied the frequency of various transfusion reactions and the associated morbidity. All ATRs occurring over a period of 3 years at a tertiary care health center were studied in detail according to the institute's protocol. Of 38,013 units of blood and components that had been issued, 101 (0.2%) cases had an ATR. The most common reaction was allergic - 34/101 (33.6%) followed by febrile - 26/101 (25.7%). Other reactions included transfusion-related acute lung injury in 6/101 (5.9%) cases, and immune reactions were seen in 19/101 (18.8%) cases. Allergic and febrile reactions are most common and least harmful, but fatal reactions can also occur, and preventive measures must be taken to avoid such reactions.[11] According to Geiger and Howard, the most common acute adverse reactions to blood component transfusions, febrile nonhemolytic transfusion reactions (FNHTRs), and allergic reactions, are fortunately among the least harmful. The most common bedside approach for the prevention of febrile nonhemolytic and urticarial transfusion reactions is premedication with an antipyretic and an antihistamine, most commonly acetaminophen and diphenhydramine, and at their institution, where most transfusions are administered to pediatric oncology patients, they have observed a rate of 68%. In a study by Sovic et al., febrile nonhemolytic and allergic reactions were quite equally represented, 49.5% each and as for other reactions (1%), one transfusion-associated circulatory overload, and one TRALI were recorded.[12, 13]

CONCLUSION

Febrile non-haemolytic transfusion reaction and Allergic reactions were the most common adverse events seen in patients receiving blood transfusion.

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