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ACUTE TRANSFUSION REACTIONS: A RETROSPECTIVE STUDY IN A TERTIARY CARE CENTRE IN CENTRAL INDIA

Transfusion Medicine

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ABSTRACT

Introduction-Blood transfusions help to save millions of lives every year and is one of the most common procedure done in hospital. However adverse transfusion reactions are frequently linked to their use. The severity of these adverse transfusion reactions can range from minor to life-threatening depending on the type of reaction and the recipient's sensitivity. adverse transfusion reactions must be identified in order to make transfusions safe and limit their frequency **Methods-**In order to monitor adverse transfusion reactions in a tertiary care hospital over one and a half years, a retrospective observational study was done including all critically ill patients who received blood and blood components in the hospital. **Results-**2628 transfusions were analysed in which 70.3% were packed red blood cells (PRBCs), 9.6% were whole blood, 7.1% were platelets, and 13% were fresh frozen plasma (FFP). A total of 14 transfusion reactions were documented. ATR incidence was 0.53 %. Allergic reactions were the most common transfusion reaction, followed by febrile non hemolytic transfusion reaction (FNHTR), anaphylactic reaction, transfusion related circulatory overload (TACO) and acute hemolytic transfusion reaction (AHTR) respectively. Highest proportion of adverse reactions were seen with whole blood. **Conclusion-**In our study, transfusion reactions occurred in 0.53 %. Due to underreporting and the clinician's own handling of cases, the true incidence may be underestimated. Transfusion safety will be improved through judicious use of blood, better storage conditions, bedside monitoring of transfusion, and reporting of adverse occurrences. It became clear that in order to improve patient care, there is a need for increased awareness of the importance of safe blood transfusions and the adoption of suitable haemovigilance systems.

KEYWORDS

Blood transfusion, blood components, adverse transfusion reactions, Transfusion safety

INTRODUCTION-

When it comes to saving lives, transfusion medicine frequently takes the initiative, especially when dealing with critically ill patients[1]. To aid patients with life-threatening disease survival and a higher quality of life, transfusion support is crucial throughout challenging medical and surgical operations. Additionally, it plays a crucial part in the care of mothers and children as well as the control of crises brought on by natural and man-made disasters. Despite playing many vital roles, it also entails the danger of undesirable events[2]. A transfusion reaction is defined as any untoward event occurring during or after the transfusion of blood or blood components. adverse transfusion reactions may range from minor complications to fatal situations[1]. Acute blood transfusion reactions are still a cause for concern because they are predicted to occur in 0.2–10% of cases and result in 1 death every 250k[3]. The severity of these adverse transfusion reactions can vary depending on the type of reaction and the transfusion recipient's sensitivity. Transfusion reactions are divided into immediate and delayed types depending on their time of onset, and into immune and non-immune types based on their aetiology[4]. Acute or immediate reactions are those occurring within 24 hours of the transfusion. Acute transfusion reactions can be further classified into acute haemolytic transfusion reaction (AHTR), febrile non haemolytic transfusion reaction (FNHTR), allergic reactions (including anaphylaxis), transfusion related acute lung injury(TRALI),), transfusion associated circulatory overload (TACO). An acute transfusion reaction can show symptoms including itching, urticaria (hives), fever, and chills. Red coloured urine, high-grade fever, hypotension, and respiratory distress all point to a more serious reactions[4].

Professionals in transfusion medicine have given transfusion-transmitted diseases a great deal of attention, yet developing nations still lack significant advancements to reduce avoidable transfusion accidents[5]. Furthermore, transfusion-related adverse events are not mandated to be reported, therefore the exact number is unknown[6]. Transfusion reactions can be avoided by adhering to the accepted blood transfusion protocols before, during, and after the transfusion. Because of this, the blood replacement therapy requires a high level of competence to provide optimal recipient protection[4]. In order to determine the scope of the issue and identify trends that can be used to suggest best practises and interventions for patient care and safety, reports of unexpected events or reactions in recipients of blood and blood products must be collected and evaluated. Therefore present study aims to study of immediate transfusion related adverse events related to blood or blood components transfusion in a tertiary care centre.

Aim-

A study of immediatetransfusion related adverse eventsrelated to blood or blood components transfusion in a tertiary care centre - A retrospective analysis.

Objectives-

1. To determine the incidence of transfusion related adverse events in patients receiving blood transfusion.
2. To analyse the frequency and type of transfusion related adverse events occurring in patients receiving blood transfusion.

MATERIAL AND METHODS-

Study Design- A Retrospective Observational Study

Study Period- One and half years in Index Medical College, Indore (M.P.)

Sampling Method and size- Study sample included all critically ill patients who required blood transfusion during study period. During the study period a total of 2628 transfusion were done in our centre.

Data Management- Data was collected and entered simultaneously in statistical package for social sciences (SPSS) version 23 and coded appropriately. Descriptive statistics were calculated to summarize the sample characteristics in terms of frequency and percentage. Analytical and inferential analysis was applied between dependent variable and other independent variables. Significance was set at standard 0.05.The number of cases of a certain adverse transfusion reactions divided by the total number of transfusions was used to compute the incidence rate of adverse transfusion reactions.

RESULTS AND OBSERVATIONS-

A total of 2628 units of blood and blood products were transfused to the patients admitted at Index medical college and Research centre, Indore during the study period of one and a half years. Among those 2628 units transfused, 1847 (70.3%) were packed red blood cells, followed by 342 (13%) fresh frozen plasma, 253 (9.6%) whole blood and 186 (7.1%) platelet concentrates . A total number of acute transfusion reactions reported were 14 (0.53%) during the study period, of which 4 were seen in males and 10 in females. Mean age of the study participants was 42±15 years and range was 18-69 years. Majority of the study participants with transfusion reactions were more than 30 years of age and had AB+ blood group.Majority of the reactions were seen in females. Most common indications/diagnosis for blood transfusion was Anaemia (28.6%), Haemorrhoids (28.6%) followed by antepartum haemorrhage (14.3%). Majority of the blood transfusion were requested by department of medicine (35.7%) followed by Surgery (28.6%), Paediatrics (14.2%), Obstetrics & gynaecology (14.3%) and orthopaedics (7.1%). Of all the transfusion reactions that were reported to our blood bank during the study period,

majority of transfusion reactions occurred with whole blood (57.1%) followed by packed red blood cells (21.4%), platelet rich plasma (PRP) (14.3%) and FFP (7.1%) respectively. Among these transfusion reactions, commonest was allergic reaction in 6(42.8%) patients followed by febrile non haemolytic transfusion reaction in 4 (28.6%) patients and anaphylactic reaction in 2 (14.2%) patients respectively. In our study, one of the patient had each (7.2%) transfusion associated circulatory overload (TACO) and acute haemolytic transfusion reaction.

Allergic reaction were the most common reported and comprised of 42.8% of all reactions. In allergic reactions, clinical signs and symptoms observed were rashes followed by urticaria, pruritus and puffiness.Allergic reaction was most commonly seen with whole blood followed by platelets and FFP.

FNHTR was seen in 28.6% of the patients. FNHTR comprised of symptoms such as tachycardia, fever, dyspnoea, chest pain and chills and rigors and it was most commonly seen with packed red blood cells followed by whole blood.

All the anaphylactic reaction were seen with whole blood and the acute haemolytic transfusion reaction along with TACO were seen with packed red blood cells. Anaphylactic reaction presented as rashes, pruritis and puffiness and acute haemolytic transfusion reaction presented as dyspnoea, chest pain and nausea.

DISCUSSION-

A blood bank and a clinician requires collaboration to report adverse events. It mostly depends on awareness of transfusion protocols, risks associated with using blood and blood components, timely detection of an event connected to blood transfusion with clinical management, and additional blood bank investigations.Information on various transfusion reactions was collected for the current study. All of these were then assessed using a predetermined methodology based on clinical history and laboratory tests.

Incidence of transfusion reaction in present study was 0.53%. Vaithy et al(9) in their study reported transfusion reactions incidence of 0.95%. Pahuja et al(10) and Bhatacharya et al(13) in their study reported slightly lower incidence of 0.19% and 0.18% respectively. Sahiti et al.(12) reported a much higher incidence of 1.17%.

Study	Incidence of ATR
Present study	0.53%
Vaithy et al[7]	0.95%
Pahuja et al[8]	0.19%
Bhatacharya et al[9]	0.18%
Sahiti et al[10]	1.17%
Sahoo et al[11]	0.16%
Chavan SK et al[12]	0.34%
Sinha et al[13]	0.27%

Study		Total	Whole blood	Packed cells	Platelets	FFP
Present study	Units	2628 (100%)	253 (9.6%)	1847 (70.3%)	186 (7.1%)	342 (13%)
	ATR	14 (0.53%)	8 (3.16%)	3 (0.16%)	2 (1.08%)	1 (0.29%)
Sahoo et al 10	Units	38304	-	14221 (37.12%)	12143 (31.71%)	10328 (26.96%)
	ATR	61 (0.16%)	-	46 (0.32%)	5 (0.04%)	7 (0.06%)
Pahuja et al [8]	Units	60937	28098	-	6495	27320
	ATR	314 (0.19%)	165 (0.58%)	-	2 (0.033%)	8 (0.587%)

In present study, majority of the study participants were females and were more than 30 years of age. Mean age of the study participants was 42±15 years and range was 18-69 years. Sahiti et al[10] also reported that majority were females and in the age group of 19-55 years. In accordance with our results, Vaithy et al[7], in their study reported female preponderance, age range of 12-81 years and mean age of 52±22.5 years.

Majority of the study participants with transfusion reactions were AB+ (35.7%). Similar results were reported by Vaithy et al[7] with high incidence of ATR occurring in recipients with AB positive group (34%) . Contrast to our findings, Sahiti et al[10] reported that majority of the reactions were in seen in B+ blood group.

Most common indications/diagnosis for blood transfusion was Anaemia (28.6%), Haemorrhoids (28.6%) followed by antepartum haemorrhage (14.3%). In a study done by Vaithy et al[7], majority of transfusion occurred in patients with anaemia followed by dialysis and elective surgical procedures which is in accordance with our findings. Similar results were also reported by Sahiti et al[10].

The majority of transfusion reactions (TRs) that were reported to our blood bank throughout the study period involved whole blood (57.1%), followed by packed red blood cells (21.4%) and platelet rich plasma (PRP) (14.3%). TR was only observed in one case involving fresh frozen plasma (FFP) infusions. Similar to our results, Balasubramanian et al [14]reported majority of transfusion reactions were from whole blood (66.66%) followed by PRBC (29%), platelets (4.84%) and FFP (4.84%). In contrast to our findings, Vaithy et al[7], in their study reported packed red blood cell transfusion showed common association with adverse reactions 66% and whole blood in 50% followed by platelet concentrates (PC) in 19%.

In present study most frequent were allergic reactions, which affected 6 patients (42.8%), followed by FNHTR in 4 patients (28.6%) and anaphylactic reactions (14.2%). One patient in our study experienced each TACO and an acute haemolytic reaction. No TRALI was seen in present study. Similar results were reported by Chavan SK et al[12] in which allergy was most common transfusion reaction (55.6%) followed by FNHTR (33.3%). Sinha et al[13] also reported allergic reactions as most common followed by FNHTR. In contrast, Vaithy et al[7] in their study reported 69% showed FNHTR, 21% showed allergic reactions and 2% cases had AHTR.

SUMMARY AND CONCLUSION-

In our study, incidence of transfusion reaction was 0.53%. According to the study's findings, there was a low rate of adverse transfusion responses, which suggests that the healthcare system likely underreported the cases. This would be because individuals were unaware of the significance of monitoring and reporting adverse transfusion reactions involving blood or blood components. This study emphasises the value of judicious use of blood and its constituents, better storage conditions, bedside transfusion monitoring and documentation of adverse events, as well as the installation of the haemovigilance system, all of which contribute to increased transfusion safety. Timely management and reporting of these responses are made possible by proper monitoring and knowledge of the adverse transfusion reactions signs and symptoms. In order to establish an effective haemovigilance system and deliver patient care, it is the combined responsibility of the blood transfusion consultant and their clinical counterpart to raise knowledge about safe transfusion services. To enhance the reporting practise, it is necessary to conduct continuous educational programmes (CEP) for healthcare providers. The study offers information on the many types of adverse transfusion reactions, as well as their severity and causes.

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