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Pathology

REDUCTION IN THE INCIDENCE OF TRANSFUSION REACTION BY TRANSFUSION OF BLOOD COMPONENT VS WHOLE BLOOD: A RETROSPECTIVE COMPARATIVE STUDY IN A TERTIARY CARE MEDICAL COLLEGE FROM NORTH INDIA

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ABSTRACT

Background: National blood policy requires setting up a blood component monitoring & evaluation system to ensure quality blood & blood component supply. This is achieved by haemovigilance programme run by National Institute of Biologicals where data regarding transfusion reaction is reported.

Objective: The objective of this study is to monitor transfusion reactions & create awareness regarding blood component use instead of whole blood among health care professionals.

Aim: To find out the comparative incidence of transfusion reaction by blood component and whole blood and to find the reduction in the incidence of transfusion reaction with the use of blood component as compared to whole blood with the aim to improve Blood Transfusion Services (BTS) for safe blood supply & to encourage appropriate clinical use of blood components.

Materials & Methods & statistics: The study was conducted in Blood Bank SHKM Govt. Medical College Nalhar. The data was collected from August 2016 to December 2019. It was a retrospective comparative study. Total number of Blood unit collected were 19,426 and blood unit transfused to the patients were 23,256 unit (Whole blood- 7,836 unit {33.6%} & blood Component-15,420 {66.4%} during the study period. Transfusion reactions reported during this period were 62 (0.266 %), out of which 50 (80.64 %) were from Whole blood 10 from PRBC, & 02 from FFP (19.35% from all components).

Results: All the reported transfusion reaction were mild reactions, either FNTHR or allergic reactions mainly. Four fifth of transfusion reaction occurred from 33% (1 part) of total transfusion (from Whole blood) whereas nearly one fifth of transfusion reaction occurred from 66% (2 part) of total transfusion (from all the transfused components) The incidence of Transfusion reaction was more with whole blood compared to blood components.

Conclusion: The frequency of TRs in our patients was found to be 0.266% (62 out of 23,256). There is reduction in the incidence of transfusion reaction with the use of blood component as compared to whole blood. The awareness amongst clinical counterpart will benefit in understanding the appropriate clinical use of blood components. Proper filling of Transfusion reaction forms with the necessary details, both positive and negative findings of reaction & investigation of transfusion reactions as per laid down procedures needs to be strictly adhered to. Use of blood components instead of whole blood should be encouraged.

KEYWORDS : TR, WB, PRBC, FFP, PC, FNHTR, AHTR, DAT, IAT, TRALI TACO, Incidence

INTRODUCTION:

Transfusion of blood components is a double-edged sword, so it should be used judiciously. Though blood transfusion can be life-saving, it can also lead to certain adverse reactions which can be fatal. There has been a concern and debate in the medical literature regarding the appropriate use of blood and blood components.[1] There is limited high-quality evidence of the benefits and harms of different blood component transfusion practices that exist throughout the world.[2] Knowledge about various types of blood transfusion reactions (TRs) will help not only in their early identification and management, but also in taking adequate measures to prevent the same. The true incidence of these reactions is difficult to determine because of lack of a proper and strict hemovigilance system throughout the country. With the introduction of newer immunohematological techniques in antibody identification and wider use of leuko-reduced blood components the incidence of febrile non-hemolytic transfusion reactions (FNHTRs) and platelet refractoriness has decreased.[3] The improvements in donor screening for infectious diseases has led to a decrease in the risk of infectious complications. But the risks of non-infectious complications have become more apparent.[4] Often, prevailing disease condition in the transfusion recipient makes the definite diagnosis of TRs even more difficult.[5] About 0.5-3% of all transfusion reaction results in some adverse events, but most are minor without any significant consequence.[6,7] Hence the present study was done with the primary objective to determine the comparative incidence of Transfusion reaction from Blood Component and Whole Blood and to find the reduction in the incidence of transfusion reaction with the use of blood component as compared to whole blood at a tertiary care hospital from North India.

MATERIALS AND METHODS

Study Design

This was a retrospective comparative study conducted by Department of Blood Transfusion (Pathology) Shaheed Hasan Khan Mewati Government Medical college Nalhar, which is a tertiary care hospital from North India from August 2016 to December 2019.There is no ethical issue in this study. All technical support is provided by the staff posted.

Data Collection

This study used the data registered in donor register who came for the blood donation either in blood bank or at voluntary blood donation camp, Blood Issue record register and transfusion work up record register The data include the number of donors and the number of blood units issued to the patients both whole blood and blood component and transfusion reaction details between the years 2016 (August) and 2019 (December). For this study details of transfusion reaction from blood and blood component include year wise different blood and blood component issued, and parameter like age, sex, marital status, religion, indication for blood transfusion, type of blood and blood component transfused, different department / ward from where reaction reported, Blood Group, type of reaction, clinical sign and symptoms.

Statistical (Data) Analysis

The statistical analysis was carried out using statistical package for social sciences (SPSS Inc, Chicago, IL,US;version 15.0 for Windows).Scores were presented as percentage. Qualitative or categorical variables (eg age and sex were described as frequencies

and proportions. Kruskal-Wallis test was applied to find if difference/variance exists between scores. Then Mann-Whitney test was applied to check this for statistical significance. Proportions were compared using chi-square or Fisher's exact test as applicable. All statistical tests were two sided and were performed at a significance level of 0.05.

Descriptive Analysis

A comparative review of all the Transfusion Reactions that were reported to the blood bank at the Shaheed Hasan Khan Mewati Government Medical College Nalhar Haryana India, over a period of 3 years and 5 months (from August 2016 till December 2019) was done. All the reactions were clinically evaluated by the treating physician and reported to the blood bank in a pre-designed performa as per format derived from the guidelines laid down by the Directorate General of Health Services Technical Manual, Ministry of Health, Government of India incorporated in standard operating procedure for transfusion reaction work up in the blood bank.

As a part of transfusion reaction work up and evaluation, the following information was collected:

1. Patient's identification (Name, Age, Sex, Centralised Registration number and Ward).
2. Clerical error checked by reconfirming and matching the implicated whole blood and blood component and details of the patient transfused.
3. Returned bag along with transfusion set is checked for visible clots or hemolysis.
4. Patient's post-transfusion sample is checked for hemolysis and compared with pre-transfusion sample.
5. In case of suspected hemolytic reaction, further investigations done are:

- Complete hemogram
- Quantitative estimation of plasma hemoglobin
- Serum Haptoglobulin
- Hemoglobinuria: gross visual examination and urine haemoglobin
- Serum unconjugated bilirubin: Blood sample should be collected within 1 hour after the occurrence of reaction.
- Coagulation profile
- Serum Urea and Creatinine
- Electrolytes
- Chest X ray
- Peripheral blood smear examination for the presence of schistocytes and spherocytes.

6. Compatibility testing is repeated on pre- and post-transfusion sample. Direct antiglobulin testing (DAT) (using polyspecific Antihuman globulin and monoclonal anti C3, Bio-Rad) and and indirect coombs test (IAT) is also done.

TRs occurring during or after transfusion were evaluated. On the basis of reporting by the treating physician of signs and symptoms accompanied by the blood bank workup, the reactions were classified in accordance with the standards and recognized definitions defined by the guidelines laid down by the Directorate General of Health Services Technical Manual, Ministry of Health, Government of India and American association of blood banks (AABB).[8] Any transfusion-related adverse events occurring within 24 hour were considered as acute TRs while those occurring after, 24 hour were considered as delayed reactions. Febrile non-hemolytic transfusion reaction (FNHTR) was defined as "a body temperature rise of >1°C occurring in association with transfusion with or without chills/rigors and without any other explanation". Rigors and other symptoms in the absence of fever were also included as FNHTR.[8] Allergic reactions comprised urticaria or erythematous itchy or non-itchy lesions, not accompanied by fever or other adverse findings. Anaphylactic reactions were categorized as those having systemic symptoms including hypotension and/or loss of consciousness and/or shock.[8] Transfusion related acute lung injury (TRALI) was considered as reaction with acute respiratory insufficiency and/or X-ray findings consistent with bilateral pulmonary edema but with no other evidence of cardiac failure or a cause for respiratory failure. Hemolytic reactions were diagnosed based on the clinical and/or laboratory evidence of hemolysis and DAT testing. Volume overload referred to respiratory distress leading to pulmonary edema on chest X-ray.[8]

RESULTS

Data Analysis

From August 2016 to December 2019, a total of 23,256 units of blood and blood components (7,836 whole blood and 15,420 blood component) were transfused to the patients admitted at SHKM GMC Nalhar. The number of different blood components transfused is given in Table 1

Table 1
Details of Blood and component issued from blood bank during the study

Years	Whole Blood	Blood Component			P-Value
		PRBC	FFP	PC	
2016 (Aug-Dec)	1786	118	10	07	.049
2017	2872	2139	560	378	.022
2018	1772	4025	674	364	.022
2019	2747	9589	819	266	.026

The various blood and components were issued to the patient as per requirements by clinicians. The various indications of blood component transfusions, implicated in adverse TRs, have been depicted in Figure 1.

Statistical analysis with percentage and Chie-Square Test P < 0.05;Df=1 is depicted in Table 2-3

Table- 2
Status Of Age Group, Religion,Marrital Status,Sex,No. of TR

Age Group (Yrs)	**N= 62**	**%**	**P-Value**
1- 10	1	1.66	<0.05 Sig.
11 – 20	8	12.9	
21 – 30	33	53.25	
31 -40	7	11.19	
41-50	8	12.9	
51-60	1	1.66	
61-70	4	6.4	
Chie-Square Test P < 0.05;Df=1			
Religion	**N=62**	**%**	**P-Value**
Hindu	17	27.41	<0.05 Sig.
Muslim	45	72.58	<0.05 Sig.
Christian	0	-	--
Other	0	-	--
Marital Status			
Marital Status	N= 62	**%**	**P-Value**
Married	56	90.32	<0.05 Sig.
Unmarried	4	6.04	<0.05 Sig.
Widower/ Widow	2	3.02	NS
Sex	**N=62**	**%**	
Male	52	83.87	
Female	10	16.12	
Transgender	0	-	
Total Transfusion Reaction N= 62			
Type of Blood Vs Component	**N= 62**	**%**	
Whole Blood	**50**	80.64	
Blood Component			
PRBC	10	16.12	
FFP	02	3.02	
PC	00	-	

Table- 3
Chie-Square Test P < 0.05;Df=1
Department/ward from which reaction reported

Department	**N= 62**	**%**
Obs & Gynae	33 (4* in ICU)	53.22
Medicine	10	16.12
Ortho	13 (1* in ICU)	21.66
Surgery	4	6.67
Tb & Chest	1	1.67
PICU	1*	1.67
ICU	6*	9.68
Indication of Blood Transfusion Reaction (N= 62)		
Indication of Blood Transfusion	**N= 62**	**%**
Anemia (in all patients from all department)	**42**	67.74
Other Gynae condition	8	12.90

Orthopedic indication	2	3.22
Surgical Indication	8	12.90
Other medical indication except anemia	2	3.22

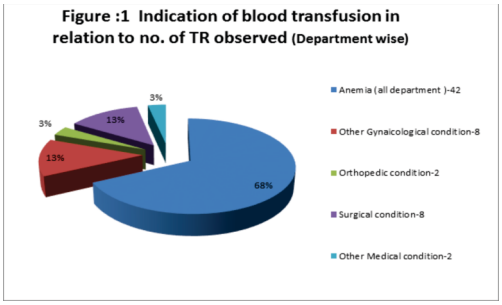


Figure 1: Department wise indication of transfusion in relation to number of TR observed

The total number of TRs reported to our blood bank during the study period was 62 (0.266 %), of which, 10 (16.1%) were seen in males and 52 (83.9%) in females. Mean age was 23 years (range 1.5 -70 years). Out of 62 reaction observed 58 was seen in in married patient and 4 in unmarried patient.TRs occurring in various age group is depicted in Table 4

Table 4

TR occurring in relation to age group and sex ,religion, marrital status and Blood Group

YEARS (Age Group)	NO. OF TR	SEX		RELIGION			MARRITAL STATUS			BLOOD GROUP	
		Male	Female	Muslim	Hindu	Other	Married	UnMarried	A	B	O	AB
1-10	1	1	0	1	0	0	0	1	0	0	1	0
11-20	8	3	5	6	2	0	5	3	1	4	2	1
21-30	33	1	32	28	5	0	33	0	9	13	8	3
31-40	7	1	6	4	3	0	7	0	1	6	0	0
41-50	8	4	4	5	3	0	8	0	1	3	2	2
51-60	1	0	2	0	2	0	1	0	0	0	1	0
61-70	4	0	3	1	2	0	4	0	0	0	4	0

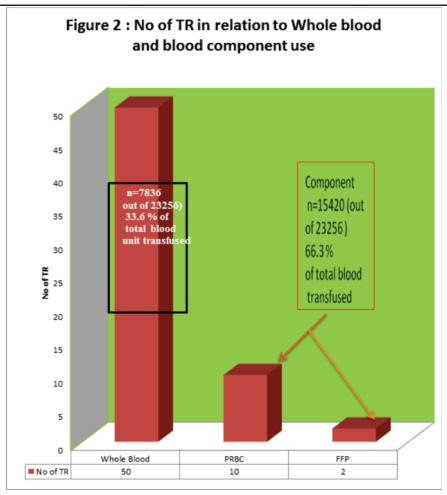
The mean volume of blood component transfused, when the reactions were noted, was 90 ml. 61 out of 62 reactions were of immediate / acute type with the mean time at which reaction was noted, being 38 minute (range 5-450 minute). One delayed type of reaction was noted 27 hour 30 minute after initiation of transfusion. Of all the TRs that were reported, 80.6% (50 out of 62) occurred with Whole blood and 19.4 % (12 out of 62) occurred due to blood components 10 by packed red blood cells (PRBC), 02 by fresh frozen plasma (FFP) transfusions while there was no reaction reported with platelet concentrate (PC). Overall 0.63% of WB , 0.077% of blood component (PRBCs and, FFP) issued from the blood bank and transfused to the patient during the study period were involved in causing TRs. Table 5 depicts the number of TRs according to the type of blood component involved.

Table 5

Different type of TR according to type of blood transfused

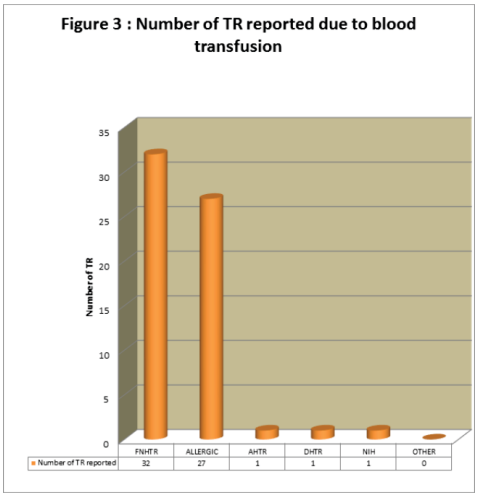
TR	Whole Blood		Blood Component				Total	P-Value
	No.	%	PRBC		FFP			<0.05 Sig
			No.	%	No.	%		
FNHTR	24	38.7	8	12.9	0	0	32	0.024
ALLERGIC Reaction	24	38.7	1	1.6	2	3.2	27	
Non Immune Hemolysis	0	0	1	1.6	0	0	1	
AHTR	1	1.6	0	0	0	0	1	
DHTR	1	1.6	0	0	0	0	1	
Other (TRALI,TACO, Anaphylactic, Immune modulation, Sepsis)	0		0		0		0	

Transfusion reaction caused by transfusion of whole blood as compared to transfusion of blood component was comparatively more.

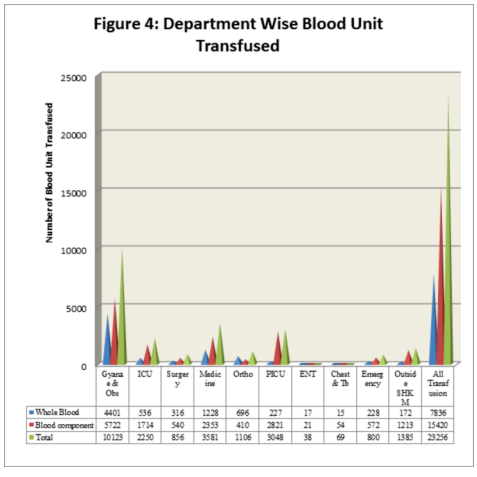


Figures 2 show relative frequency of adverse transfusion reactions by WB and blood components (PRBC, FFP) respectively.

Among these, the commonest was FNHTR in 32 subjects (51.6%), followed by allergic reaction in 27 patients (43.5%). Relative frequency of various TR observed in our study is depicted in Figure 3.



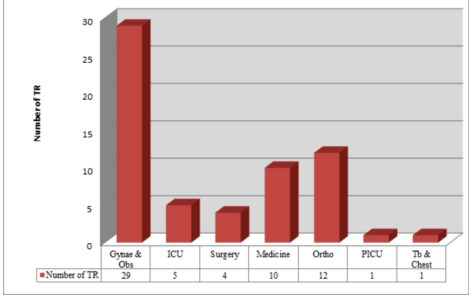
Majority of the blood transfusion to the patient was done in Gynaecology and Obstetrics department (10,123 unit) followed by department of Medicine (3,581 unit) and PICU (3,048 unit). Figure 4 depicts the distribution of blood unit transfusion in various departments.



Department wise incidence of adverse transfusion reaction was seen maximally in department of Gynaecology and Obstetrics patients (29) followed by Orthopaedic (12) and Medicine (10).Categorization of TRs according to departments where the transfusion reaction occurred due to transfusion of blood unit has been depicted in Figure 5

FNHTRs: 32 out of 62 (51.6%) TRs were found to be FNHTRs. The most common signs and symptoms of these reactions were chills and rigors in 71.8% (n = 23) followed by fever in 43.7% (n = 14), myalgia in 9.3% (n = 3) and anxiety in 6.2% (n = 2).

Figure 5 : Department wise incidence of TR



Out of 27 allergic reactions, the common clinical signs and symptoms were rash in 81.4% (22 out of 27), pruritus in 40.7% (n = 11) and urticaria in 33.3% (n = 9). Allergic reaction was seen in 0.3% of total 7,836 units of WB and 0.019% of total 15,420 of Components (PRBC and FFP) transfused.

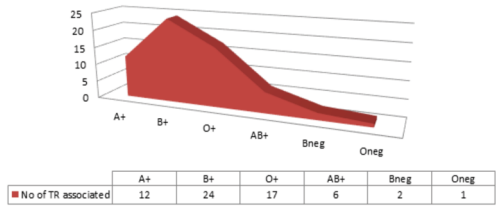
Acute non-immune hemolytic TRs (HTR): 1of 62 (1.6%) recipients had acute non immune haemolytic TR Clinical signs and symptoms as observed in this patient was hematuria and hemoglobinuria chill/rigors jaundice and fever . Intra operative passage of cola colour urine was observed after 100-150 ml transfusion, after which the transfusion was stopped and reported.

Delayed hemolytic transfusion reactions (DHTR): A single case of DHTR was reported in a female admitted gynecological ward. She was transfused with multiple units of FFP and PRBC both intra and post-operative for blood loss during surgery. She had a previous transfusion history, 6 weeks back for low hemoglobin outside the institute. On the 2nd day of the transfusion, the patient complained of flushing and sweating. She passed orange to red colored urine. Her post-transfusion serum unconjugated bilirubin was 11 mg/dl which rose to 16 mg/dl within 2 days. The patient's condition improved after 7 days and was discharged with no complications. Post-transfusion work up however did not point towards any mismatch error, DAT and IAT was negative on pre- and post-transfusion sample. The patient was lost to follow-up.

WBIT (Wrong Blood In Tube): 1 of 62 (1.6%) recipients had acute haemolytic TR due to wrong blood in tube in a 26 yr old female patient admitted in Gynae ward.Blood Group on sample found to be B+ in Blood bank. One (1) unit of B+ cross matched & issued. Transfusion started & during transfusion another sample received in Blood bank & Blood Group now found to be A+. Blood bank informed the duty doctor in the ward immediately & transfusion stopped (10-20 ml was transfused before transfusion stopped). Patient developed high grade fever (as per records). On further investigation it was found that B+ blood was transfused to A+ patient. Patient was discharged and lost to follow up.

Among the reported transfusion reaction 24 TR was reported with B+ (38.70%) ,17 O+ (27.41%), 12 A+ (19.35%),6 AB+ (9.67 %) blood groups respectively .Three (3) TR was reported with Rh negative blood group (2 with Bneg and 1 with Oneg). Figure 6 depicts the association of TR with blood group. This incidence of TR with blood group corresponds with the frequency of distribution of blood group prevalent in this region.[9]

Figure 6 : Transfusion Reaction associated with Blood Group



DISCUSSION

Transfusion reaction is defined as "any adverse event occurring as a result of blood transfusion for which no other cause is identifiable."

Transfusion reaction may be classified based on time of onset and mechanism of onset. TR is classified in the category mentioned in Table 6

	Acute onset (< 24 hr)	Delayed onset (within days or months)
IMMUNE MEDIATED	1.HEMOLYTIC(AHTR-Acute hemolytic TR) 2.FNHTR (Febrile non hemolytic transfusion reaction) 3.ALLERGIC (Due to PP in FFP mainly) 4.ANAPHYLACTIC 5.TRALI (Transfusion related acute lung injury) 6.TAD (Transfusion associated dysponea)	1.HEMOLYTIC (DHTR) 2.ALLOIMUNIZATION 3.PTP (Post transfusion perpura) 4.TA-GVHD (Transfusion associated graft versus host disease) 5.TRIM (Transfusion related immunomodulation)
NON IMMUNE MEDIATED	1.BACTERIAL SEPSIS 2.TACO (Transfusion associated circulatory overload) 3.HYPERKALEMIA 4.PHYSICAL & CHEMICAL DAMAGE TO RBC	1.TA –INFECTION • HEPATITIS B & C • HIV 1 & 2 • SYPHILIS • MALARIA 2.TA-IRON OVERLOAD

TR can be diagnosed based on the sign and symptoms reported during and after blood transfusion and laboratory test performed after the reaction.

The sign and symptoms that may be observed in different type of transfusion reactions are depicted in Table 7

Table 7

Reaction type	Common sign and symptoms						
	Cutaneous hives urticaria	Inflammatory fever, chills rigor	Pain	Respiratory	GIT nausea vomiting	hypotension	Hypertension
FNHTR	X	√	√	X	√	X	X
ALLERGIC	√	X	X	√	√	X	X
AHTR	X	√	√	√	√	√	**X**
TRALI	X	√	X	√	X	√	X
TACO	X	X	X	√	X	X	√
Anaphylactic	√	X	X	√	X	√	√
Bacterial Contamination	X	√	√	√	√	√	X
Hypotensive TR	√	X	X	√	√	√	X

In the present study, information about various adverse TRs was collected from the patients, reported to the blood bank. These were then evaluated on the basis of clinical history and laboratory work-up using a pre-defined protocol. In the present study, the frequency of TRs was found to be 0.266% (62 out of 23,256). In a similar study by Bhattacharya *et al*., incidence of adverse transfusion reaction was 0.18% (105 reactions out of 56,503 units of blood and blood component transfused).[10] However, the denominator used to calculate the frequency of TRs was not the actual number of recipients transfused mainly because some patients received multiple transfusions and a very small number of issued blood components could have been unused, not returned to the blood bank and discarded. Even the total number of adverse reactions may not be the actual indicator mainly because of under reporting. Under reporting of TRs has also been found by Narvios *et al*.[11] In other study conducted by Praveen et al incidence of adverse transfusion reaction was 0.05% (196 reactions out of 3,80,658 units of blood and blood component transfused). [12]In all the Hemolytic transfusion reactionss reported, hemolytic reaction was confirmed by hemoglobinuria, hematuria, rise of serum unconjugated bilirubin . All of these patients had received anti-human globulin negative (Gel method /Tube method) compatible blood components. Direct antibody test (Immunoglobulin G and C3d) was negative in all but one TR. These TRs were attributed to non-immune causes like thermal injury as a result of storage in the unmonitored domestic refrigerator in the ward or due to rapid transfusion through fine bored IV cannulas that was used to transfuse hypotonic intravenous fluids simultaneously. It has been observed that

PRBC with a hematocrit of 75-80%, when transfused forcibly through 21-22 G IV cannula may result in local hemolysis.[13] The frequency of acute hemolytic reactions observed in different studies ranges from 0.2 to 0.7 per 1,000 red cell units transfused.[14,15] In the present study, the frequency of acute HTR (non-immune) was found to be 0.06 per 1,000 blood component (1 out of 15,,420). The non-immune causes of hemolysis have emerged to be the foremost cause of HTRs in the present study. Improper storage conditions and inappropriate rate or method of transfusion leads to deterioration of blood components. Hence, it is prudent to educate the nursing staff and medical residents to reduce this risk.

Literature search revealed that the frequency of FNHTRs varies and are associated with platelets more than PRBC but in this present study it is seen more with PRBC than platelet.[16] Also with the use of leuko-reduced blood components the overall risk of FNHTR has reduced 0.12% in non-leuko-reduced to versus 0.08% in leuko-reduced blood components.[17] In our study, the frequency of FNHTRs has been found to be consistently higher than other type of reactions, it can be minimised through increasing awareness for transfusion of blood component (especially leucoreduced component) instead of whole blood and reporting about adverse reaction through hemovigilance system . There are a lot of variations in the frequency of FNHTRs among different studies throughout the world. This can be attributed to the variations in reporting system, frequent use of antipyretics and antihistaminic and pre-transfusion condition of the patient. In our study, the frequency of FNHTRs with the use of PRBC component is 0.05% (8 out of 15,420 PRBC and other component transfused), whole blood incriminated in 0.3% (24 out of 7,836 unit of whole blood transfused.) This higher rate in our study compared to the other studies, is mostly because of the use of single bag for whole blood and this can be minimised by using blood component quadruple bags and RBC filters. In our case, reaction from FFP was due to improper thawing in case of emergency and continuous pressure by the clinicians to issue FFP immediately. To reduce this risk, blood bank has devised a protocol to issue one FFP at a time and when the FFP has been partially transfused, then demand for the second unit of FFP is accepted and delivered. It is ensured that the FFP bags are thawed properly and have no visible floating flakes.

The overall incidence of allergic reactions has been found to be 0.03% (24 out of 7,836 unit of whole blood transfused and 2 cases from transfusion of FFP and 1 case from PRBC) in the present study. The blood component most commonly implicated in allergic reaction was Whole blood 0.03% (24 out of 7,836) followed by 2 FFP and 1 PRBC. These results are consistent with study by Domen *et al*. who reported allergic as 1 per 4124 (0.02%) [17] In a concise review done by Moore *et al*. at Mayo's clinic, the rate of mild allergic reactions was estimated to be 3%.[18] Incidence in other studies varies from 0.2 to 3%.[4] The definitions for allergic reaction have varied from presence of only hives or urticaria, to presence of wheezing and angioedema as well in some studies.[19,20] Our blood bank ensures single pricks during phlebotomy which reduces the allergic risk to the patient transfused.

TRALI is a rare, but important cause of transfusion-related mortality.[21] It is a great mimicker of a variety of clinical conditions and can be life threatening. Not a single case of TRALI was reported in our study [22] This absence of incidence of TRALI can be attributed to two factors, one careful selection of donors that we practice vigorously at our blood bank and secondly it may be due to under reporting by the clinicians. [23]

Not a single case of TACO was observed in our study. In a study by Popovsky *et al*., the incidence of circulatory overload was estimated to be 1 in 3,168 (0.03%) patients transfused with PRBC.[24] Rapid transfusion of blood components should be avoided and AABB recommends an infusion rate of 2-4 ml/minute for RBCs and 'faster' rates for plasma and FFP.[8] However, patients with severe anemia (Hb <4-5 g/dl) are at increased risk of TACO because of already being in a hyperkinetic state, with the heart being intolerant to even slight increase in blood volume.[25] The absence of TACO in our study may be due to under reporting by the clinicians.

Despite vigorous donor screening, bacterial contamination still remains an important cause of transfusion-related morbidity and mortality.[26] In various studies, incidence of bacterial contamination leading to TRs have been found to be 0.0002-0.003 for PRBC and 0.01-0.44 for platelets per 1,000 units of blood component transfused.[27] The sources of these bacteria are often from donor either from venepuncture site or breach in the aseptic technique during component preparation and storage. In our study, there were no infectious complications with blood transfusions. Strict aseptic measures are observed while collection as well as handling and storage in our blood bank. This is great achievement of our blood bank. The quality control is ensured by checking 1% of the collected PC by culture to ensure no bacterial contamination.

CONCLUSION

The frequency of TRs in our patients was found to be 0.266 % (62 out of 23,256) Of these, majority of the adverse reactions was observed 50 (80.6%) reactions occurred due to whole blood transfusion (7,836 unit) and 12 (19.4%) reaction occurred due to transfusion of blood component (15,420 unit of PRBC,FFP,PC).

Nearly 33.6 % (1 part) of blood transfusion (through whole blood) causes 80% of reactions and 66.3% (2 part) of blood transfusion (through blood component) causes 20% of reaction. Thus it is concluded from the study that with the use of blood component incidence of transfusion reaction decreases as compared to whole blood use.

Use of blood components instead of whole blood should be encouraged. The awareness amongst clinical counterpart will benefit in understanding the appropriate clinical use of blood and blood components. Proper filling of transfusion reaction forms with the necessary details, both positive and negative findings of reaction & investigation of transfusion reactions as per laid down procedures needs to be strictly adhered to. Resident doctors and nurses in the ward should also understand the importance of blood component use and must report all major and minor transfusion events to the transfusion service, especially at night and in a very busy set up. The hygiene of domestic refrigerator used to keep blood unit in various ward is also to be maintained.

Conflict of Interest: None.

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