TRANSFUSION REACTIONS: AFMC EXPERIENCE

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ABSTRACT

Transfusions of blood and its components are useful and lifesaving. Adverse effects occur during or after transfusion, called hazards or complications of blood transfusion. Complications/hazards of various types which occurred in the patients following transfusion of blood/blood components in Armed Forces Hospitals of Pune-Kirkee complex were analysed with relevant investigations. Out of a total number of 13,039 transfusions of blood and blood components from 01 June 1995 to 31 July 1997, there were 104 (0.8%) adverse reactions. Non haemolytic febrile transfusion reaction was the commonest seen in 73 (70.2%) transfusions, followed by allergic reactions in 19 (18.3%) cases. Nonspecific reactions were seen in 11 (10.6%). One haemolytic transfusion reaction occurred due to wrong labelling of blood sample received from the ward for compatibility testing. There were no fatalities.

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KEY WORDS: Blood transfusion; Complication; Febrile reaction.

Introduction

Since the first historical classic description of Haemolytic Transfusion Reaction (HTR) by Denis in 1668, the inherent dangers and reactions of transfusion of blood or its products are well known. Any untoward event occurring in a patient during or following the transfusion of whole blood or blood components is called complication or hazard of blood transfusion. Blood transfusion is usually a safe and effective form of therapy but there are inherent risks of adverse effects. In spite of precaution and preventive measures being taken adverse reactions continue to occur, which may be relatively mild or even fatal in some cases. The overall incidence of transfusion reactions is 5% [1].

Material and Methods

The present study was undertaken in the Department of Blood Transfusion and Immunohaematology, Armed Forces Medical College, Pune to analyse the incidence of transfusion reactions in order to take corrective measures to prevent and minimise reactions.

The duration of the study was from 01 June 1995 to 31 July 1997. Every unit of whole blood and blood products issued to various Armed Forces Hospitals in Pune-Kirkee complex was accompanied by an adverse reaction form mentioning all the details in case of reaction. All clinicians in dependent hospitals were asked to fill up the adverse reaction form giving relevant details regarding temperature, pulse, blood pressure both pre and post transfusion and any other symptoms and signs observed. The blood bag with residual blood, transfusion set with its cover, post transfusion blood and urine samples accompanied by completely filled up adverse reaction form were analysed with relevant investigations as per the laid down protocols and standard operating procedures (SOP) in the department. The investigations included a check for clerical errors, and tests for haemolysis in form of

plasma haemoglobin, examination of peripheral smear, pre and post transfusion ABO and Rh grouping, compatibility testing, antiglobulin test and urine for haemoglobin by the standard procedures [2]. Relevant biochemical investigations, microbiological investigations of aerobic and anaerobic culture, tests for pyrogen and toxicity wherever required were undertaken by the standard procedures [2].

Results

Out of a total number of 13,039 transfusions of blood and blood products from 01 June 1995 to 31 July 1997, there were 104 (0.8%) adverse reactions. Non haemolytic febrile transfusion reaction (NHFT) was the commonest complication seen in 73 (70.2%) transfusions. Allergic reactions were seen in 19 (18.3%) cases and nonspecific reactions were seen in 11 (10.6%). One haemolytic transfusion reaction occurred due to wrong labelling of blood sample received from the ward for compatibility testing. Table-1 shows the type of adverse reactions and number of blood units transfused. Adverse reactions to multiple transfusions were seen in 48 (64.6%) transfusions. Table-2 shows the age-wise distribution of adverse reactions. 37 (35.5%) adverse reactions were seen in the 31-40 years age group.

Table-3 shows the sex-wise distribution of adverse reactions. There were 64 (62.4%) females showing adverse reactions.

Discussion

Transfusions of blood and blood products are useful and life saving. However adverse effects do occur during or after transfusion of blood and blood products called as hazard or complications of blood transfusion [3]. Two types of reactions are seen, those which occur immediately or within 24 hours of the transfusion are called immediate and those which occur after about 48 hrs of transfusion are called delayed transfusion reactions. They are further subclassified into immunologic (due to antigen antibody mediated reactions) and non immunologic adverse reactions.

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TABLE 1
Types of adverse reaction and number of blood units transfused

Type of reaction	Total no.	Percentage	Number of units transfused			
			Single		Multiple	
			No.	%	No.	%
NHFTR	73	70.2	25	35.4	48	64.6
Allergic reaction	19	18.3	8	42.1	11	57.9
Non specific reaction	11	10.6	4	36.4	7	63.6
HTR	1	0.9	1	100	—	—
Total	104	100	38	36.5	66	63.5

TABLE 2
Agewise distribution of adverse reactions

Age in years	Total number	Percentage
1 - 10	2	1.9
11 - 20	1	0.9
21 - 30	17	16.4
31 - 40	37	35.5
41 - 50	19	18.5
51 - 60	20	19.2
61 - 70	6	5.7
71 - 80	2	1.9
Total	104	100

TABLE 3
Sexwise distribution of adverse reactions

Type	Male	Percentage	Female	Percentage
NHFTR [73]	27	37.1	46	62.9
Allergic reaction [19]	9	47.4	10	52.6
Non specific reaction [11]	4	36.4	7	63.6
HTR [1]	—	—	1	100
Total [104]	40		64	

The overall incidence of adverse reactions of transfusion of blood and blood products is 5% [1]. In the present study it is 0.8% which is due to proper monitoring of transfusion and stringent quality control and aseptic precautions being followed from the time the blood is collected to the time it is transfused to the patient. Non haemolytic febrile transfusion reaction (NHFTR) is the commonest amongst all complications seen in 50-70% of cases [1]. NHFTR is defined as a rise of at least 1 degree centigrade temperature during the transfusion of blood or blood components, within 1 to 2 hours following the transfusion [3]. It is most likely due to a reaction between leukocytes transfused with the blood products and antileukocyte antibodies [4]. The incidence in the present study is 70.2% which compares well with the other studies [1]. Transfusion of leucocyte poor blood products generally obviates

the occurrence of NHFTR [5].

Allergic reactions in the form of urticaria, erythematous wheals, itching etc. are generally due to antibody mediated response of patients to plasma proteins [6], but may be due to other substances in blood bags or components (such as ethylene oxide) [5]. The allergic reactions are second commonest seen in 30-40% of complications of blood transfusion [1]. In the present study the incidence was 18.3%. Nonspecific reactions in form of only a mild rigor without rise in temperature was seen in 10.6% of patients.

Haemolytic transfusion reaction (HTR) is defined as signs of red cell destruction due to incompatible transfusion or transfusion of blood haemolysed in vitro. A HTR may be immediate (IHTR) in which the destruction begins during transfusion and delayed (DHTR) in which destruction begins only after there has been an immune response provoked by transfusion. Haemolysis may be intravascular characterised by destruction of red cells within the blood stream which is brought about by antibodies (eg. anti A and anti B) which activate the whole of classical complement pathway, causing breaches in red cell membrane and liberation of haemoglobin into the plasma. Extravascular haemolysis is characterised by phagocytosis of damaged antibody coated red cells by macrophages of the mononuclear phagocyte system with subsequent liberation of bilirubin in to plasma [2]. The commonest cause is a clerical error seen in 1 in 6000 patients [7]. The clerical errors occur in the form of mislabelled samples from patient or donor, mislabelled blood bag or a misidentified patient [8]. In the present study one HTR occurred due to wrong labelling of blood sample received from the ward for compatibility testing. The HTR was mild as it was detected after transfusion of 10-15 ml of blood and was managed energetically. There were no fatalities due to complications of blood transfusion. Following the standard operating procedures, good manufacturing practice, strict aseptic precautions and stringent quality control can help in avoiding hazards of blood trans-

fusion some of which may even be fatal. Prevention is the key to handling these adverse reactions of blood transfusion.

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