BLOOD TRANSFUSION ADVERSE REACTIONS, INCIDENCE AND CAUSES- A RETROSPECTIVE STUDY OF 3 YEARS AT A TERTIARY CARE HOSPITAL IN HYDERABAD

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ABSTRACT

BACKGROUND

Blood transfusion is the transfusion of whole blood or blood components (packed cells or plasma only) into the blood stream or directly into the bone marrow.[1] It is carried out between individuals with compatible / identical blood groups, failure of which results in adverse transfusion reactions. An ATR (Adverse Transfusion Reaction) is an unfavourable reaction to the transfused blood/ blood component, the severity of which differs from person to person depending on the patient's susceptibility, degree of incompatibility and the type of reaction.[2]

MATERIALS AND METHODS

Transfusion reactions may be immediate or delayed type in onset. It can be immune or non-immune type depending on pathogenesis. The study was conducted at Gandhi Hospital blood bank which is a tertiary multispecialty hospital, for a period of three years from 2015 to 2018, with emphasis on incidence and manifestations of various transfusion reactions and associated morbidity. A total of 60,950 transfusion units were transfused during the period of August 2015 to August 2018, out of which 11 cases reported with ATR.

RESULTS

During the study, adverse transfusion reactions were recorded for 11 patients, with chills and rigors in 4 cases constituting 45.5% of the cases, shortness of breath was observed in 3 cases, accounting to 27.4%, fever was found in 2 cases with 18.1% and rash was observed in 2 cases with 9%.

CONCLUSION

Hemovigilance and practice of safe blood transfusion along with documentation and due prevention minimise the ATR's incidence considerably.

KEYWORDS

Acute Febrile Illness, Urticaria, Haemovigilance.

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BACKGROUND

Hemovigilance is a continuous process of data collection and analysis of Transfusion related adverse reactions, in order to investigate their causes and outcomes and to thereby prevent their recurrences.[3] The system includes monitoring, reporting, investigations and analysis of adverse reaction related to transfusion and manufacturing.[4] Hemovigilance is governed by National Institute of Biologicals, Ministry of Health and Family Welfare, Government of India.[5]

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Aims and Objectives

Adverse transfusion reactions were studies in detail during a period of 3 years from August 2015 up to August, 2018 in accordance with the Institute's protocol and SBTC guidelines. (State Blood Transfusion Committee)

MATERIALS AND METHODS

A prospective observational study was conducted at Gandhi Hospital blood bank for a period of three years from August 2015 to August 2018. Ethical Committee clearance was taken. All in patients who received blood transfusions, including the obstetricians, paediatricians, surgical, orthopaedic, neurosurgery and other specialities were included in the study. Patients with the past history of ATRs and those who were not willing to participate in the study were excluded. During the study, patient's data was collected from transfusion reaction forms, case sheets, personal interviews with patient/ attender and history of patient. The data of patient prior to transfusion were

documented in the documentation form. The suspected transfusion adverse reactions (fever, chills, hypotension, rigors, rashes and respiratory discomfort) were investigated. Based on the onset of the reaction, both immediate and delayed reactions were analysed.

In case of severe reactions, patient's blood samples were collected in EDTA vial and investigated for ABO, Rh grouping and typing, complete blood picture, direct antiglobulin test and antibody screening. These data were analysed and documented. The causality assessment of the ATRs was done by following the IPC-NIB prescribed causality scale.[5,6]

RESULTS

During the study period, a total of 60, 950 units were issued to 24,023 patients, out of which 30, 32 were whole blood, 14,308 were packed cells, 10,805 were fresh frozen plasma, 5,167 were random donor platelets and 264 were cryoprecipitate. Total number of 11 adverse reactions were reported. Among the 11 patients with ATRs, 8 were female and 3 were male patients.

10 were in the age group of 20-30 years and 1 was in the age group of 30-40 years age group. Among 60,950 blood units, 39,739 units of blood and blood components were transfused to female (65.2%) and 21,211(55%) units were transfused to male patients (34.8%). Among the female patients, 21,856 patients belonged to the obstetrics and gynaecology and the rest of them belonged to other specialities (17,883 – 45%).

Gender	No. of Units Transfused	Percentage (%)
Female	39739	65.2
Male	21211	34.8
Total	60950	100

Table 1. Gender Distribution based on the Number of Transfusions

Among the rest of the patients, transfused from different modalities, anaemia, viral fever, dengue positive cases with thrombocytopenia, blood loss due to surgery were the indications for transfusion.

Indication	Number of Units of Transfusion Issued	Percentage (%)
Delivery	33096	54.3
Anaemia	18651	30.6
Viral fever	4937	8.1
Dengue	2438	4
Surgery	1838	3
	60950	100

Table 2. Indications for Transfusion

Out of a total of 60,950 recipients of transfusion, 11 cases reported Adverse Transfusion Reactions, which consisted of itching with urticarial, fever, chills, rigors, and shortness of breath. Most common among the reactions was chills and rigors, followed by SOB, fever and rash.

Transfusion Reaction	No. of Cases Reported	Percentage
Chills & Rigors	5	45.5
Shortness of Breath	3	27.4.
Fever	2	18.1
Rash	1	9.0
Total	11	

Table 3. Types and Numbers of Adverse Transfusion Reactions

Definite	3- chills, 1- rash	4
Probable	3-SOB	3
Possible	1-fever	1
Unlikely	2-chills	2
Excluded	0	0

Table 4. Causality Assessment – IPC-NIB Scale

The major reason for transfusion was found to be for mothers during delivery accounting to 54.3%, followed by anaemia constituting 30.6% of transfusions, viral fever with thrombocytopenia accounted for 8.1% and dengue patients received 4% of all transfusions. Surgical patients received 3% of transfused blood and blood products.

During the study, adverse transfusion reactions were recorded for 11 patients, with chills and rigors in 4 cases constituting 45.5% of the cases, shortness of breath was observed in 3 cases, accounting to 27.4%, fever was found in 2 cases with 18.1% and rash was observed in 2 cases with 9%.

According to IPC-NIB scale, 4 cases of ATRs were definite (%), 3 cases were probable (%), 2 cases were possible (%) and 2 cases were unlikely (%). Majority of the cases of ATRs were attributed to whole blood transfusions (7 cases) and 4 cases for packed cells (%).

DISCUSSION

In our study, female patients required more transfusions than male patients. These findings correlated with the study done by Venkatachalapathy et al[7] and Vidhyashree et al[1].

Majority of the blood transfusion cases were for the patients in the age group of 20-30 years, among the male patients, the majority of the cases transfused belonged to 30-40 years age group and females were between 20-30 years of age.

Whole blood transfusions were more than packed cells, which coincided with the study done by Venkatachalapathy et al and differed from the study done by Vidyashree et al who found that packed cells were transfused more than whole blood.

The ATRs were categorised as Acute/ Immediate type and late onset type based on the onset of the reaction. Our observations showed that ATRs were found predominantly in females than in males. This was similar to the study conducted by Bhattacharya et al[8] and differed from study conducted by Praveen Kumar et al.[9]

Among the ATRs, allergic reactions with chills and rigors were predominant followed by shortness of breath, fever and rashes. These differed from the observations made by Bhattacharya et al[8] and Praveen Kumar et al.[9]

Majority of the ATRs occurred due to transfusions done by whole blood followed by packed cells which differed from findings of Praveen Kumar et al.[9] No reactions occurred in our study from RDP transfusions.

Causality assessment of transfusion adverse reactions were done using IPC-NIB prescribed scale. According to this scale, majority of the case were definite, followed by probable, possible and lastly unlikely. These findings differed from study done by Vidyashree et al.[1]

CONCLUSION

Most of the ATRs were observed in female patients in antenatal ward and mothers during delivery, followed by medical wards and most were due to whole blood transfusion followed by packed cells. We conclude that the ATRs need to be monitored carefully and due steps must be taken to treat them accordingly. Careful monitoring prevents most ATRs. Hemovigilance and practice of safe blood transfusion along with documentation and due prevention minimise the ATRs incidence considerably.

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