

Blood Transfusion Requests: An Audit in a Blood Transfusion Wing of a Referral Laboratory

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Abstract

Introduction: Transfusion of blood and its components such as Packed Red Cell (PRC), Platelet Rich Plasma (PRP) and Fresh Frozen Plasma (FFP) play an important role as a supportive therapy in patients admitted to a hospital.

Objective: To conduct an audit of blood transfusion requests regarding demographic data of the recipients, the component therapy, blood groups of the issued units, cross-match transfusion ratio, expiry of the transfusion units, pattern of blood components usage and transfusion reaction for which blood was returned back to blood bank.

Materials and Methods: This retrospective cross-sectional study was conducted at the transfusion wing of a referral laboratory over a period of three months from January 2013 to March 2013 upon 3015 episodes of transfusion units of whole blood and different blood components.

Results: Out of total 3015 episodes of transfusion unit in 1926 recipients, 930 were male and 996 female. About 41.0% requests of transfusion units received from the department of Obstetrics and Gynaecology (OBG) followed by the department of Surgery of about 28.7%. The most commonly used transfusion units was whole blood (55.3%) followed by platelet rich plasma (27.2%). Most of the recipients (62.3%) received single transfusion units and 37.7% recipients of ≥ 2 units. Out of 3769 cross-match, 3015 transfusion units were issued. In 12 (0.4%) cases, there were minor febrile and allergic reactions. During the study period, shelf life of six transfusion units had expired.

Conclusion: This study suggests that either systems audit or medical practice audit of blood and blood component orders can help to reduce the inappropriate

or indiscriminate transfusions and may be an important educational tool for the ordering physicians as well as for residents in training.

Key-words: Audit, Packed Red Cell (PRC), Platelet Rich Plasma (PRP), Fresh Frozen Plasma (FFP), Blood bank.

Introduction

In various discipline of medicine, blood transfusion therapy is an important and essential aspect of modern health care. Though it has many potential benefits, but it is expensive, especially certain blood components and is associated with a risk of developing mismatched blood transfusion reactions as well as the transmission of certain infections. Such transfusion associated risk can only be eliminated by intimate and close communication between the blood transfusion service centre and clinicians in managing the two important components of the transfusion process for which they are each responsible. These two components are: an adequate supply of safe blood and blood products by the blood transfusion service centre and the effective clinical use of blood and blood products by the clinicians^{1,2}.

The blood component implies separation of whole blood into various potential components like Packed Red Cells (PRC), Platelet Rich Plasma (PRP), Fresh Frozen Plasma (FFP), cryoprecipitate and leucocytes³⁻⁶. Blood and its components are an important part of patient management and have property to cause adverse reactions in the recipients. To obtain the maximum effects, safety and utility, clinicians and intravenous therapists should be aware of the potential risk of blood component therapy⁷. To assess and check the competency of a blood transfusion service centre as well as the pattern of blood utilization, it is essential

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essential to have regular audit of blood and its component usage⁸.

Systems audit and medical practice audit are most widely used in the hospital protocol in assessing the effectiveness of transfusion therapy¹. The systems audit is performed by the institution's blood transfusion service centre emphasizing the operational aspects of a service, measuring parameters such as rates of expiry of blood components, cross-matching to transfusion ratios and workload statistics⁹. Systems audit is an important part of the quality assurance programme which can provide necessary information for improving transfusion centre service³. Medical practice audits are usually performed to assess the appropriateness of transfusion practices⁹. In this article, a systems audit was undertaken in an institution's transfusion wing to address the various aspects of transfusion practices for whole blood, PRC, PRP and FFP.

Materials and Methods

This retrospective study was conducted in the transfusion wing of Armed Forces Institute of Pathology (AFIP) over a period of three months from January 2013 to March 2013. Analysis of requisitions for blood and its component against all patients from various departments of Combined Military Hospital (CMH), Dhaka Cantonment, Cantonment General Hospital and different private clinics and hospitals in Dhaka city were done. Certain epidemiological and demographical and blood groups of the recipients as well as the type of transfusion units requested for transfusion, nature of component and their quantity, number of units requested and the specialist/department prescribing it also studied.

Results

A total of 3015 episodes of transfusion units for different blood components issued to 1926 recipients were analyzed in this study. Out of 1926 recipients, male were 930 (48.3%) and female 996(51.7%). Fourteen hundred sixty four (76.0%) recipients were in the age group of more than 18 years (Table-I). During the study period a total of 3015 units of blood and blood components of various blood groups were issued to the recipients (Table-II). Against the total requisition of 1926, 3015 units of blood and its component were issued (Table-III). Blood and its

component were issued to the Department of Medicine, Surgery, Paediatric and Obstetrics and Gynaecology (OBG). Highest number of units were issued to the department of OBG (Table-IV). Requests for blood and its component were received from different departments. Maximum requests were obtained from the department of OBG (Table-V). Twelve hundred recipients (62.3%) received single transfusion units of blood or its component (Table-VI).

During the study period, a total of 3769 cross-match were done against a total issue of 3015 transfusion units. Transfusion units not taken by the requesting physicians were mainly from the department of OBG. The cross-matching to transfusion ratio in this study was found 1.25 (Table-VI). Trivial haemolytic transfusion reaction which includes febrile and allergic reaction was observed during the study period in 12 (0.4%) cases. The concerned department in such cases returned the transfusion unit to the blood bank. The blood bank repeated all the procedures under the supervision of transfusion specialist and no incompatibility was detected. These transfusion units were not reissued but discarded after observed proper standard procedure. Six transfusion units (0.2%) were expired their shelf life during this study. They were discarded properly.

Table-I: Distribution of recipients by age and sex (n=1926)

Sex		Age Group
Male	Female	≤1 year=162 (8.4%)
930 (48.3%)	996 (51.7%)	> 1year – 18 year= 300 (15.6%)
		>18 year = 1464 (76.0%)

Table-II: Distribution of blood groups among the recipients (n=3015)

Blood Group	Number	Percent
A +ve	995	33.0
B +ve	1066	35.4
O +ve	567	18.8
AB +ve	354	11.7
A –ve	15	0.50
B –ve	3	0.10
O – ve	15	0.50

Table-III: Distribution of blood and its components (n=3015)

Type of component	Number of Units	Percent
Whole blood	1667	55.3
Packed red cell	154	5.10
Platelet rich plasma	819	27.2
Fresh frozen plasma	375	12.4

Table-IV: Distribution of blood transfusion units (n=3015)

Department	Number	Percent
OBG	1235	41.0
Surgery	864	28.7
Medicine	393	13.0
Paediatric	523	17.3

Table-V: Distribution of blood and its component as per departments (n=3015)

Department	WB	PRC	PRP	FFP	Total
OBG	631	59	293	252	1235
Surgery	586	50	188	40	864
Medicine	272	22	99	00	393
Paediatric	178	23	239	83	523
Total	1667	154	819	375	3015

Table-VI: Distribution of transfusion units per recipients (n=1926)

Blood units	Number of recipients	Percent
Single unit	1200	62.30
≥Two units	726	37.70

Table-VII: Comparison of cross-match to issued transfusion units

Cross-match performed	No of transfusion units issued	Percentage of issue	Ratio between cross-match to transfusion units
3769	3015	80%	1.25

Discussion

The systems audit in blood transfusion centre was performed as part of ongoing institutional quality assurance programme that monitors the standard operating procedure of the centre such as the requisition order, type of blood and its component requested, cross-matching to transfusion ratio and workload statistics. Internal audits form an integral part of the quality control programme in any blood bank, like in any other organization^{10,11}.

In this study, among the recipients females were more than males. This correlates with other study conducted by Venkatachalapathy TS et al⁸ and Agrawal et al¹². Blood issued to the recipients in this study belongs to Blood group B positive in most of the cases (35.4%) followed by group A positive (33.0%). This blood group distribution slightly differs from other studies carried out by Venkatachalapathy TS et al⁸ and Agrawal et al¹². In a comparative study conducted by Sultana R et al¹⁴ revealed that blood group "B" is more frequent among the general people

of Dhaka city of Bangladesh followed by blood group "O". The blood group of the recipients in the present study was almost similar with the study of Sultana R et al. In the British Caucasian population, the highest frequency of ABO blood group is "O" followed by "A" but there is racial variation in this frequency¹⁵. In this present study, the difference with British Caucasian population in the frequency of blood groups among the recipients may be due to racial variation.

The component mostly issued to the recipients were the whole blood (55.3%) in this study followed by PRP (27.2%) and FFP (12.4%). PRC were issued in 154 (5.1%) cases. This finding also differs from that of Venkatachalapathy TS et al⁸, Barien WF⁹ and Agrawal et al¹². This may be due to wrong practice of using whole blood instead of PRC and overuse of PRP in mild to moderate degree of thrombocytopenia. Most of the requisitions for blood and its component received from the department of OBG (41.0%) and then by the department of surgery which also includes ENT, Eye, Orthopaedics, urology and neurosurgery which stands in the second position. This observation in the present study commensurate with Venkatachalapathy TS et al⁸, Barien WF⁹ and Agrawal et al¹² study. In the present study, multiple requests (≥2) for blood and its component for same recipients were 37.7% which is much higher than the finding carried out by Agrawal et al¹² where it was 11.2%. This large difference may be due to indiscriminate or inappropriate use of blood as well as relatively easy availability of blood bank services by our institute. In this study, the cross-match to transfusion ratio was 1.25. This slightly high performance of cross-match procedure against issuing of transfusion units may be due to adherence of more safe and anxiety free state both for the concerned physicians and patients.

Internal audit aims at proper selection of blood and its component for patients and to avoid their overuse^{13,16}. Blood and blood products are considered drugs by the Food and Drug Administration (FDA). Indiscriminate use of blood components is on a rise and it is important for the blood bank to be able to fulfill the demand for this life saving product and at the same time, evaluate and assess the existing trends of blood ordering. The supply of blood and blood components are limited but a high rate of inappropriate use has been reported around the world. These inappropriate uses of blood and blood components have a significant

impact on the patients and hospital state in the form of health care cost, wastage of resources, depriving more needy patients and transmission of infection and unnecessary allergic reaction leading to high mortality and morbidity in patients⁸.

Conclusion

To assess the blood and its various component utilization pattern, it is utmost important to carry out periodic review of blood component usage and judicious implementation of guidelines for use of various blood components may help to decrease their indiscriminate use. Strict adherence of such guidelines will ensure the blood requirements of needy patients and save many patients from transfusion related reactions. In Bangladesh, it has been becoming increasingly difficult to collect sufficient amount of blood from volunteer donors through such organization as Red Crescent, Shandani, Badhon, Quantum and so on to meet the ever increasing demand for blood derivatives. Hopefully education, audit and the establishment of hospital transfusion committee will definitely help us to curb misuse and realize that our current resources are sufficient to meet all justifiable demands.

Conflict of interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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