



Out of Core Hour Blood Transfusion - A Tertiary Care Hospital Experience

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ABSTRACT

Introduction

Blood transfusion is a complex process involving a lot of human factors that make the process vulnerable for errors to occur at any time. Any error in the transfusion process can lead to life threatening transfusion hazards. It is highly challenging for health care providers to provide optimal service during out of core hours with limited human resources. According to ideal transfusion guideline non-urgent transfusion should be avoided during out of core hours for the safety of the patient.

Objectives

1. To determine the out of core hour packed red blood cell transfusion practices in our health care facility.
2. To identify the avoidable out of core hour packed red blood cell transfusion.

Materials and Methods

A retrospective observational study was conducted in

the licensed blood centre of KIMS, Bengaluru for a period of 6 months from July 2022 to December 2022. The out of core hour time interval considered was between 8.00 PM to 8.00 AM.

Results

During the study period 452 patients were issued a total number of 520 units of PRBC. Male to Female ratio was 1:1.03. Predominant blood group of PRBC units issued was O positive 202(38.8%). Majority of PRBC units were issued between 8.00PM to 12.00 AM 292(56.15%). Most common indication for PRBC transfusion was Anaemia 345(66.34%).

Conclusion

Most common indication for out of core hour PRBC transfusion was anaemia for which transfusion can be done during regular working hours. Every hospital should establish a policy on out of core hour

transfusion laid down by the hospital transfusion committee to avoid non urgent transfusion during out of core hours unless it is clinically indicated so as to improve the safety of the patient.

Keywords

Blood transfusion; Out of core hour; Patient safety.

INTRODUCTION

Blood transfusion is a complex process starting from blood collection to transfusion of blood products to recipient involving a lot of human factors. It makes the process vulnerable for errors to occur at any time [1,2]. Any error in the transfusion process can lead to life threatening transfusion hazards. Thus, it becomes a challenge to give right blood to the right patient at the right time.

Serious hazards of transfusion (SHOT) report 2005 stated that 37% of transfusion errors occur during 'Out of core' hours [3,4]. Blood transfusion carries a significant number of inherent risks and less human resources are available in the laboratory and bedside during out of core hours. It is highly challenging for health care providers to provide optimal service during out of core hours with limited human resources. We perform our study to evaluate the out of core hour transfusion practices in our health care facility and to identify the avoidable late hour transfusion to ensure the safety of the patient.

MATERIALS AND METHODS

Retrospective observational study was conducted in the licensed Blood centre, KIMS, Bengaluru for a period of 6 months from July 2022 to December 2022. Institutional Ethical Committee clearance was obtained and the data required for the study was collected from departmental records. The number of PRBC units cross matched and issued in the blood

centre during "out of core hours" (8.00pm to 8.00am) were studied. The rationale for "out of core hours" transfusion was categorised into 3 groups based on clinical need as documented in the transfusion request form-

Group 1-Evident clinical need (urgent/emergency)-Patients with acute blood loss.

Group 2- Empirical (Transfusion dependant) -Patients on dialysis or sequence unit transfusion.

Group 3- Elective need (Chronic anaemia, preoperative/ procedural transfusion and others).

The proportion of avoidable transfusion in each category was noted based on British committee of standards for haematology (BCSH) guidelines on red cell transfusion [5].

RESULTS

During the study period 452 patients were issued a total number of 520 PRBCs during 8.00pm to 8.00 am. The ratio of male to female patients was 1:1.03 in which males accounted for 256(49.2%) and females for 264(50.76%).

Maximum number of patients transfused were in the age group of 41-60 years 172(33.07%) and least number were above 80 years 22(4.2%). Among 452 patients, 415 were given single unit of PRBC, 17 patients were issued 2 units, 11 patients were issued 3 units, 7 were issued 4 units and 2 patients were issued 5 units of PRBC.

Majority of PRBC were issued between 8.00PM to 12.00 AM 292(56.15%), followed by 4.01AM to 8.00AM 158(30.38%), 12.01 AM to 4.00AM 70(13.46%).

The indication for PRBC issue was documented- Anaemia 345(66.34%), followed by emergency surgical need 74(14.23%), chronic kidney disease &

dialysis 65(12.5%), active blood loss 27 (5.19%),infection7 (1.34%) and least common thalassemia 1(0.9%), chemotherapy 1(0.09%). Predominant blood group of PRBC issued was O positive202(38.8%) and least common blood group was AB negative 1(0.19%).

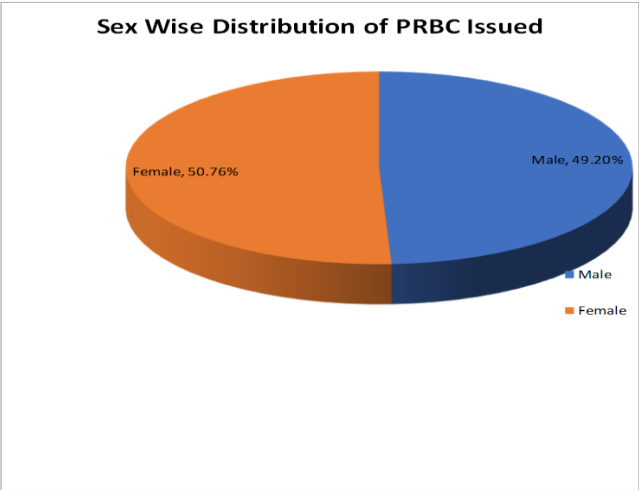


Fig. 1: Sex Wise Distribution of PRBC Issued

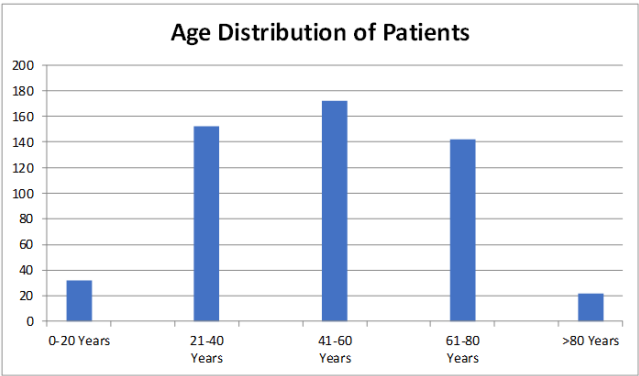


Fig. 2 : Age Distribution of patients

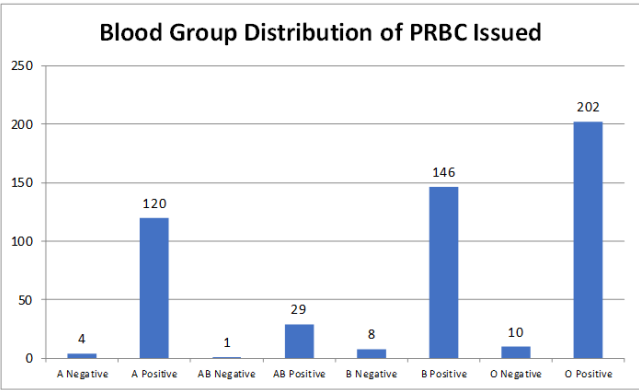


Fig. 3: Blood Group Distribution of PRBC Issued

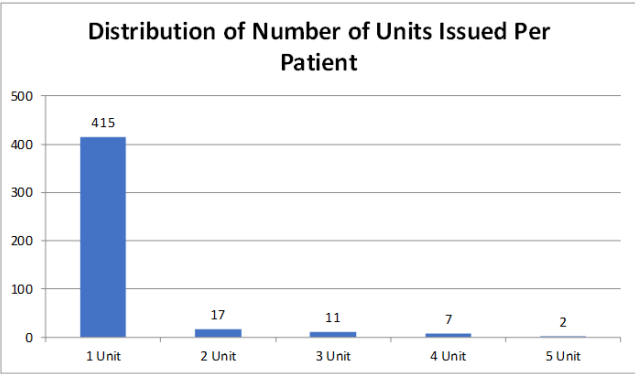


Fig. 4: Distribution of Number of Units Issued Per Patient

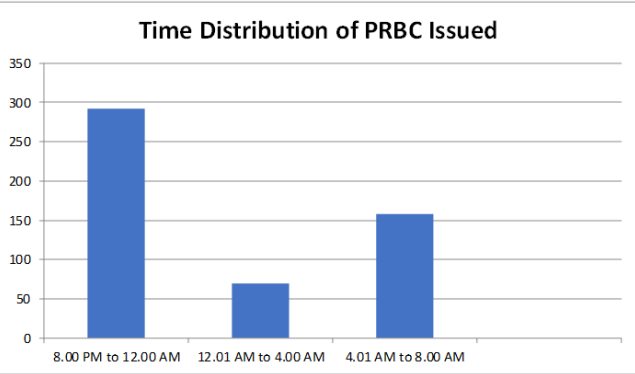


Fig. 5: Timing Distribution of PRBC Issued

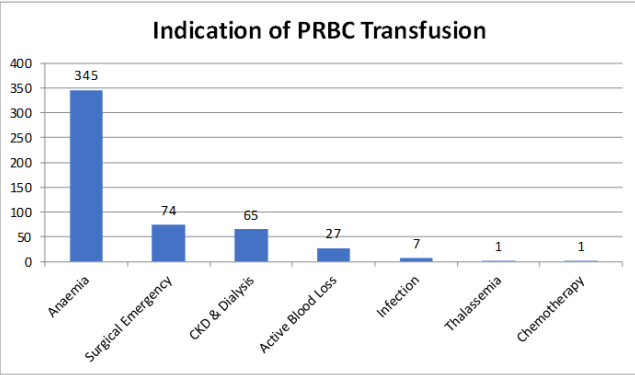


Fig. 6: Indication of PRBC Transfusion

DISCUSSION

Primum non nocere— ‘First do no harm’ is the fundamental pre-requisite of healthcare and in the blood transfusion process as well. As the blood transfusion is a complex process, it can lead to error at various critical points ^[1,2,6-8].

Data from recent decades shows that errors are the source of 87% of transfusion events and majority of these are laboratory errors (40%) which occurs during out of core hours due to human factors that may endanger the safety of the patient ^[4,6]. As per

guidelines any stable patient should not be given overnight transfusion unless it is clinically indicated.

In our study 520units of PRBC were issued to 452 patients constituting 23.59% of total transfusion and was found consistent with other international studies where the proportion of night transfusion varied from 12-29% ^[10-14]. Majority of patients were transfused with single unit of PRBC (415). Most of PRBC in the out of core hours were issued between 8.00 PM to 12.00 AM 292(56.15%) during which only one technical staff is on duty in the blood bank and he is involved in multiple tasks. Similarly nursing staffs also face the same challenges in administering and monitoring of blood transfusion at the bed side. Short staffing, long shifts and multitasking were identified as major risk factors for transfusion errors ^[15-17].

On categorization of the rationale for blood transfusion, anemia for which transfusion is elective need was found to be the most common indication for PRBC, was similar to the study conducted by Loong Ty et al ^[14], Kandaswamy D et al ^[18] and Donegan R et al. ^[9]

Patients with emergency surgical need and active blood loss need immediate transfusion whereas patients with chronic anaemia could be transfused during the subsequent day. Moreover, detailed clinical history should be taken into consideration to justify the rationale of PRBC transfusion during out of core hours for these patients.

Blood transfusion is a complex process and involves lots of human factors that makes the process vulnerable for errors to occur ^[11]. Any errors in the transfusion can be life threatening for the patient ^[6]. “Out of core hour” transfusion should be reduced in stable patients to overcome transfusion hazards and to

improve the safety of the patients. Proper communication between transfusion specialist and clinicians is very essential to overcome such transfusion hazards. Results from our study was discussed in the Hospital transfusion committee in our center and the members were enlightened regarding the safe transfusion protocol.

This is a single centre-based study and only represents the tip of the iceberg. Further studies in different centres will help to establish an in-depth review of out of core hour transfusion practices.

CONCLUSION

Most common indication for out of core hour PRBC transfusion in our study was anaemia for which transfusion could be done during regular working hours. Every hospital should establish a policy on after hour transfusions through Hospital Transfusion committee which recommends to avoid non urgent transfusions during afterhours unless it is clinically indicated. Less human resources are available both at blood centre and bedside during afterhours that makes the transfusion process vulnerable for errors to occur.

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