ORIGINAL ARTICLE

CLINICAL AUDIT OF BLOOD REQUISITION AND TRANSFUSION PRACTICES IN OB/GYN SURGERIES IN A SECONDARY CARE SETTING

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ABSTRACT

Objective: This study aimed at designing an audit tool for better understanding of pre-operative blood requisition and transfusion practice. These findings may help to provide evidence that an organization is working towards/meeting JCIA quality criteria of Cross match Transfusion ratio of 2:1.

Methods: Analysis of data over the first 3 months revealed over ordering of cross matched blood resulting in a high Cross match transfusion ratio. Some strategies were devised including: 1. Use of group and screen instead of routine cross matching.2.listing the major indications for cross matching of blood.3. Preoperative and antenatal anemia correction.4. All time availability of O negative blood. 4. Education of staff and doctors about these strategies.

Results: In the next 3 months the number of units cross matched fell moving towards a trend of group n save of blood samples resulting in significant improvement of CT Ratio.This helped us in efficient utilization of this limited resource.

Conclusion: Regular audits must be done in order to improve the blood ordering and utilization practice in every hospital setting.The audit tool developed for monitoring of Cross match transfusion ratio in Ob/Gyn surgeries and thereby strategies for improvement of this quality indicator was found very helpful.

KEYWORDS: Cross ratio (CT match Transfusion Ratio), Clinical audit, Blood Transfusion

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INTRODUCTION

Hemorrhage is still the leading cause of maternal and fetal morbidity and mortality in developing countries.[1]Despite all the advances in the prevention, diagnosis and treatment, massive blood loss during pregnancy and delivery remains a threat and there has been a trend towards increased arrangement of blood and blood products by surgeons and anaesthetists. In elective cases especially the possible need of blood products is based on the assumptions by surgeons and anaesthetists of the worst complications if they may arise. It has been reported that only 30% of cross matched blood is used in elective surgery.[2]

In obstetric practice, there are various causes of bleeding which can occur at any time during and after pregnancy. Disseminated intravascular coagulation (DIC) which causes profuse bleeding occurs in cases of retained products of conception, eclampsia, amniotic fluid embolism, postpartum hemorrhage and abortion. Many gynecological disorders like abnormal uterine bleeding, leiomyoma or cancers also lead to profuse bleeding and subsequent anemia, and hysterectomy is the most common surgery performed in these patients with a transfusion rate up to 8.6 %.[3]

A number of studies in many countries of the world have shown over ordering of blood by surgeons

with utilization ranging from 5 to 40%.4-8 In South Africa, for example, 7–10% of blood is wasted annually because of over ordering of blood.[5]Reports from India, Kuwait, and Nigeria also showed utilization rate of 28% [6], 13.6% [7], and and 69.7% [8], respectively.

Developing a blood ordering policy, to guide the clinicians regarding blood usage for surgical procedures, can decrease over ordering of blood thereby, reducing unnecessary compatibility testing, returning of unused blood, and wastage due to outdating. In addition, antibody screening of patient as part of pre-transfusion testing (T and S), defined protocols and policies for emergency transfusions and laying down guidelines/triggers for transfusion would lead to better utilization of blood and blood components.[12]

In our setting, it was identified that there was an increasing trend for cross matching of blood products for elective and emergency Ob/Gyn cases which resulted in a significant rise in cross match transfusion ratio which is JCIA (Joint Commission of International accreditation) quality indicator.

Hence our study aims to design an audit tool for better understanding of pre-operative blood requisition and transfusion practice in order to meet the desired Cross match transfusion ratios as per institutional guidelines and by devising new strategies. Additionally, our findings may help to provide evidence that an organization is working towards/-meeting JCIA quality criteria of Cross match Transfusion ratio of 2:1. Whereas the benefits of reducing the cross match transfusion ratios include reduced numbers of red cell units stored in the blood fridge, which may also reduce the risk of collecting the wrong blood products in error. It also helps in reduced workload for hospital staff that facilitates and document the movement of blood products into and out of the blood fridge via a blood register

METHODS

A clinical audit study was conducted between June to December 2016 in the Obstetrics and Gynecology Department of Agha Khan Hospital for Women Garden which is a secondary care facility. The study protocol was approved by the Research and Ethics Committee of the institution.

Medical records of patients who underwent Ob/Gyn surgical procedures including cesarean sections, hysterectomy, Dilation and evacuations, etc. during the study period were reviewed. Data was obtained on age, parity, booking status, type of any indication for caesarean section, blood loss at surgery and duration of hospital stay. Other information extracted includes pre and post-operative hemoglobin, units of blood reserved at the blood bank and units of blood actually transfused and returned to blood bank. Booked cases were considered as those who got registered and received antenatal care in the department of Obstetrics and Gynecology, while unbooked cases were those that were brought in as emergency from outside, even though they might have received antenatal care elsewhere.

Initial retrospective data for 3 months was evaluated and then strategies were devised in departmental audit meeting. Suggested strategies which were devised included the use of group and screen which will have a significant impact in reducing unnecessary blood ordering and use in obstetrics and gynaecology. Some of the indications for Cross match incaesarean sections may be:

1. Hemoglobin of less than 10g/dl
2. Presence of red cell antibodies
3. Antepartum Hemorrhage
4. Third or more cesarean section
5. Severe Preeclampsia or bleeding tendency
6. Failed Instrumental delivery

It was also suggested that Emergency O negative blood should be made available for unforeseen urgent situations. Risk factors like antenatal anemia should be investigated and treated appropriately as this may reduce the morbidity associated with blood transfusion and Postpartum Hemorrhage.Education of doctors and staff regarding indications of cross matching, difference between groups, and saving and cross matching of blood products.

A Follow-up analysis was then performed in the subsequent three months in order to assess the efficacy of devised strategies which were implemented and the results were then discussed in departmental forums.

Data obtained were analyzed with SPSS version XIV. Variables were summarized using frequency, percentages and ranges.

Table 1: Characteristics of study patients

Variables	**Ranges *(n=105)***
Age (Years)	14-60 years
Parity	0-7
Hospital Stay	0-6 days
Booking Status	%
Booked	92.4%
Unbooked	1.9%
Not avaliable	5.7%
Prognostic Variables	%
Preoperative Haemoglobin (gm/dl)	6.7-12.6
Postoperative Haemoglobin (gm/dl)	6.5-11.5
Estimated Blood loss (ml)	0-1200

Table 2: Indications for blood transfusion (n=105)

Variables	**Frequency**	**Percentage %**
1) Elective Cesarean Section	52	49.5%
2) Emergency Cesarean Section	25	23.8%
3) Primary Cesarean Section	1	1%
4) Hysterectomy	6	5.7%
5) Others	21	20%
Indications of Cesarean Section 1) Previous Scar	50	51.5%
2) Fetal Distress	8	8.2%
3) Breech Presentation	5	5.2%
4) Preeclampsia/Eclampsia	2	2.1%
5) Obstructed labour	1	1%
6) Abnormal CTG	2	2.1%
7) Multiple pregnancy	1	1%
8) Abruptio Placenta	2	2.1%
9) Malpresentation	2	2.1%
10) Others	24	24%

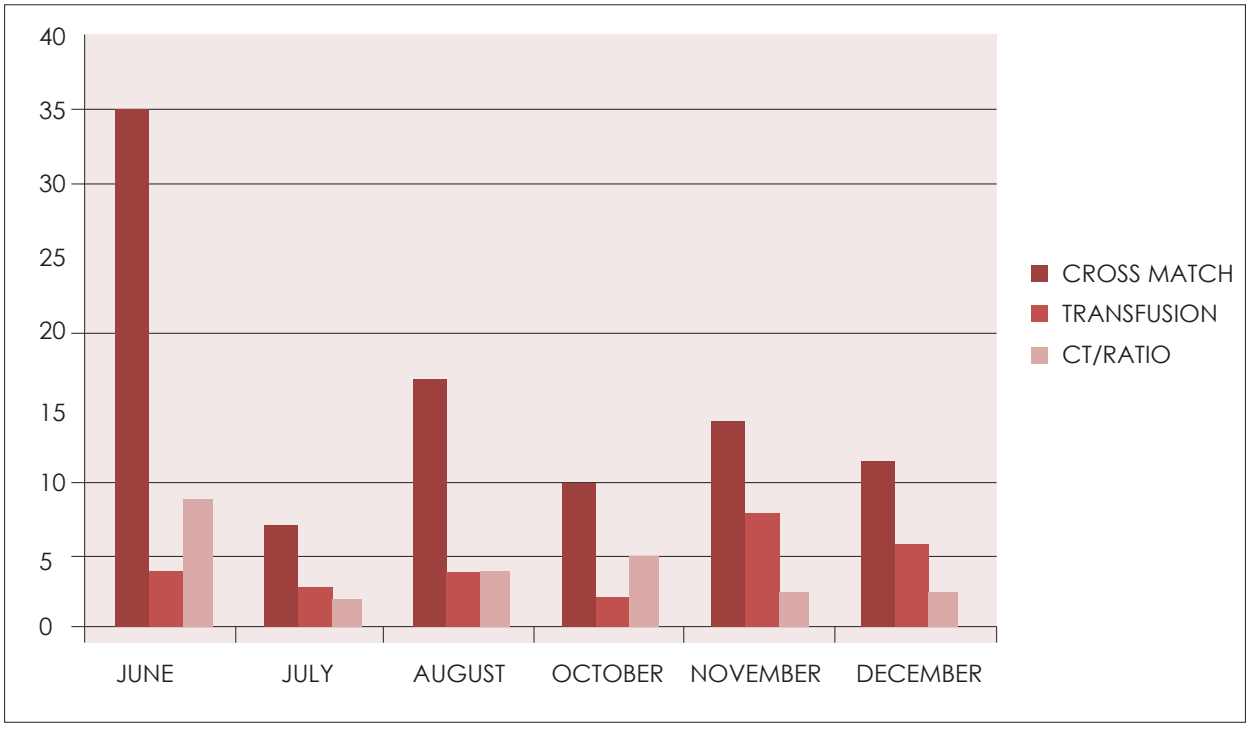

Figure 1: Cross Match Transfusion ratio trend over 6 months study period

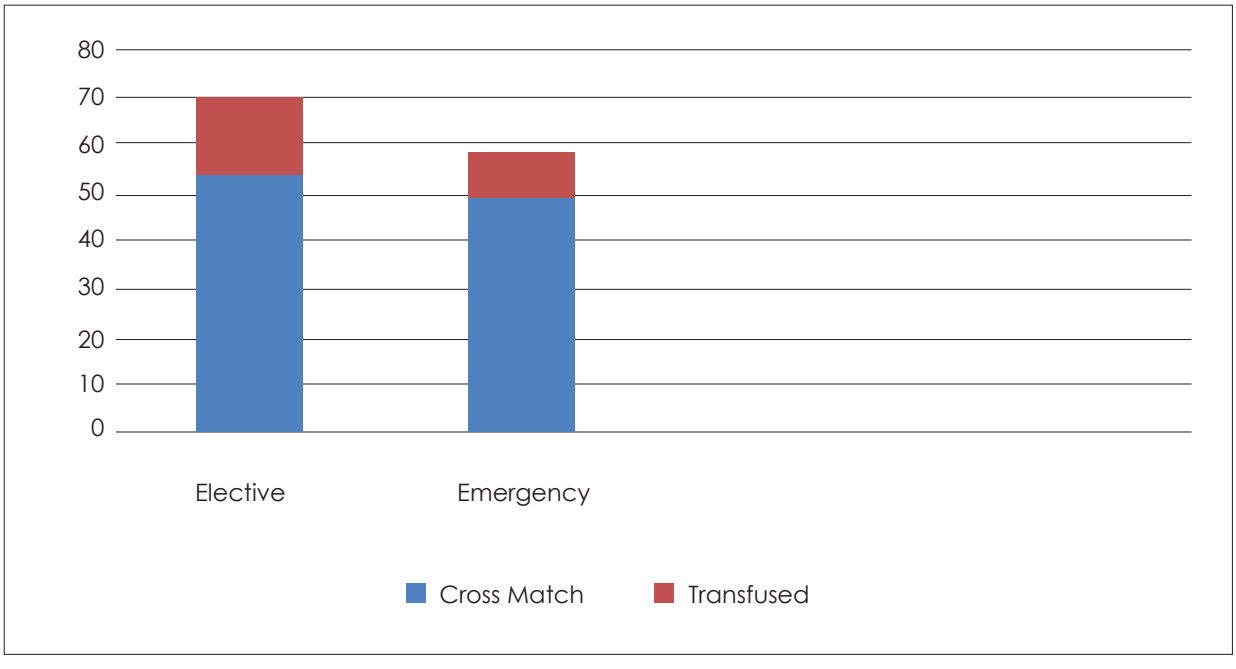

Figure 2: Comparison between number of units cross matched and transfused in operated patients

RESULTS

During the study period a total of 105 patients underwent major elective and emergency surgical procedures, including 59 elective and 46 emergency surgical procedures. Among these, 53 units of blood were cross matched in elective surgeries and 50 units were cross matched in emergency surgeries.

From a total of 103 units of blood cross matched, only 25 units were transfused i.e., 27%. This showed that about 69% of blood units were returned.Majority of the patients were booked (92.4%) between the age of 14 to 60 years. **(Table 1)**

The mean preoperative hemoglobin was found to be between 6.7 to 12.6 gm/dl and the mean postoperative haemoglobin fell from between 6.5 to 11.5 gm/dl **(Table 1)**.

The most common indication for which caesarean section was performed was in patients with history of previous caesarean. **(Table 2)**

DISCUSSION

The need for blood in hospitals continues to exceed the volume collected by the transfusion services. Since the introduction of blood transfusion into clinical practice, its appropriate use has been the subject of debate. It has been reported that only 30% of cross matched blood is used in elective surgery.[2,9]This leads to substantial costs and a burden to the transfusion services.The CT ratio is used[13] for evaluating blood transfusion practices. The overall CT ratio in a latest study in India of 6.31[14] was considered to be indicative of inefficient blood usage which was especially involving surgeries of the Department of Surgery and Gynaecology and Obstetrics.There is a paucity of evidence based information regarding arrangement of number of blood and blood products for both elective and emergency Ob/Gyn procedures. It is usually the surgeon's domain to order the blood products as per his/her assumptions of complexity of surgical procedure.

Worldwide strategies for monitoring utilization of ordered blood in hospital settings including Cross match transfusion ratio(CT Ratio), Transfusion Index(-TI), Maximum Surgical Blood Ordering Schedule(MS-BOS) has been shown to be cost effective and safe. Frequently, regular audits are required to ensure a balance of supply and demand based on institutional variation secondary to patient and surgeon differences.

There are 2 basic tests performed to type blood, namely the group and save (G and S) and the cross-match tests. The G and S test is a method to identify the blood by the ABO group system. The serum is saved so that further blood typing can be performed if necessary. It is easier and faster to perform than a cross-match test and does not remove blood from the common pool. Cross-matched means to fully type a sample and a unit of red cells to look for cross-reactivity. Blood is ready to use, but it is removed from the common pool. Pragmatic guidelines from the British Society of Haematology (BSH) are based on a cross-match-to-transfusion ratio (C:T) of 2:1, meaning that blood should not be available for surgery if the usage is below 50% of what was requested.[10]Our study helped in devising an audit tool and thus strategies based on the clinical audit for improving cross match transfusion ratio in our hospital setting.69% of the cross matchedblood in Ob/Gyn surgeries in our setting was unutilized before the strategies for improvement of Cross match transfusion ratio were implemented. This finding was almostcomparable to that reported in northern India study where59.0% of bloodcross matched was unutilized[11]

Implementation of these strategies followed by a prospective audit revealed a marked improvement in our hospital's dashboard quality indicator i.e. Cross match transfusion ratio as depicted in Figure 1, which was initially 8.75 and then dropped down to 1.8 after implementation of the devised strategies. The intervention to routine group-and-save blood pre-operatively was the principal factor responsible for the improved C:T ratio. With the cross-matching of blood from group-and-save serum taking only 20 min, there is no evidence to suggest that patients were at greater risk with the change in policy.

However it must be emphasized that patient safety is clearly paramount and there is a need for flexibility in these guidelines; clinical judgement is required in cases predicted to need higher blood volumes.

CONCLUSION

Blood transfusion is the cornerstone of resuscitation in Obstetric hemorrhage. The over ordering of blood and blood products is a dilemma and leads to burden for both patient and hospital resources. Regular audits must be done in order to improve the blood ordering and utilization practice in every hospital setting. Our study helped us in developing an audit tool for monitoring of Cross match transfusion ratio in Ob/Gyn surgeries and thereby strategies for improvement of this quality indicator were formulated.

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