

## Study of blood component therapy in a tertiary level care hospital in Ghaziabad

Manisha Gupta<sup>1\*</sup>, Neelima Agarwal<sup>2</sup>, Alpana Agrawal<sup>3</sup>, Akash Gupta<sup>4</sup>

<sup>1,2</sup>Professor, <sup>3</sup>Professor and HOD, <sup>4</sup>Post Graduate Resident, Dept. of Obstetrics and Gynecology, Santosh Medical College and Hospitals, Ghaziabad, Uttar Pradesh, India

**\*Corresponding Author: Manisha Gupta**

Email: manishagz@yahoo.com

### Abstract

**Introduction:** Pregnancy and labour present with many complications, which result in extra blood loss causing hemodynamic instability. This leads to a need of blood transfusion in the day-to-day practice of obstetrics. In a low resource country like India it becomes necessary to titrate the use of Blood components. With this in background we aim to study the usage of blood components in obstetrics in our hospital.

**Methodology:** It was an Observational cross sectional study. All obstetric patients who were transfused with blood components in the Department Of Obstetrics and Gynaecology in the hospital from January 2018 - September 2019 were recruited in the study. The indications, components transfused and indications of single unit transfusion were noted.

**Results:** Transfusion rate was found to be 3.1%. Anaemia and postpartum haemorrhage were the major causes for blood and blood product transfusion. Single unit transfusion was 55.1%. Anaemia in pregnancy was the major indication of single unit PRBC transfusion.

**Conclusion:** There must be a focus on reduction of unnecessary transfusions especially in conditions, which can be managed effectively by other means.

**Keywords:** Blood Transfusion in obstetrics, Single unit transfusion, Blood components, Active management of third stage of labour.

### Introduction

Obstetric haemorrhage is a major cause of maternal mortality in Low to Medium Income Countries (LMICs) accounting for about 25-30% maternal deaths.<sup>1</sup>

Cardiovascular adaptations during pregnancy enable the body to tolerate the blood loss during labour. Various pregnancy complications and disorders of labour present as risk factors for extra blood loss during pregnancy and cause severe hemodynamic instability. In LMICs due to high prevalence of underlying anaemia, blood loss is not tolerated well and Blood transfusion becomes life saving for the patient.

Apart from haemorrhage, other common causes requiring transfusion are anaemia, Pre-eclampsia Ruptured Ectopic, pregnancy and abortions.<sup>2,3</sup>

Over the years, there has been a tendency to reduce use of blood transfusion in obstetrics. The reason for this trend being risk of transfusion especially blood borne diseases and availability of better pharmacological, surgical and mechanical innovations to reduce blood loss. In a country like India, limited and fixed resources of blood, forces us to titrate the use of Blood and its components.

There are many controversies in the transfusion practices such as single-unit versus multiple-unit transfusions, whole blood versus component usage, clinical judgement versus "trigger" haemoglobin for transfusion and varying massive transfusion protocols.<sup>4-6</sup>

With this background this study was undertaken to analyse transfusion practices in Obstetrics in this institution.

### Methodology

An observational cross sectional study undertaken in the Department of Obstetrics and Gynaecology, Santosh Medical College and Hospital, Ghaziabad from January 2018 -September 2019. All patients admitted in the IPD in

Department of Obstetrics and Gynaecology, were recruited in the study and those who were transfused with Blood Components during the study period were studied.

The data was collected under the following headings

1. Socio demographic details- Age, parity, education, family structure, residence
2. Menstrual History
3. Obstetric details

### Present Pregnancy

Singleton/multiple pregnancy, Gestational age, antenatal /Intranatal /postnatal complications, Mode of Delivery.

### Previous Obstetric history

Singleton/multiple pregnancy, Gestational age, antenatal /Intranatal /postnatal complications, Mode of Delivery. History of excessive blood loss during delivery, History of blood transfusion

### Routine investigations

Complete Blood Count (CBC), Haemoglobin estimation before and after transfusion, Blood group, Platelet count, Bleeding time, clotting time, Prothrombin time and routine antenatal profile.

### Blood transfusion

The indications of blood transfusion, Number and type of unit transfused, Number of patients given blood components, Indications where single unit was transfused. The data was collected and tabulated. Proportions were calculated and Statistical analysis was done using chi square test and students T test where applicable.

**Results**

A total of 5295 admissions occurred in Indoor Patient Department (IPD) during the study period, of which total of 163 patients were transfused with 264 units of blood components during the period making the Transfusion rate 3.1%. There was no patient found who required massive blood transfusion during the study period.

The study group comprised of majority of primigravida with mean age group of 25.6 years with maximum transfusions in the age group 21-30years as shown in Tables 1 & 2.

**Table 1:** Sociodemographic factors (n=163)

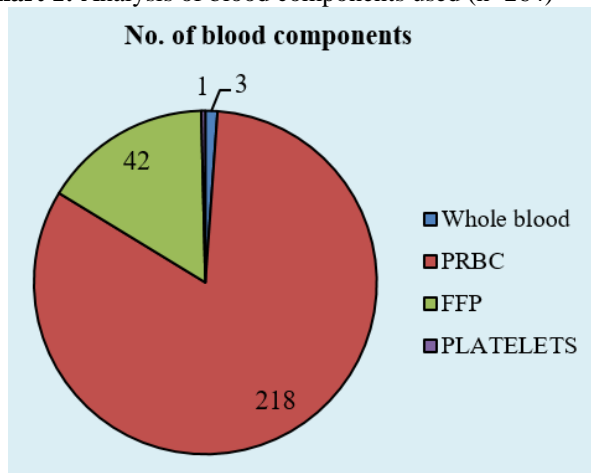
S. No.	Variables	Values
1	Age in years Mean ± SD	25.56±1.15
2	Gestational age in Weeks ± SD	36.23±2.1
3	Primipara N (%)	59
4	Multiple Pregnancy N (%)	10
5	Cesarean delivery N (%)	46

**Table 2**

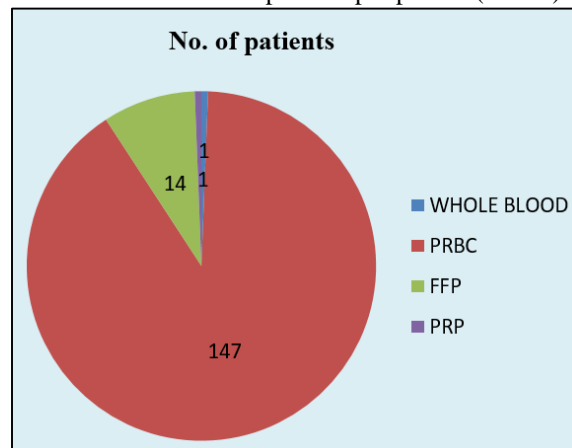
S. No.	Age Group	No. of Subjects	% Transfusion
1	≤ 20	10	6.1
2	21 - 30	96	58.9
3	≥ 31	57	35.0
<b>Total</b>		163	100.0

It was observed in this study that 82.4% patients were transfused with PRBC out of which 55.1% received single unit of PRBC. There was no cryoprecipitate transfusion as depicted in Chart 1 & 2.

**Chart 1:** Analysis of blood components used (n=264)

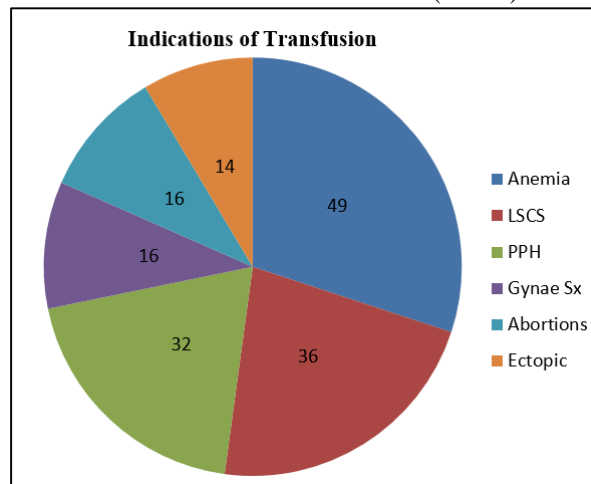


**Chart 2:** Use of blood components per patient (n=163)



In the present study, a total of 30% transfusions were done for patients found to be anaemic with haemoglobin less than 7 gm%, most of them who were unbooked cases and diagnosed as microcytic hypochromic anaemia on peripheral blood smear. Hemodynamic instability due to excessive blood loss following caesarean deliveries was the next common reason for the transfusion, Post partum Haemorrhage, one of the leading cause of maternal mortality and morbidity constituted about 20% of the transfusions (Chart 3).

**Chart 3:** Indications of blood transfusion (n=163)



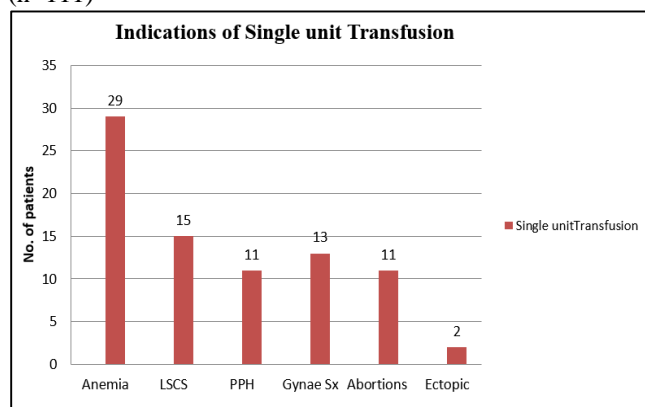
**Table 3:** No. of PRBC Units Transfused per patient (n=147)

S. No.	No. of Units	No. of Subjects	% Transfusion
1	1	81	55.1
2	2	42	28.5
3	≥ 3	24	16.3

In this study, 55.1% of transfused patients received single unit of PRBC. (Table 3). Anaemia was the leading indication followed by operative procedures like caesarean

section, Gynaecological surgeries and other pregnancy complications. (Chart 3)

**Chart 3:** Indications of Single unit PRBC Transfusion (n=111)



**Table 4:** Comparison of Hb% in pre and post single unit transfusion

Hb Level	Post Transfusion	Post Transfusion	P value
Mean Hb	7.4	7.5	= 0.6
Highest Hb	8.1	8.3	= 0.4
Lowest Hb	7.0	7.3	= 0.2

The mean pre-transfusion haemoglobin in single unit PRBC transfusion was 7.4 gm%. The average post transfusion haemoglobin was 7.5 gm%. The average gain in haemoglobin was 0.1 gm% which was not statistically significant.

**Table 5:** Comparison of Hb% in pre and post >1 unit transfusion

Hb Level	Pre Transfusion	Post Transfusion	P value
Mean Hb	6.4	7.5	<0.0001
Highest Hb	8.1	8.3	=0.2
Lowest Hb	4.3	6.2	<0.0001

In patients who were transfused more than 1 unit of PRBC had mean Hb% of 6.4g% and post transfusion Hb% of 7.5g% with gain of 1.1g% which was found to be statistically significant.

**Discussion**

Blood transfusion is an essential component of emergency obstetric care, hence appropriate and timely transfusion helps in reduction of maternal morbidity and mortality. Blood loss during pregnancy poses difficulty due to physiological changes of pregnancy. Many guidelines have been proposed for transfusion during pregnancy. The focus has now shifted to reduce the usage of blood transfusions and stress is now laid on using preventive measures to reduce blood loss.

The transfusion rate in the present study was found 3.1%, which is in accordance with the WHO guidelines which reports transfusion rate in obstetrics to be 2–6%.<sup>7</sup>

It was observed in the study that 82.4% patients were transfused with PRBC, whereas in studies by Pancholi and Bangal VB et al, 46.6% and 45.81% patients were transfused with packed cell volume transfusion respectively.<sup>7,8</sup> In another study by Chawla et al<sup>9</sup> it was observed that 79% patients were transfused with packed cell volume transfusion.

The major indication for transfusion in this study was anaemia followed by PPH. In a study done by Kamani et al, it was found that atonic PPH constituted the bulk of patients and in only 12% of patients transfusions were done because of anaemia. Similar to our study Pancholi, RK Singh et al and Chawla et al reported anaemia to be the leading indication for blood transfusion followed by haemorrhage.<sup>7,9,10</sup> Present study reveals that nutritional anaemia being quite rampant in this area forms the leading indication of blood transfusion. Hence there is a need for awareness and availability of pharmacological agents to combat anaemia. The other major cause is haemorrhage, which can be fought with better delivery facilities and Active Management of Third Stage of labour (AMTSL). Also, the over the counter (OTC) availability of MTP pills and its unsupervised administration is another contributing factor leading to increased blood loss after incomplete abortion.

Majority of present subjects underwent single unit transfusion (55.1%) which is in contrast to the study by N. Pancholi,<sup>7</sup> 18.57% of transfused patients received 1 unit; According to a study by Kamani AA, 5% of transfused patients received 1 unit; 52% of patients received 2 units.<sup>6</sup> The major indication of single unit transfusion was anaemia, which is similar to other studies. But in this study it was shown that single unit transfusion was not beneficial as the difference in the pre and post transfusion mean Hb% values did not show statistical significance. Probably clinically the patient seems to be anaemic than what is documented in the Hb% report and in surgical patients it improves the tissue oxygenation and promotes better healing and improves postoperative well being. On the contrary in subjects who were transfused more than one unit constituted mostly haemorrhagic anaemia and these patients responded better as compared to single unit transfusion. Hence, it can be said that single unit transfusion is avoidable in most cases but can be considered where clinically the patient looks anaemic and Hb% should not always be the deciding factor.<sup>10</sup>

Hence, the Ten Commandments for the transfusion practice in medicine state that transfusion should only be used when the benefits outweigh the risks and there are no other appropriate alternatives and laboratory tests should not always be the sole deciding factor for transfusion.<sup>11,12</sup> Blood transfusions are not always without risks so blood transfusion must be done only after due diligence to the situation and adhering to guidelines.

## Conclusion

Transfusion of blood and products should be undertaken only to treat a condition that would lead to significant morbidity or mortality and that cannot be prevented or managed effectively by other pharmacological or surgical means.

## Acknowledgements

Authors would like to thank the patients who agreed to participate in this study.

## Source of funding

No funding sources.

## Conflict of interest

None declared.

## References

1. The World Health Report 2005. Make every mother and Child count. Available at; <http://www.who.int/whr/2005/en>
2. Chhabra NS, Namgyal A. Rationale use of blood and its components in obstetric-gynecological practice. *J Mahatma Gandhi Inst Med Sci* 2014;19(2):93-9.
3. Carson JL, Carless PA, Hebert PC. Transfusion thresholds and other strategies for guiding allogeneic red blood cell transfusion. *Cochrane Database Syst Rev* 2010;10:CD002042.
4. Carson JL, Hill S, Carless P, et al. Transfusion triggers: a systematic review of the literature. *Transfus Med Rev* 2002;16(3):187-99.
5. Bonnar J. Massive obstetric hemorrhage. *Baillieres Best Pract Res Clin Obstet Gynaecol*. 2000;14:1-18.
6. Vachhani JH, Joshi JR, Bhanvadia VM. Rational use of blood: a study report on single unit transfusion. *Indian J Hematol Blood Transfus* 2008;24(2):69-71. doi: 10.1007/s12288-008-0032-9.
7. Kamani AA, McMorland GH, Wadsworth LD. Utilization of red blood cell transfusion in an obstetric setting. *Am J Obstet Gynecol* 1988;159(5):1177-81.
8. Pancholi N. Study of blood component therapy in obstetrics. *Int J Reprod Contracept Obstet Gynecol* 2019;8:2155-8.
9. Bangal VB, Gavhane SP, Aher KH, Bhavsar DK, Verma PR, Gagare SD. Pattern of utilization of blood and blood components in obstetrics at tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol* 2017;6:4671-6.
10. Chawla S, Bal MH, Vardhan BS, Jose CT, Sahoo I. Blood transfusion practices in obstetrics: our experience. *J Obstet Gynecol India* 2018;68(3):204-7.
11. Singh RK, Anne S, Ravindran SP. Changing trends of blood transfusion requirement in obstetrics and gynaecology. *Int J Reprod Contracept Obstet Gynecol* 2018;7:2018-22.
12. Derek N. Transfusion Ten commandments. In: Handbook of transfusion medicine. 5th ed. Norwich: TSO Publishers; 2013:1-3.
13. WHO. Clinical Transfusion Practice: Guidelines for Medical Interns, Available as [https://www.who.int/bloodsafety/transfusion\\_services/ClinicalTransfusionPracticeGuidelinesforMedicalInternsBangladesh.pdf](https://www.who.int/bloodsafety/transfusion_services/ClinicalTransfusionPracticeGuidelinesforMedicalInternsBangladesh.pdf)