



## Trend of blood component therapy among obstetric patients at a tertiary care centre

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### Abstract

**Background:** Pregnancy complications and management differ in various parts of the world because of differences in blood groups, genetic and environmentally acquired diseases, poverty, logistic and cultural factors. The various complications show up as conditions needing blood transfusion in the day to day practice of obstetrics. Blood is a scarce material. There is a need to evaluate the trend of blood component therapy in obstetric patients as they form major consumers of blood components. So, we undertook to study the trend of blood component therapy in obstetric patients.

**Methods:** The study was a prospective observational one conducted in a tertiary care centre for a period of six months in which all the blood requisitions that were sent for obstetric patients were analysed for the indication, type of components and the number of units transfused were recorded.

**Results:** During the study period 334 obstetric patients received 456 units of blood components. Among the blood components 419 were RBC units, 36 were FFP units and 1 was platelet concentrate. 253 units were single unit transfusions. There were 3 patients who received massive blood transfusion.

**Conclusion:** The percentage of single unit transfusion is high which is not to be encouraged. Standard massive transfusion protocol needs to be set to treat major obstetric haemorrhage more efficiently.

**Keywords:** *blood component, obstetric haemorrhage, massive transfusion*

### Introduction:

Pregnancy complications and management differ in various parts of the world because of differences in blood groups, genetic and environmentally acquired diseases, poverty, and logistic and cultural factors.<sup>[1]</sup> A few common risk factors lead to transfusion of blood and components during pregnancy and labor, and these factors include placental problems (previa, abruption, accreta, retained placenta), uterine overdistension (multiple gestation, polyhydramnios), pre eclampsia, DIC,

preterm labor and augmentation of labor and operative delivery-vaginal or abdominal.<sup>[2-4]</sup>

A worldwide survey shows huge variation of the lifetime risk of maternal mortality from bleeding, from one in six in the poorest countries to 1 in 30,000 in Northern European countries<sup>[5]</sup>. Obstetric hemorrhage and pre eclampsia together account for 50% of maternal deaths in poor as well as rich countries. The various complications show up as conditions needing blood transfusion in the day to day practice of obstetrics.

Blood is a scarce material. In recent years there is a trend towards a rational use of blood transfusion in clinical practice. In a resource poor country like India, there is a need to evaluate the trend of blood component therapy. Obstetric patients being major consumers of blood bank services, we have taken up this study to know the total no. of obstetric patients who needed blood component therapy, the indications, the blood components transfused and doses.

### Material and methods

This study was a prospective observational one conducted in the Department of Transfusion Medicine at a tertiary care centre, Imphal, Manipur. After taking approval from the Departmental Ethics Committee and written informed consent from the patients, all the blood requisition forms that were sent for obstetric patients were analysed for a period of six months, from February 2020 to July 2020. The demographic parameters such as name, age, sex along with diagnosis were recorded for each patient. Laboratory parameters, if available, were also recorded. Indication of transfusion, the type of blood component and the number of units transfused were noted for each patients, also single unit transfusions were sorted out. Patients receiving massive transfusion were analyzed with respect to the diagnosis and the blood components received.

### Results and observation

Altogether 334 obstetric patients required blood component transfusion during our study period. Majority of the patients were in the age group of 20-30 years with 181 patients. There were 117 patients in the age group of 31-40 years, 21 patients above the age of 40 and only 15 patients were below the age of 20.

**Table 1: Age wise distribution of obstetric patients needing blood transfusion**

AGE OF THE PATIENTS(YEARS)	NO. OF PATIENTS
<20	15
20-30	181
31-40	117
>40	21

TOTAL	334
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Maximum number of patients required blood transfusion to correct anaemia in the antenatal period. 185 patients were transfused with Packed Red Blood Cells (PRBC) to correct anaemia. Others required blood transfusion in the management of active bleeding. Out of these active bleeding cases, 53 were due to placenta praevia, 32 due to ectopic rupture, 22 due to post partum haemorrhage.

**Table 2: Indications of blood transfusion in obstetrics**

DIAGNOSIS	NO. OF PATIENTS
Anemia	185
Placenta praevia	53
Ectopic rupture	32
PPH	22
Others	42
TOTAL	334

During this study 419 PRBC units, 36 FFP units and 1 PC were transfused to obstetric patients. No cryoprecipitate was transfused to obstetric patients during this period.

**Table 3: Blood components transfused to obstetric patients**

COMPONENTS	NO. OF UNITS TRANSFUSED
PRBC	419
FFP	36
PC	1
CRYOPRECIPITATE	0

The pretransfusion Hb values recorded on the patient's requisition form were analysed. 68 patients had haemoglobin <7g/dl, 213 patients had haemoglobin in the range of 7-10 g/dl. 14 patients had haemoglobin more than 10g/dl but

were actively bleeding and so transfusions were started. 39 patients had no laboratory parameters available at the time of blood requisition. Clinical status seemed to be the deciding factor in this later group.

**Table 4: Haemoglobin levels of the obstetric patients needing blood transfusion**

FOR RBC Tx	No of patients
<7g/dl	68
7-10g/dl	213
>10g/dl	14
Parameters not given	39

There were 253 patients receiving single unit transfusions whereas 81 patients required multiunit transfusions. Only three patients needed massive transfusion, the first massive transfusion case was PPH in shock. She received 6 units of PRBC and 4 units of FFP in 3hours. The second one had intraoperative bleed. She received 6 units of PRBC, 2 units of FFP and 2units of platelet concentrate in 3 hours. The third patient also had intraoperative bleed and she received 5 units of PRBC, 1 unit of FFP and 1 unit of PC, the first four PRBCs were transfused within one one hour.

**Table 5: Patients requiring massive transfusion**

S l o	Diagnosis	No. of PRBC units transfused	No. of FFP units transfused	No. of PC units transfused	No. of cryoprecipitate transfused
1	Multigravida with PPH in shock	6	4	0	0
2	Post CS (three times) with intraoperative bleeding	6	2	2	0

3	Intraoperative bleeding with bladder injury	5	1	1	0
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**Discussion**

The different components of blood play different functions and component therapy is the need of the present day.<sup>[6]</sup> In our study there was not a single case of whole blood transfusion. This is an encouraging trend. Red cells are indicated for increasing red blood cells mass in symptomatic anemia who require increased oxygen carrying capacity. Each unit of transfused red cells prepared from 450 ml of whole blood is expected to increase haemoglobin by about 1g/dl(haematocrit 3%) in a patient of 70 kg body weight and who is not bleeding.<sup>[7]</sup> In our study majority of the patients presented with Hb in the range 7-10g/dl. Anaemia in pregnancy is the major indication of blood transfusion in our study.

FFP contains all the coagulation factors including the labile factors V and VIII ,if stored at -30 C. A usual dose of plasma is 10-20 ml/kg.This dose is expected to increase the level of coagulation factors by 20% immediately after infusion.<sup>[8]</sup>

Expert opinion recommends a platelet transfusion threshold of 50,000/ul in most patients with active bleeding.<sup>[9]</sup>

Single unit transfusion needs special mention because it is avoidable in majority of the cases. Vachhani et al in their study discouraged practice of single unit transfusion.<sup>[10]</sup> Gupte and Shaw have observed maximum use (62.2%)of single unit transfusions in urological surgeries and minimum (25.8%)in cancer surgeries performed on adult patients.<sup>[11]</sup> Gupte et al found decreasing rate of single unit transfusion in their 8 years study<sup>[12]</sup> They found a decline from 21.8% to 13.8% in obstetrical and gynaecological surgeries.

WHO strongly discourages single unit transfusion. WHO advocates that the need of transfusion can be avoided by prevention or early diagnosis and treatment of anemia, correction of anemia and replacement of depleted iron stores before planned

surgery and use of simple alternatives to transfusion like intravenous replacement fluids, good anaesthetic and surgical management.<sup>[13]</sup> Blood should not be given for volume expansion, as haematinic/tonic, to enhance wound healing or to improve general well being. If given when it is not needed, the patient receives no benefit and is exposed to unnecessary risk.

Over the years, there has been a tendency to reduce use of blood transfusion in obstetrics. This decline in transfusion has occurred despite the rise in operative delivery rate at various centres. Despite the decrease in rates of blood transfusion the obstetric outcome has improved.<sup>[14,15,16]</sup>

Blood transfusion is not without risks. In case of single unit transfusion the benefit of blood transfusion doesn't seem to outweigh the risks. In our study, out of the total 419 PRBC transfusion 253 were single unit transfusions which is 60.38 %. This figure is alarmingly high. This issue can be addressed in future Continuing Medical Education.

In our study there were three patients who required massive transfusion. Massive transfusion may be defined as one blood volume replacement in 24 hours or replacement of 50% of total blood volume in 3 hours. An infusion of greater than 4 units of RBCs in an hour and ongoing use anticipated could also be regarded as a massive transfusion.<sup>[17]</sup>

In case of uncontrollable excessive bleeding, prompt transfusions with an optimal ratio of RBC, plasma, platelets, tranexamic acid, and fibrinogen should be considered because it has been shown that hypofibrinogenemia develops early during major obstetric hemorrhage. This has been shown to reduce total blood use and mortality in trauma.<sup>[18-22]</sup>

Fibrinogen is one of the earliest coagulation proteins to fall in major bleeding and when levels fall, patients have a reduced ability to form clots and may bleed for longer periods.<sup>[23,24]</sup> An adult dose of around 10 single donor units of cryoprecipitate typically raises the plasma fibrinogen level by up to 1g/L.<sup>[25]</sup> In our study, cryoprecipitate was not requested. So, none of the patients, including the massively bleeding ones, received cryoprecipitate transfusion.

We sincerely feel the need of setting massive transfusion protocols (MTPs) for our centre. MTPs will describe the process of management of blood

transfusion requirements in major bleeding episodes, assisting the interactions of the treating clinicians and the blood bank and ensuring judicious use of blood and blood components.

## Conclusion

Total no. of 334 patients received blood transfusions in the form of PRBC, FFP and PC. There is not a single transfusion of whole blood which is an encouraging trend. Anaemia in pregnancy is the most common indication of blood transfusion in our study. If the problem of low Hb level in the reproductive age group is properly handled then the number of transfusion of PRBC can be reduced. The percentage of single unit transfusion is alarmingly high (60.38%). This issue needs to be addressed in future training programmes or CMEs. There is a need to form massive transfusion protocols to handle massive obstetrical haemorrhage more efficiently. This needs coordination between the treating surgeons and the blood bank.

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