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Original Research Article

## Study of blood component therapy in obstetrics

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### ABSTRACT

**Background:** Blood transfusion is a life saving measure. Various pregnancy complications and disorders of labor present as risk factors for extra blood loss during pregnancy and cause severe hemodynamic instability. This along with complications due to abortion (spontaneous or induced) and ruptured ectopic pregnancy show up as conditions needing transfusion in the day-to-day practice of obstetrics. In a country like India, limited and fixed resources of blood, forces us to titrate the use of blood and its components. Normally, blood loss during birth is well-tolerated because of changes during pregnancy.

**Methods:** This is a retrospective observational study done at tertiary care hospital. This study is based on study of indoor patients admitted during one year duration. Detailed history and all necessary investigations were carried out. Details regarding blood transfusion were taken indication of blood transfusion, number and type of unit transfused, number of patients given blood components, indications where single unit was transfused. Analysis of the data was done.

**Results:** Anemia followed by antepartum hemorrhage followed by postpartum hemorrhage was the major cause for blood and blood product transfusion. Approximately 60% patients required two units of PCV (Packed Cell Volume) transfusion. Anemia in pregnancy was the major cause of single unit PCV transfusion.

**Conclusions:** A proper knowledge for blood and blood product transfusion is needed to make it available for people who are actually in need and also to decrease the economic burden. Measures to prevent anemia should be implemented. Active management of third stage of labour (AMTSL) should be done to avoid postpartum hemorrhage. Single unit transfusion should be avoided.

**Keywords:** Active management of third stage of labour, Cryoprecipitate, Massive transfusion, Packed cell volume, Single unit transfusion

### INTRODUCTION

Blood transfusion is a life saving measure. Normally, blood loss during birth is well-tolerated because of changes during pregnancy. In general, <15% loss results in minimal symptoms; 15-30% causes tachycardia; 30-40% shock; >40% loss leads to severe shock. With underlying diseases, even with <30-40% loss, blood is required.<sup>1</sup> The risk of mortality increases significantly in otherwise stable patients when the hemoglobin (Hb) falls to 3.5-4g/dL, but in cases with ischemic heart disease

with 7 g/dL.<sup>2</sup> So, obstetric hemorrhage is a major cause of perinatal and maternal mortality, about 25-30% maternal deaths due to hemorrhage.<sup>3</sup> Various pregnancy complications and disorders of labor present as risk factors for extra blood loss during pregnancy and cause severe hemodynamic instability. This along with complications due to abortion (spontaneous or induced) and ruptured ectopic pregnancy show up as conditions needing transfusion in the day-to-day practice of obstetrics.<sup>4</sup> Over the last 30 years there has been a general trend towards a reduced use of blood transfusion in

obstetric and gynecological practice. The reason for this trend being risk of transfusion especially blood borne diseases and better pharmacological, surgical and mechanical innovations to reduce blood loss and iron supplementation for high risk people. In a country like India, limited and fixed resources of blood, forces us to titrate the use of blood and its components.

## METHODS

This study was conducted to know the various indications of blood transfusion (blood and blood products) in department of obstetrics. This study is a retrospective observational study done on patients who were admitted in obstetric department for the duration of one year from February 2012 to January 2013 in a tertiary care institute. Numbers of transfusions were noted out of all indoor patients irrespective of the department of our hospital. There were 3000 indoor obstetric patients.

### Inclusion criteria

- Patients diagnosed with moderate to severe anemia with clinical indication of blood transfusion
- Patient diagnosed with hemorrhage in early pregnancy with clinical indication of blood transfusion
- Patient diagnosed with antepartum hemorrhage with clinical indication of blood transfusion
- Patient diagnosed with intrapartum hemorrhage with clinical indication of blood transfusion
- Patient diagnosed with postpartum hemorrhage with clinical indication of blood transfusion.

### Exclusion criteria

- Patient with mild anemia
- Patient diagnosed with hemorrhage in early pregnancy without clinical indication of blood transfusion
- Patient diagnosed with antepartum hemorrhage without clinical indication of blood transfusion
- Patient diagnosed with intrapartum hemorrhage without clinical indication of blood transfusion
- Patient diagnosed with postpartum hemorrhage without clinical indication of blood transfusion.

Of these 140 patients were given blood transfusion. A detailed history of socio-economic class, obstetric history, menstrual history and number of antenatal visits was taken and thorough clinical examination was done. On admission, routine investigations like hemoglobin, blood group, platelet count, bleeding time, clotting time, prothrombin time, S. Fibrinogen, D-Dimer as well as ultrasound was done. The indications of blood transfusion were studied in detail and decided whether it was actually needed or can be avoided. Details about blood transfusion like.

- The indication of blood transfusion

- Number and type of unit transfused
- Number of patients given blood components
- Indications where single unit was transfused.

## RESULTS

In our study the indications were pregnancy with anemia 28.57%; antepartum hemorrhage (abruptio placentae/placenta previa) 23.57%; postpartum hemorrhage 21.42%; ectopic pregnancy 10.0%; abortion 10.0%; LSCS and Instrumental delivery 6.42%.

**Table 1: Indications of blood transfusion in obstetrics.**

Indications for blood transfusion	No. of patients	Percentage
Pregnancy with anemia	40	28.57
Antepartum hemorrhage (Abruptio placentae/ placenta previa)	33	23.57
Postpartum hemorrhage	30	21.42
Abortion	14	10.0
Ectopic pregnancy	14	10.0
LSCS and instrumental delivery	9	6.42

In this study 18.57% of transfused patients received 1 unit; 42.85% of patients received 2 units, 12.85% received 3 units and 12.14% received 4 units; 13.57% received greater than or equal to 5 units of packed red blood cells.

**Table 2: No. of units of PCV transfused per patient.**

No. of units	No. of patients	Percentage
Single	26	18.57
2	60	42.85
3	18	12.85
4	17	12.14
5 or more	19	13.57

**Table 3: Analysis of single unit transfusion.**

Indication	No. of patients	Percentage
Pregnancy with anemia	16	61.53
LSCS or instrumental delivery	5	19.23
Abruptio placentae	-	-
Ectopic pregnancy	-	-
Placenta previa	-	-
Abortion	4	15.38
Postpartum hemorrhage	1	3.84
<b>Total</b>	<b>26</b>	

The indications for single unit transfusion were pregnancy with anemia (61.53%), LSCS or instrumental

delivery (19.24%), abortion (15.38%), postpartum hemorrhage (3.84%).

**Table 4: Use of different components.**

Type of blood component	No. of units	Percentage
PCV	279	46.6
FFP	128	21.4
PRC	142	23.7
Cryoprecipitate	49	8.1

It was observed in our study that 21.4% patients were transfused with fresh frozen plasma, 46.6% patients were transfused with packed cell volume transfusion, and 23.7% patients were transfused with platelet transfusion and cryoprecipitate transfusion (8.1%).

## DISCUSSION

Preeclampsia In our study (Table 1) the indications were pregnancy with anemia 28.57%; antepartum hemorrhage (abruptio placentae/ placenta previa) 23.57%; postpartum hemorrhage 21.42%; ectopic pregnancy 10.0%; abortion 10.0%; operative delivery 6.42%. Major indications for transfusion in a retrospective review of 7731 mothers by Kamani et al, found were uterine atony, 27%; retained placenta, 17%; trauma, 17%, placenta previa, 7%; and abruptio placentae, 5%. In 12% of patients transfusions were done because of anemia. 5 Measures to prevent anemia must be promoted. Active management of third stage of labor can prevent the number of anticipated blood transfusion.<sup>6,7</sup>

In this study (Table 2), 18.57% of transfused patients received 1 unit; 42.85% of patients received 2 units, 12.85% received 3 units and 12.14% received 4 units; 13.57% received greater than or equal to 5 units of packed red blood cells. According to a study by Kamani AA, 5% of transfused patients received 1 unit; 52% of patients received 2 units, 19% received 3 units and 24% received greater than or equal to 4 units of packed red blood cells.<sup>5</sup>

The indications for single unit transfusion (Table 3) were pregnancy with anemia (61.53%), LSCS or instrumental delivery (19.24%), abortion (15.38%), postpartum hemorrhage (3.84%). Currently there are 30 major blood group systems and more than 308 red cell antigens.<sup>8</sup> However, during pre-transfusion testing blood bank tests for only ABO and Rh (D) antigens, thus transfusion poses a risk of alloimmunization to other blood group antigens. There are also several other risks like transmission of infections, different types of transfusion reactions etc.<sup>9</sup> Therefore clinicians must prevent single unit transfusion in adult patients which can raise Hb only by 1-1.5g/dL.<sup>10</sup> WHO strongly discourages single unit transfusion.<sup>11</sup> The practice of single unit transfusion is largely avoidable.<sup>12</sup>

It was observed in our study (Table 4) that 21.4% patients were transfused with fresh frozen plasma, 46.6% patients were transfused with packed cell volume transfusion, 23.7% patients were transfused with platelet transfusion and cryoprecipitate transfusion (8.1%). It was observed in a study by Bangal VB et al, that 46.62% patients were transfused with fresh frozen plasma, 45.81% patients were transfused with packed cell volume transfusion, 4.02% patients were transfused with platelet transfusion and cryoprecipitate transfusion (0.33%).<sup>13</sup> In another study by Chawla et al, it was observed that 66% patients were transfused with fresh frozen plasma, 79% patients were transfused with packed cell volume transfusion, 15% patients were transfused with platelet transfusion.<sup>4</sup> 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 appropriate alternatives, and laboratory tests should not be the sole deciding factor for transfusion.<sup>14</sup> The guidelines for blood transfusion to obstetrics (Ob)/gynecology (Gy) patients are available.<sup>11,15</sup> Blood transfusion may be a lifesaving procedure but it is not without risk. Recipients may rarely develop transfusion-transmitted infections or suffer immunological sequelae such as red cell alloimmunisation. The major risk is of a patient receiving incorrect blood component. Hence blood transfusion must be done only after due diligence to the situation and adhering to guidelines. All possible policies should be looked into for preventing blood transfusion in patients to reduce the risk of transfusion. Promoting component therapy not only brings down the requirement of Whole Blood, but also ensures optimum use of blood.

## CONCLUSION

Incidence of blood transfusion in obstetric patients is high. Obstetric patients are major consumer of blood bank services.

A proper knowledge for blood and blood product transfusion is needed to make it available for people who are actually in need and also to decrease the economic burden. The appropriateness of utilization of blood and blood products lies with the physicians' compliance with blood transfusion guidelines. Anemia followed by obstetric hemorrhage still persists to be a major cause for blood and blood product transfusion. Measures to prevent anemia should be implemented. Obstetric hemorrhage is an emergency situation and cannot always be avoided or prevented. AMTSL should be done to avoid postpartum hemorrhage. Single unit transfusion should be avoided.

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