



## A DESCRIPTIVE ONE YEAR STUDY ON OBSTETRIC RBC TRANSFUSION PRACTICE FROM A TERTIARY CARE CENTRE

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**ABSTRACT** **Background** There has been a trend towards a reduced use of blood transfusion in obstetric practice. Obstetric hemorrhage is often sudden, unexpected and encompasses antepartum, intra-partum, and postpartum bleeding. A prospective one-year single-centre audit of obstetric red cell transfusions was conducted. **Methods** Data collection pro forma was used to collect information from maternity case notes on demographics, transfusion details, reason for transfusion, related laboratory data and complications of transfusion. The appropriateness of transfusion was ascertained using the RCOG guidelines for RBC transfusion in obstetric patients. **Results** The incidence of RBC transfusion among all obstetric admissions was 4.1%. The incidence of RBC transfusion was high in patients with caesarean when compared to vaginal delivery (7.6 versus 2.8,  $p < 0.01$ ). Antenatal anemia (37%) was the most common diagnosis requiring transfusion, followed by post partum hemorrhage (15%). The rate of inappropriate RBC transfusion in the study was 3 percent. **Conclusion** 61.6% received single unit transfusion, 22.7% two units and 15.7% received more than two units transfusion. Overall there appeared to be a low threshold for red cell transfusion with 53% transfusion happened when hemoglobin below 7g/dL. The rate of inappropriate RBC transfusion in the present study was 3% according to RCOG guidelines.

### KEYWORDS :

#### Background

Blood transfusion is a common and important component of medical therapeutics. Obstetric conditions associated with the need for blood transfusion may lead to morbidity if not managed correctly. Obstetric hemorrhage is often sudden, unexpected and encompasses antepartum, intra-partum, and postpartum bleeding. The administration of red cell transfusions during pregnancy and in the peripartum period is not uncommon, occurring in 2-3% of all pregnancies (1,2).

Average blood loss during vaginal delivery is between 300 to 500 ml, whereas in most caesarean section deliveries it is around 900 to 1100 ml (3,4). The increased blood volume associated with normal pregnancy typically accommodates obligatory blood loss that occurs during vaginal or caesarean delivery.

Blood transfusion, when used appropriately, can be a life saving intervention; however inappropriate use can endanger life because of the potential risks of acute or delayed complications. This has encouraged evidence-based blood transfusion in all areas of medicine. Various studies have attempted to define trigger values for blood component transfusion. Some studies have changed clinical practice in surgical specialties and intensive care medicine; however, similar studies are limited in obstetric population (5-7). Interest in understanding transfusion practices in obstetrics is also increasing.

Despite available guidelines, a significant proportion of transfusion is not in accordance with these guidelines. Continuous monitoring of transfusion activity as well as implementation and optimization of transfusion strategies may help to improve transfusion practice.

#### Methods

This was a prospective study conducted in tertiary care obstetric centre in South India. The study protocol was approved by the Institute Ethics Committee prior to the commencement of the study. The study analyzed transfusion request forms of obstetric patients, for whom transfusion was given for one year period.

Clinical details were recorded in pro forma from the request form submitted and maternal case record. These included patient demographics, provisional diagnosis (e.g. abortion, ectopic pregnancy, placenta previa, abruptio placenta, postpartum hemorrhage, HELLP, DIC, etc.), indications for transfusion (i.e. whether transfused for anemia or hemorrhage), number of components transfused, adverse transfusion reactions. The incidence of major obstetric hemorrhage with blood loss of more than 2500 ml or acute transfusion of five or more units of red cells in our hospital was noted. The appropriateness of transfusion was ascertained using the RCOG guidelines for RBC transfusion in obstetric patients (8).

The data was analyzed utilizing Microsoft Excel for tabular transformation and graphical representation. GraphPad Instat version 3.0 was used for statistical analysis. For comparing the proportions between various groups and parameters Chi Square test with Yate's correction or Fisher's exact test was used. Differences in mean were analyzed by student t test.

#### Results

During the study period, there were 17275 obstetric admissions, which included 15191 deliveries, 325 abortions, 77 ectopic pregnancies, 49 molar pregnancies and 1633 admissions for other obstetric reasons. A total of 3675 patients (21.3% of all obstetric admissions) had requests for red cell transfusion. The incidence of RBC transfusion among all obstetric admissions was 4.1% during the study period. Plasma and platelets components were transfused only in 1.3% of obstetric admission.

The incidence of RBC transfusion was high in patients with caesarean when compared to vaginal delivery (7.6 versus 2.8,  $p < 0.01$ ). Spontaneous vaginal deliveries patients received significantly more transfusion rate than instrumental deliveries (3 versus 1.1). The average red cell units transfused for delivery were 1.8 units. There was no significant difference between blood transfusion for emergency and elective caesarian section (7.6 and 7.5,  $p = 0.92$ ) as shown in table 1.

Among the 2606 patients for whom a request was received as cover for labour or caesarean section, 2.1% patients required RBC transfusion (table 2). Postpartum hemorrhage (70.4%) followed by rupture uterus (14.8%) was the common indications in patients for whom blood was requested for cover.

Overall antenatal anemia (37%) was the most common diagnosis requiring transfusion, followed by post partum hemorrhage (15%) (table 3). The hemoglobin level of the patients did not seem to influence the transfused units. The pattern of number of red cell units transfused was similar, irrespective of the hemoglobin levels. Single unit transfusion was the most common in 61.6% patients (figure 1). Majority of the patients (52.3%) transfused had a hemoglobin levels between 6 and 10g/dL.

Major obstetric hemorrhage (MOH) was observed in 0.2% of the obstetric admission and post partum hemorrhage (36%) was the most common reason for MOH. Abruptio placenta (31%) was the most common reason for patients presenting with DIC. Plasma and platelet administration along with red cell transfusion during hemorrhage was observed in 69 and 54 percent of transfusion. Prophylactic plasma administration along with RBC transfusion during hemorrhage (69.3%) was the most common indication for transfusion. Raised

PT/INR was indicated in 19.7% patients. The mean number of units of plasma transfused was 7.3. The usage of cryoprecipitate was observed only in 1.5% patients. The adverse reactions amounted to 0.16% of 2500 blood component transfusion in the year.

34.5% patients with a hemoglobin level of less than 6g/dL and 18.5% patients with a hemoglobin level of 6 to 7 g/dL who were in labour/ immediate postpartum period were transfused. Also 30% patients with hemoglobin level of 7 to 10 g/dL and 3.5% patients with a hemoglobin level of more than 10g/dL were transfused for associated hemorrhagic events. Transfusion is considered appropriate in these circumstances. The rate of inappropriate RBC transfusion in the study was 3 percent (table 4).

**Discussion**

Despite available guidelines, concerns have been raised about the appropriateness of use of blood transfusion in obstetrics. Auditing the blood ordering practice may improve the efficiency of the use of blood for transfusion in patients. This study was conducted to analyze transfusion practice in obstetric patients, and to ensure the appropriate use of blood components.

Over the past years in several centers, there has been a trend towards a reduced use of blood transfusion in obstetric practice (9). The reasons for this are realization that blood transfusion is unnecessary for many cases previously treated by transfusion, fears about risks of transfusion transmitted infections and finally increase in cost.

We observed a higher rate of RBC transfusion (4.1%) in our obstetric patients, with respect to western literature (0.6 to 3%), as our center caters to high-risk obstetric populations in the region (1,2,8). The present study observed 71% of the requests were made to provide for cover for surgeries or diagnosis with potential for blood transfusion, and among them only 2.1% received RBC transfusion.

Among the modes of delivery, vaginal delivery causes the least amount of blood loss. The baseline transfusion rate in spontaneous vaginal birth is about 3% and with instrumental delivery 1.1%. This was in contrast to study from literature where transfusion risk ranges from 0.4 to 1.6% for spontaneous vaginal delivery and 1.5 to 4.8% for instrumental delivery (9).

Caesarean delivery has been identified as a common indication for blood transfusion, because it involves risk of major intra-operative blood loss. The incidence of red cell transfusion rate among the patients with caesarean section ranges from 0.6 to 6.8% in the developed countries and up to 25% in developing countries (10-12). The RBC transfusion rates for both elective and emergency caesarean section were similar for developing countries. (1,13). This variation may reflect the difficult characteristics of the populations, but it may also reflect the different transfusion practices between clinicians and between different hospitals and regions.

Anemia in pregnancy is common in most developing countries, ranging from 35 to 75% (14). Carson et al in their study on obstetric population observed RBC transfusion for patients with anemia during pregnancy was 12% (5). The present study had 37% patients with anemia being the most common reason for transfusion. This was in contrast to studies from West, in whom postpartum hemorrhage was the most common reason for transfusion. The finding of our study could be explained by the fact that anemia is much more common in our population of low socioeconomic status. The incidence of MOH was 0.4% in the present study, comparatively lower than western studies ranging from 1.1 to 4.5% (15,16).

Single unit red cell transfusions have been subjected to extensive criticism in the past. The present study had 61% single unit RBC transfusion and studies from developing country with a similar patient base, had same results. We observe that single unit transfusion would be still sufficient for specific group of patients. We feel that better awareness toward triggers and proper dosing can help us conserve red cell units.

The transfusion of red cells, when given to a patient with signs and symptoms of anemia is often beneficial, and may even be life saving. Many studies investigating the red cell transfusion found that a significant proportion of transfusions are inappropriate (2,17,18). Three percent patients received transfusion for low hemoglobin level without symptoms of anemia and were considered inappropriate in the

present study. The disparity in numbers between the different studies reflects different criteria used to judge the appropriateness of transfusions and difference in sample size and patient population.

In summary, there appeared to be a low threshold for RBC transfusion in obstetric population in our centre. In total 53% transfusion happened when hemoglobin below 7g/dL. The rate of inappropriate RBC transfusion in the present study was 3% according to RCOG guidelines. The main recommendation is clinicians must clearly document the indication, the person who makes the decision for transfusion, the procedure, the effect of transfusion. This can lead to more effective utilization of blood products and can also avoid legal complications

**Table 1:** Relationship between type of delivery, percentage of patients transfused and mean units of RBC transfused

Type of delivery	No. of patients	% patients transfused	Mean RBC units per
Vaginal			
Spontaneous	11435	3.0	1.8
Instrumental	1418	1.1	1.5
Caesarian			
Emergency	1859	7.6	1.9
Elective	479	7.5	1.8

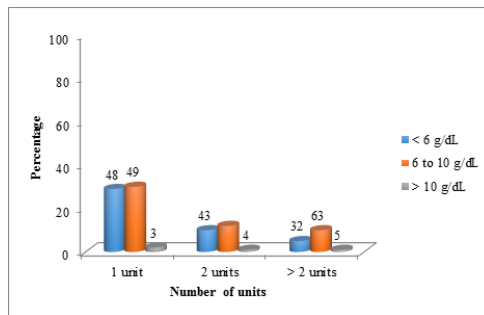
**Table 2:** Percentage of patients in whom blood was requested for cover received RBC transfusion

Diagnosis	No. of patients	% patients transfused
Patients in labour	1132	2.2
Caesarean section	1474	1.9

**Table 3:** RBC units transfused for specific diagnosis

Diagnosis	Patients transfused %
Anemia	37
Postpartum hemorrhage	15
Abruptio placenta	9
Placenta previa	8
Ectopic pregnancy	8
Abortion	6
Rupture uterus	5
DIC	4
HELLP syndrome	3
Indeterminate APH	3
Hydatidiform mole	2

**Figure1:** Relationship between Hemoglobin levels and number of units transfused



**Table 4:** Appropriateness of RBC transfusion using RCOG Guidelines (8)

Indications	Hb <6g/dL	Hb 6 to 7g/dL	Hb 7 to 10 g/dL	Hb >10 g/dL
Anemia				
With symptoms	19.5	1	0.5	0
Without symptoms	13.5	8.5	3	0
Hemorrhage	11.5	9	30	3.5

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