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Dr. Nanda Shankar Rao Shinge
Associate Professor, Department of
Obstetrics and Gynaecology,
Subbaiah Institute of Medical
Sciences, Shivamogga, Karnataka,
India

Dr. Mayekar Shonali
Assistant Professor, Department of
Obstetrics and Gynaecology,
Subbaiah Institute of Medical
Sciences, Shivamogga, Karnataka,
India

Corresponding Author:
Dr. Mayekar Shonali
Assistant Professor, Department of
Obstetrics and Gynaecology,
Subbaiah Institute of Medical
Sciences, Shivamogga, Karnataka,
India

A study on intrapartum blood and blood product transfusion in tertiary care centre

Dr. Nanda Shankar Rao Shinge and Dr. Mayekar Shonali

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Abstract

Introduction: Blood transfusion services are vital to maternal health because obstetric haemorrhage has been the foremost cause of maternal mortality in India. ¹ Common obstetric emergencies which require blood and blood components transfusion are acute blood loss in first half of pregnancy due to conditions like complications of abortions, ectopic pregnancy rupture and vesicular mole.

Material and Methods: This is prospective study conducted at Department of Obstetrics and Gynaecology, Subbaiah Institute of Medical Sciences, over a period of 1 year. Inclusion criteria: All patients requiring intrapartum transfusion of blood or blood products are enrolled in the study. Exclusion Criteria: No exclusion criteria.

Result: In our study, various age groups of patients were enrolled. Maximum transfusion rates are seen in the age group of 21-30 years. Multigravida are at more risk for requiring transfusion. Patients with irregular Antenatal care (ANC) visits are more prone to obstetric complications, because of lack of awareness of proper ANC care. More than half of the cases had anaemia in moderate range. Post-Partum Haemorrhage (PPH) is the commonest indication requiring blood transfusion followed by Antepartum haemorrhage (APH) and Pregnancy induced hypertension (PIH) Emergency procedure are at more risk of requiring transfusion. Most of the patients were in the moderate anaemia range, only packed red cell transfusion sufficed the haemostatic requirement.

Conclusion: Blood transfusion is lifesaving essential component of obstetric care. Acute obstetric blood loss is usually unpredictable and sudden. The decision to transfuse should be time taken to maintain adequate tissue oxygenation in the face of acute hemorrhage. Identifying the risk factors for hemorrhage in antenatal period and anticipating bleeding is essential in managing obstetric hemorrhage. A preplanned, multidisciplinary protocol yields the best results in the.

Keywords: Component transfusion, fresh frozen plasma/packed red blood, obstetric hemorrhage

Introduction

Blood transfusion services are vital to maternal health because obstetric haemorrhage has been the foremost cause of maternal mortality in India ^[1]. Common obstetric emergencies which require blood and blood components transfusion are acute blood loss in first half of pregnancy due to conditions like complications of abortions, ectopic pregnancy rupture and vesicular mole ^[2]. In later half of pregnancy, there can be haemorrhage due to placenta previa or accidental haemorrhage. During labour, women may present with severe anemia and may develop third stage haemorrhage or other complications resulting in severe blood loss and sudden deterioration in general condition can occur ^[3]. Immediate and rapid replacement of sufficient and safe blood and its components becomes essential to save the lives of women ^[4]. The use of blood and its components has become a lifesaving strategy in management of obstetric haemorrhage in general and PPH in particular ^[5].

Anemia of pregnancy is defined as haemoglobin concentration < 11 g/dl. Transfusion is almost always indicated when Haemoglobin (Hb) is less than 7 g/dl to reduce the rate of maternal morbidity and mortality ^[6]. In India the prevalence of anemia is around 65-75% ^[7]. Obstetric haemorrhage is defined as any blood loss associated with pregnancy or parturition which may be revealed or concealed and is likely to endanger life. Patients usually present with shock which requires urgent blood and its components transfusion. According to sample registration survey (1997-2003), postpartum haemorrhage accounts for nearly 38% of all maternal deaths ^[8]. The management of obstetric haemorrhage is more challenging than haemorrhage in non-pregnant patients because of hypervolemia of pregnancy by approximately 50%. Signs of hypovolemia occur relatively late because of physiological changes in pregnancy.

The extent of intravascular volume deficit is not reflected by visual estimates of vaginal bleeding [9]. 30 years in table no. 1

Material and Methods

This is prospective study conducted at Department of Obstetrics and Gynaecology, Subbaiah Institute of Medical Sciences, over a period of 1 year.

Inclusion criteria: All patients requiring intrapartum transfusion of blood or blood products are enrolled in the study.

Exclusion Criteria: No exclusion criteria

Result:

In our study, various age groups of patients were enrolled. Maximum transfusion rates are seen in the age group of 21-

Table 1: Distribution of age group

Age	No. of Patients (n=140)	Percentage (%)
<20	22	15.7
21-30	104	74.2
31-40	14	10

Table 2: Gravida Score of patients

Gravida	No. of Patients (n=140)	Percentage (%)
Primigravida	42	30.0
Multigravida	78	55.7
Grand Multigravida	20	14.2

In table 2, Multigravida are at more risk for requiring transfusion

Table 3: Booking Status of patients

Booking Status	No. of Patients (n=140)	Percentage (%)
Booked	26	18.5
Irregular ANC visits	106	75.7
Not booked	8	5.7

In table 3, patients with irregular ANC visits are more prone to obstetric complications, because of lack of awareness of proper ANC care.

Table 4: Haemoglobin Level of Patients

Hb (gm/dl)	No. of Patients (n=140)	Percentage (%)
Severe	8	5.7
Moderate (6.1 -8.9)	78	55.7
Mild (9- 10.9)	42	30.0
Normal	12	8.5

In table 4, more than half of the cases had anaemia in moderate range.

Table 5: Indication of Blood Transfusion

Complications	No. of Patients (n=140)	Percentage (%)
Atonic PPH	22	15.7
Traumatic PPH	18	12.8
Placental Abruption	14	10.0
Placenta Previa without Accreta/Percreta/Increta	12	8.5
Placenta Previa with Accreta/Percreta/Increta	2	1.4
HELLP Syndrome	12	8.5
Antecedent Anemia	50	35.7
Thrombocytopenia	10	7.1

In table 5, PPH is the commonest indication requiring blood transfusion followed by APH and PIH

Table 6: Mode of Delivery

Mode of Delivery	Total No. of Delivery	Transfusion Cases	Percentage (%)
Vaginal Delivery	1674	62	3.7
Caesarean (elective)	586	22	3.7
Emergency caesarean	652	56	8.5

In table 6, Emergency procedure are at more risk of requiring transfusion.

Table 7: Blood Product Transfused to the patients

Blood Product Transfusion	No. of Patients	Percentage (%)
Packed Cell Transfusion	108	77.1
PCV + Blood Components (FFP + PRC/ Cryoprecipitate)	26	18.5
Only Platelets	6	4.2

In table 7, Most of the patients were in the moderate anaemia range, only packed red cell transfusion sufficed the haemostatic requirement.

Table 8: Maternal Mortality of the patients

Causes	No. of Patients	Percentage (%)
DIC	4	2.85
Severe Anaemia	2	1.42

In table 8, In spite of receiving adequate blood transfusion MMR occurred due to causes like septicaemia, AKI, disseminated intravascular coagulation (DIC).

Discussion

Obstetric hemorrhage is the commonest cause of maternal death, causing one-fourth of maternal deaths yearly [9]. Massive and life-threatening obstetric hemorrhage occurs in 3–5% and 0.1% of deliveries, respectively, and blood product transfusion is required in 0.3–1% [10]. Anemia during pregnancy is significant cause of maternal mortality and morbidity. The decision for transfusion was done in this study when the Hb < 7 gm%, and there were < 4 weeks for delivery or in labor. This trigger for transfusion of blood has been controversial, and the Cochrane review favors the restrictive transfusion policy for the safety of the patients. Postpartum PRBC transfusion in our study was only given if patient was prone to bleeding due to some medical condition [11].

During pregnancy, the changes in the coagulation and the fibrinolytic system in form of enhancement and inhibition respectively occur, large volume blood loss causes consumptive loss of coagulation factors, which causes more bleeding and starts a vicious cycle ending up with DIC. These obstetric hemorrhages could be massive and may require replacement of one entire blood volume within 24 h or replacement of 50% of total blood volume (TBV) within 3 h, i.e., massive blood transfusion (MBT). The setting of massive transfusion protocols (MTPs) describes 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 [12].

The different components of the blood play different functions, and there is a need to realize that the component therapy is the need for the present day. The blood component therapy should not be just started on the basis of one investigation like Hb or platelet count, but the clinical profile of the patient, present condition, possibility of rebleed etc., should also be the guiding factor. Each bag of packed RBCs has 150–200 ml RBCs and 75 ml plasma with a hematocrit of around 60%. These are indicated when we have insufficient RBCs in circulation or there is decrease in oxygen-carrying capacity of blood. Vachhani *et al.* in their study discouraged practice of single-unit transfusion citing it as avoidable in majority of the cases, and the risks involved in blood transfusion can cause more damage than benefit to the patient [13].

Platelets or fresh frozen plasma (FFP) is to be given as required. FFP is used in correction of microvascular bleeding, multiple coagulation factor deficiencies, massive transfusion with coagulation abnormalities and platelet concentrates when the platelet counts fall below 20,000/mm³. One unit of platelets increases the platelet count by 5000–7000/l. There is no role of prophylactic platelet transfusion; one needs to investigate and treat the cause. If the coagulation profile is not available, four units of FFP are given for four units of blood transfused within 24 h [14].

Transfusion is a lifesaving procedure, but approximately 1% of all transfusions cause an immediate and delayed adverse reaction, despite the measures taken to reduce risks. Transmitted infections, hemolytic reactions, transfusion-associated acute lung injury (TRALI), hypocalcemia, hypomagnesemia, hyperkalemia, problems of massive transfusion such as hypothermia, metabolic acidosis and abnormalities of coagulation should deter all of us from indiscriminate use of blood components [15].

Increased capacity to tolerate bleeding due to physiological changes and often inaccurate estimation blood loss in obstetrics may not show change in their vital signs, resulting in a delay in the detection and treatment [16].

During the study period, the incidence of blood product transfusion for obstetric patients during in our institution was 3.7% (31/837), which was similar to previously reported studies: 0.3–1% by James [17]. Patients who had blood product transfusion received two or more units of PRBCs, nine had received three PRBCs, and three patients had received four units of PRBCs, which is also similar to earlier study by Butwick *et al.* [18]. Thirteen patients were transfused FFP, and as per the hospital protocol those requiring both PRBCs and FFP were transfused in the ratio of 1:2, whereas a study by Borgman recommended transfusion of PRBC & FFP at a ratio of 1:1.4 [19].

Conclusion

Blood transfusion is lifesaving essential component of obstetric care. Acute obstetric blood loss is usually unpredictable and sudden. The decision to transfuse should be time taken to maintain adequate tissue oxygenation in the face of acute hemorrhage. Identifying the risk factors for hemorrhage in antenatal period and anticipating bleeding is essential in managing obstetric hemorrhage. A preplanned, multidisciplinary protocol yields the best results in the management. Overall incidence of blood component utilization has significantly increased in the recent years, but still, the use of whole blood is preferred by many clinicians because of its easy availability in the blood banks.

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