

## BLOOD TRANSFUSION IN OBSTETRIC HAEMORRHAGE AND THEIR OUTCOME IN TERTIARY CARE HOSPITAL IN RURAL AREA

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### ABSTRACT

#### BACKGROUND

Obstetric haemorrhage remains the main cause of maternal mortality and morbidity, even though advanced medical and surgical managements and blood transfusions are available. Haemorrhagic shock is a very serious complication. Obstetric haemorrhage occur either in antepartum, intrapartum or postpartum period. Here, our aim is to study the outcome of blood transfusion in obstetric haemorrhage patients.

Study Method- Retrospective observational study.

#### MATERIALS AND METHODS

In present study, 250 patients of obstetric haemorrhage who were in antepartum, intrapartum and postpartum period were included. Amount of various blood transfusion products used were noted. Patient's outcome like safe discharge, morbidity and mortality were noted.

#### RESULTS

1423 units of blood and blood components transfusion was done on 250 obstetric haemorrhage patients. Out of 250 patients 228 patients were discharged in stable condition, 4 patients were referred to higher centres for dialysis and 18 maternal mortality was noted.

#### CONCLUSION

The management of obstetric haemorrhage is a challenging task which needs a team work of improved obstetric care, anaesthesiologist support, timely interventions, availability of blood and blood products and intensive care unit.

#### KEYWORDS

Obstetric haemorrhage, maternal outcome, blood transfusion.

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#### BACKGROUND

Obstetric haemorrhage is the main cause of maternal morbidity and mortality. WHO data indicates haemorrhage accounts for 35% of maternal mortality. Antepartum, intrapartum and postpartum haemorrhage can be managed effectively by the management of obstetric cause of bleeding and blood transfusion.

The aim of the study was to determine the outcome of blood transfusion in obstetric haemorrhage patients.

#### MATERIALS AND METHODS

This study was conducted at the Department of Anaesthesia in Government Theni Medical College, Theni, from January 2013 - December 2016. It was a Retrospective Observational study. This study was conducted in patients who underwent surgery in emergency operation theatre. These patients were under antepartum, intrapartum and postpartum periods. Ectopic rupture and abortion in early pregnancy; abruption and placenta previa in late pregnancy; intrapartum and postpartum atonic PPH, traumatic PPH and secondary PPH.

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#### RESULTS

Parameter	Compensated	Mild	Moderate	Severe
Blood loss (mL)	1000	1500	1500-2000	≥2000
Heart Rate (bpm)	100	101-120	121-140	≥140
Blood pressure (mmHg)	Normal	Orthostatic hypotension	Marked fall	Profound fall
Capillary refill	Normal	May be delayed	Usually delayed	Always delayed
Respiratory Rate	Normal	Mild increase	Moderate tachypnoea	Marked tachypnoea
Urinary output	≥ 30	20-30	5-20	Anuria
Mental status	Normal agitated	Agitated	Confused	Lethargic/ obtunded

**Table 1. Classification of Haemorrhagic Shock<sup>[1,2,3]</sup>**

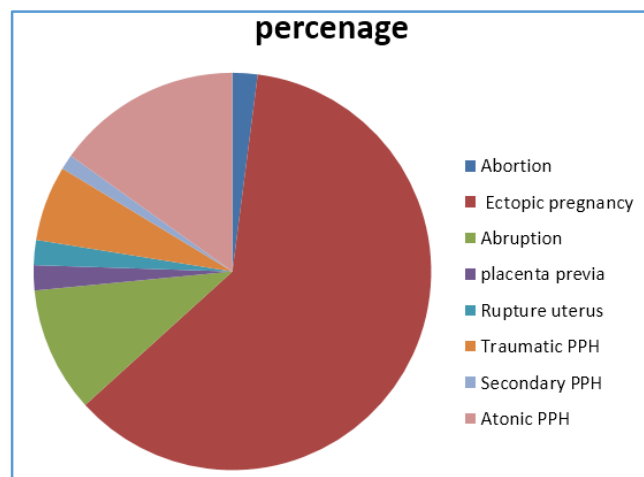
Shock occurs when there is hypoperfusion of vital organs, which will vary depending on the volume and rate of blood loss.<sup>[4,5]</sup> A defined volume of blood loss is difficult to measure due to physiological changes and comorbid conditions. The loss evaluated is usually underestimated up to 35%.<sup>[6,7]</sup> The initial resuscitation is with isotonic crystalloid solution. In emergency situations, O negative blood can be used. Investigation, diagnosis and definitive treatment either by

medical or surgical intervention to arrest bleeding at the earliest is must. Many available guidelines for transfusion are mostly from developed countries; however, they can be used by developing countries keeping available resources in perspective. For maternal outcome, the mortality and morbidity were considered. All information was gathered and results were analysed.

Sl. No.	Aetiology	Number of Patients	Percentage
1	Abortion	5	2%
2	Ectopic pregnancy	150	60%
3	Abruptio placenta	25	10%
4	Placenta previa	5	2%
5	Rupture uterus	5	2%
6	Traumatic PPH	15	6%
7	Secondary PPH	3	1.2%
8	Atonic PPH	42	14.8%

**Table 2. Distribution of Aetiology of Our Study Patients**

Table 2 shows even though ectopic pregnancy was high (60%) in our study; the atonic PPH (14.8%) was the commonest cause of severe obstetric haemorrhage in our emergency theatre, since out of 150 ectopic patients 100 patients were in compensated stage.



**Graph 1. Distribution of Classification of Shock**

Table 3 shows all the obstetric haemorrhage patients presenting in our emergency operation theatre, the severity of haemorrhagic shock was also high in atonic PPH patients.

Sl. No.	Aetiology	Compen-sated	Mild	Moderate	Severe
1	Abortion			2	3
2	Ectopic	100	30	15	5
3	Abruption		5	15	5
4	Placenta previa		3	2	
5	Rupture uterus			3	2
6	Traumatic PPH	5	5	5	
7	Secondary PPH			2	1
8	Atonic PPH		5	22	15

**Table 3. Distribution of Classification of Shock**

Aetiology	Whole Blood	Packed Cell	FFP	Platelet	Total
Abortion	15	10	20	4	49
Ectopic	170	200	120	5	495
Abruption	50	70	105	6	231
Placenta previa	10	15	8		33
Rupture uterus	15	14	16	3	48
Traumatic PPH	20	25	30		75
Secondary PPH	10	10	15	2	37
Atonic PPH	140	145	150	20	455
<b>Total</b>	<b>430</b>	<b>489</b>	<b>464</b>	<b>40</b>	<b>1423</b>

**Table 4. Distribution of Usage of Blood Components**

Table 4 shows the usage of blood components are high in Atonic PPH where we used WB, PC, FFP and Platelets. The number of Ectopic patients were high and most of them had single unit blood transfusion.

Table 5 shows out of 250 patients, 3 patients had mild allergic blood transfusion reaction which was managed by steroids. Four patients went for acute renal shutdown and they were referred for dialysis; 60 patients of moderate and severe haemorrhage were put on mechanical ventilation and extubated after 24 hours; 18 patients died. Out of 18 patients, 13 died of DIC. The commonest cause of our hospital mortality was DIC. Two patients died due to sepsis (septic abortion), 2 patients from renal failure and 1 patient from ARDS.

Sl. No.	Maternal Outcome	Number of Patients (n=250)	Percentage
1	<b>Morbidity</b>		
	1. Mild acute blood transfusion reaction	3	1.2%
	2. ARF	4	1.6%
	3. Mechanical ventilation	60	24%
2	<b>Mortality</b>		
	1. DIC	13	7.5%
	2. Sepsis	2	
	3. Renal failure	2	
	4. ARDS	1	
3	Referral		1.6%
	Acute renal shutdown	4	
4	Discharged in good condition	228	91%

**Table 5. Distribution of Maternal Outcome**

**DISCUSSION**

Management of obstetric haemorrhage is more challenging for anaesthesiologist. In pregnant woman, there is 50% physiological increase in intravascular volume (i.e. 4 - 6 L). Therefore, the signs of haemorrhagic shock such as tachycardia, hypotension and a cold clammy skin were seen after a significant loss of blood. The extent of intravascular volume deficit is not correctly reflected by the vaginal bleeding.<sup>[8,4]</sup>

Standard definitions of postpartum haemorrhage, that is > 500 mL after vaginal delivery and > 1000 mL after caesarean section do not adequately reflect the clinical response of the patient. Definitions of massive haemorrhage vary and have limited value. It may arbitrarily be considered a situation where 1 - 1.5 L of blood volumes may need to be transfused acutely or in a 24-h period where normal blood volume in the

adult is taken as approximately 7% of ideal body weight. Other definitions include 50% blood volume loss within 3-h or a rate of loss of 150 mL/min.

Haemorrhagic shock is caused by a reduction in the circulating blood volume. The decreased circulating volume leads to decrease in oxygen supply to cells, which leads to organ dysfunction.<sup>[4,6]</sup> The human body tries to compensate for the blood loss. This mechanism aims to protect the vital organs (brain and heart) in an attempt to sustain life.

If unrecognised or left untreated, cell death due to hypoxic injury will follow.<sup>[6]</sup> So oxygenation is very important. The outcome is dependent on three basic principles; 1. Early adequate giving of supplemental oxygen, 2. Arrest the bleeding and 3. Replacing the blood loss.<sup>[5,9]</sup>

Most protocols recommend maintaining a target HCT of 21% - 24%. Hébert et al showed that restrictive transfusion and liberal transfusions were of equivalent value in critically ill patients, while relatively stable patients undergoing liberal transfusions had a higher 30-day mortality.<sup>[10]</sup> The conclusive consensus from various protocols and guidelines suggest that the transfusion is rarely indicated in Hb > 10 g/dL. If Hb is < 6 g/dL transfusion is indicated irrespective of cause and condition of the patient. If Hb is between 6 and 10 g/dL, the indication will depend upon whether patient is actively bleeding or having history of previous haemorrhage or having some medical condition where optimal Hb of > 7 g/dL is required.<sup>[11]</sup> The common goals for transfusion in the obstetric patient<sup>[12]</sup> is to achieve-

- Haemoglobin > 8 g/dL,
- Platelet count > 75 × 10<sup>9</sup>/L,
- Prothrombin time (PT) < 1.5 × mean control,
- Activated PT < 1.5 × mean control, and
- Fibrinogen > 1.0 g/L.

Patients receiving less than 10 units of RBC's rarely need component replacement. The lowest mortality occurs in patients where ratio of plasma: RBC's is 1:1. Both the CMQCC Toolkit and the RCOG Green top Guideline No. 52 recommend a ratio of PRBC, fresh frozen plasma and Platelet of 6: 4:1 in cases of massive haemorrhage.<sup>[13,12]</sup>

Recombinant factor VII is an expensive therapy that may be considered in obstetric haemorrhage. It is primarily used as a treatment of uncontrolled haemorrhage in trauma setting. It causes a thrombin burst and promoting clotting in open vessels. Its effectiveness is markedly diminished by hypothermia and acidosis. So, effective resuscitation towards normal physiology is a prerequisite of its use. It is given in a dose of 90 µgm/kg. It had thrombotic complications.

Intraoperative cell salvage is a technique in which patient's own blood cells are re-transfused after separation from lost blood.<sup>[14]</sup> IBS has been used in both anticipated and unanticipated massive haemorrhages like ectopic pregnancies,<sup>[15]</sup> caesarean sections, in vaginal deliveries and is acceptable under certain circumstances to Jehovah's witnesses.<sup>[16]</sup> The risk of IBS is embolism and alloimmunisation. To reduce this risk cell salvage is usually started after the majority of the amniotic fluid has been suctioned. A leucocyte depletion filter should be used prior to reinfusion of the salvaged blood to remove additional contaminants that the washing process may not clear. Cell salvaged blood contains only red blood cells with no clotting factors and platelets.

Antifibrinolytics help in reduction of blood loss during obstetric surgeries and other haemorrhages. Tranexamic acid is a potentially useful drug, which is widely available. It can decrease bleeding and reduce the need for further transfusion without many major side effects. The initial dose is a slow intravenous infusion of 1 gram followed by a further 1 gram four hours later. Some studies have shown that tranexamic acid reduces the postpartum haemorrhage.<sup>[17]</sup>

The other conservative treatment is administration of uterotonic drugs. The commonly used uterotonic drugs are oxytocin, methylergometrine, prostaglandin F2α (carboprost) and prostaglandin E1 analogue (misoprostol).

Oxytocin causes vasodilation and is harmful in the haemodynamically unstable patient. It is given slowly in the infusion at a rate of 10 IU/hour for four hours.

Ergometrine is given in a dose of 400 µgm, either slow intravenous route or intramuscular. It causes nausea, vomiting and may precipitate hypertension. So it should be avoided in pregnancy-induced hypertension and heart disease complicating pregnancy.

Prostaglandin F2α (carboprost) is given in a dose of 0.25 mg intramuscularly and repeated upto 2 mg. Intramyometrial administration has a more rapid onset. Side effects are hypertension, pulmonary hypertension and bronchospasm. It should be avoided in bronchial asthma patients.

Misoprostol is useful in combination with other uterotonic agents. It can be used rectally, orally or sublingually. The recommended dose is 800 µgm.

After controlling the acute situation, care should be given to avoid the occurrence of rebound hypercoagulation and the risk of thromboembolism. Pregnant women are physiologically hypercoagulable and those who have received blood products have a further increase in the incidence of thromboembolic disease. To avoid this, thromboprophylaxis should be given and compression stockings should be worn.

## CONCLUSION

Obstetric haemorrhage is the commonest cause of maternal mortality. Early resuscitation with simultaneous detection of the cause and treatment is more important. Improved obstetric care, timely intervention and ready availability of blood and blood products may reduce the maternal mortality. In our hospital from our study out of 250 obstetric haemorrhage patients, 18 patients died of DIC, Sepsis, ARF and ARDS. Out of this, DIC is the commonest cause of mortality. Four patients were referred for dialysis. 228 patients were discharged with good general condition.

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