

Role of Blood Transfusion in Obstetric Emergencies

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Abstract

Background: Haemorrhage from obstetrical causes is the most common cause of maternal mortality in the developing world. Despite all efforts, the number of maternal death due to haemorrhage is still rising. Many programs have been focused on improving the management of woman with obstetric haemorrhage. At the same time, fears about the safety and the supply of whole blood have promoted efforts to encourage evidence-based blood transfusion and to consider ways in which allogenic transfusion can be minimized. Allogenic blood transfusion carries risks, such as administration errors, transmitting infections and immunological reactions.

Objective: To evaluate the indications and adverse effects related to emergency blood transfusion in obstetric patients in tertiary level hospital.

Methods: This was a descriptive cross-sectional study conducted on 50 obstetric patients who received blood transfusion for obstetric haemorrhage, clinically diagnosed as having moderate to severe anaemia, in the department of Obstetrics and Gynaecology, Dhaka Medical College hospital during the period of 1 January to 30 June, 2013.

Results: The mean (\pm SD) age of the study patients was 25 ± 4.1 years, majority (84.0%) patients were multigravidae and the mean gravidae was 2.6 ± 1.14 . Majority of the patients came from low socioeconomic condition and 10.0 % patients had history of blood transfusion in the previous pregnancy. All patients were anaemic and most (60.0%) patients had moderate to severe anaemia. Causes of anaemia was due to acute blood loss (82.0%) and for iron deficiency in 18.0% cases. PPH, APH, ruptured uterus, ectopic pregnancy and iron deficiency were common causes of indication for blood transfusion. Maximum record of blood transfusion was more than 5 units, found in 12.0% of patients. Professional and non professional donor were 52.0% and 48.0% respectively. More than half of the (62.0%) blood transfusions were delayed for 5-10 hours. The untoward events of blood transfusion were found in 36.0% of patients and all patients were recovered.

Conclusion: Bleeding during pregnancy and labour are the important cause of maternal morbidity and mortality in developing country like Bangladesh. Blood transfusion in obstetric condition decreases the morbidity and mortality of mother and/or baby if used correctly.

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Introduction

Emergency whole blood transfusion is a life saving measure. The appropriate use of whole blood and blood products means the transfusion of safe blood products only to treat a condition leading to significant morbidity and mortality that cannot be prevented or managed effectively by other means.¹

Haemorrhage from obstetrical causes is the most common cause of maternal mortality in the developing world. Despite all efforts, the number of maternal death due to haemorrhage is still rising.² Fears about the safety and the supply of whole blood have promoted efforts to encourage evidence-based blood transfusion and to consider ways in which allogenic transfusion can be minimized. Allogenic blood transfusion carries risks, such as administration errors, transmitting infections and immunological reactions.³

Blood transfusion is indicated when signs of insufficient tissue oxygenation are present. Haemoglobin level of < 6 gm/dl is an indication for blood transfusion without a specific sign of insufficient oxygenation.⁴

Whole blood transfusion carries a risk of adverse effects, including febrile reaction, haemolytic reaction, anaphylaxis and alloimmunisation.⁵ Of primary concern currently, is the transfusion transmissible diseases that can be caused by viruses such as human immunodeficiency virus (HIV), hepatitis B and C, parasites, bacteria, malaria, prions and variant of Creutzfeldt-Jakob disease. Also new viruses such as hepatitis G and human herpes virus 8 have been detected.³ However, the estimated risk of infections has been reduced over the years in western countries.⁶

Blood transfusion is expensive and sometimes there is shortage of blood. Therefore,

transfusion alternatives that can reduce exposure to allogenic blood, thereby reducing risk and conserving the blood supply, are of crucial importance.⁷ Reducing blood transfusion in obstetric patients includes senior staff involvement, optimization of haemoglobin, surgical technique such as compression suture and ballon, uterine tamponade as well as early hysterectomy in the event of massive obstetric haemorrhage.⁸ It has been estimated that the appropriate and timely blood transfusion alone can reduce the maternal mortality and morbidity.⁹ It is a lifesaving therapy in obstetric practice. In the West, emergency blood transfusion service is provided by flying squad.⁹

Methods

This was a descriptive, cross-sectional study, conducted in the department of Obstetrics and Gynae, Dhaka Medical College Hospital, Dhaka, during the period of January, 2013 to June 2013. Sample size was 50. Patients receiving blood transfusion for obstetrical haemorrhage, obstetric patients clinically diagnosed as having moderate to severe anemia with obstetric complication like APH, were included in this study. Patients with anaemia due to other medical disorders like aplastic anaemia, renal failure, haemoglobinopathies, heart diseases, autoimmune diseases, coagulation disorders were excluded from this study.

Results

The mean (\pm SD) age of the study patients was 25 \pm 4.1 years, majority (84.0%) patients were multigravidae and the mean gravidae was 2.6 \pm 1.14. Majority of the patients came from low socioeconomic condition and 10.0 % patients had history of blood transfusion in the previous pregnancy. All patients were anaemic and most (60.0%) patients had

moderate to severe anaemia. Causes of anaemia was due to acute blood loss (82.0%) and for iron deficiency in 18.0% cases. PPH, APH, ruptured uterus, ectopic pregnancy and iron deficiency were common causes of indication for blood transfusion. Maximum record of blood transfusion was more than 5

units, found in 12.0% of patients. Professional and non professional donor were 52.0% and 48.0% respectively. More than half of the (62.0%) blood transfusions were delayed for 5-10 hours. The untoward events of blood transfusion were found in 36.0% of patients and all patients were recovered.

Table I: Age distribution of the study patients (n=50)

Age(in years)	Number of patients	%
≤ 20	7	14.0
21 – 25	18	36.0
26-30	20	40.0
31-35	3	6.0
>35	2	4.0

Mean ±SD 25±4.1
Range (min-max) 18 -36

Table II: Distribution of the study patients according to gravida (n=50)

Gravida	Number	%
Primi	8	16
2 nd	19	38
3 rd	13	26
4 th	6	12
>4	4	8

Mean ± SD 2.6 ± 1.14
Range (min-max) 1 - 5

Table III: Distribution of the study patients according to Socioeconomic condition (n=50)

Socioeconomic condition	Number of patients	%
Lower	36	72
Middle	14	28
Upper	0	0

Table IV: Distribution of the study patients according to H/O blood transfusion in previous pregnancy (n=50)

Blood transfusion in previous pregnancy	Number of patients	%
Yes	5	10
No	45	90

Table V: Distribution of the study patients according to Hb% in grams (n=50)

Hb % in grams	Number of patients	%
5.6	6	12.0
6	8	16.0
6.6	2	4.0
7	7	14.0
7.2	2	4.0
7.3	1	2.0
7.5	2	4.0
7.9	2	4.0
8	20	40.0

Mean \pm SD 7.4 \pm 1.1

Range (min-max) 5.6 - 8

Table VI: Distribution of the study patients according to degree of anaemia (n=50)

Degree of anaemia	Number of patients	%
Mild (8 - 10 gm/dl)	20	40
Moderate (< 8 - 7 gm/dl)	14	28
Severe (< 7 gm /dl)	16	32

Table VII: Distribution of the study patients according to cause of anaemia (n=50)

Cause of anaemia	Number of patients	Percentage
Acute blood loss	41	82
Iron deficiency	9	18

Table VIII: Distribution of the study patients according to indication of blood transfusion (n=50)

Indication of Blood transfusion	Number of patients	%
PPH	19	38.0
APH	18	36.0
Ruptured uterus	6	12.0
Ectopic pregnancy	2	4.0
Iron deficiency anaemia (moderate) in pregnancy	2	4.0
Iron deficiency anaemia (severe) in pregnancy	3	6.0

Table IX: Distribution of the study patients according to units of blood transfusion (n=50)

Units of blood transfusion	Number of patients	%
1 unit	10	20.0
2 units	8	16.0
3 units	10	20.0
4 units	9	18.0
5 units	1	2.0
>5 units	12	24.0

The above table shows the units of blood transfusion of the study patients. Maximum patients 12 (24%) needed more than 5 units of blood

Table X: Distribution of blood donors from where respondent received blood (n=50)

Types of donor	Number of patients	%
Professional donor	26	52
Non professional donor (Sister, brother, cousin, students, relatives)	24	48

Table XI: Distribution of the time delay for blood transfusion by the respondent (n=50)

Timely arrangement of Blood transfusion	Number of patients	%
No delay	19	38
5-10 hrs	31	62

The above table shows the time delay for blood transfusion by the respondent. Maximum delay in arrangement of blood transfusion was found 5 - 10 hours.

Table XII: Distribution of the study patients according to types of untoward events of blood transfusion (n=50)

Untoward events of blood transfusion	Reaction occurred	%
Febrile reaction	13	26
Urticarial	3	6
Circulatory overload	2	4

Discussion

Blood transfusion is indicated when signs of insufficient tissue oxygenation are present. These include haemodynamic instability (tachycardia and hypotension), oxygen extraction ratio $> 50\%$, mixed venous oxygen saturation $< 50\%$, mixed venous oxygen partial pressure < 32 mmHg and decreased oxygen consumption.⁴ However, others emphasized that haemoglobin level of < 6 gm/dl is an indication of blood transfusion without a specific sign of insufficient oxygenation (ASA 1996).¹³

This cross sectional study was carried out with an aim to assess the need for blood transfusion in obstetric patients and to find out the demographic profile, indications of blood transfusion, limitations in timely arrangement of blood transfusion and to find out the complications of blood transfusion in obstetric patients.

In this study it was observed that majority (40.0%) patients were found in 26-30 years age group and the mean (\pm SD) age was 25 ± 4.1 years with range from 18-36 years. Anorlu et al.¹⁶ have shown in their series, the mean age of the obstetric patients was 28.9 ± 5.2 years with range from 16-43 years, which closely resembled with the current study. In another study Abu-salem and Qublan¹⁴ have observed higher mean age of their obstetric patients and it was 31.6 years.

In the present study it was observed that 16.0% of the cases were primigravida and the rest 84.0% were multigravidae and the mean gravida was 2.6 ± 1.14 with range from 1-5. Similarly, Abu-salem and Qublan¹⁴ reported that multipara women accounted for 70.3 % of participants who received blood transfusions which is similar to the present study.

In this present series it was observed that most (72.0%) of the study patients came from lower and middle (28.0%) classes. Majority of them were from low socioeconomic condition who suffered from pre-existing anaemia, not in regular antenatal check-up, not aware of the need of blood transfusion and came for the antenatal check-up at last trimester. As a result, anaemia could not be corrected during pregnancy and PPH occurred to most of these patients. As lower class patients often come to hospital after trial of delivery at home, Caesarian delivery rate is high in this class and blood transfusion is mostly needed due to Caesarian section and PPH.

In this current series it was found that 10.0% patients had H/O blood transfusion in their previous pregnancy and the causes were PPH, APH, ruptured uterus pre-existing anaemia etc. As, Caesarian delivery rate is increasing in hospitals, blood transfusion rate is also in an increasing trend. Abu-salem and Qublan¹⁴ observed that previous blood transfusion was mentioned by 4.3 % of their study women which is comparable with the current study.

In this current series it was observed that the mean haemoglobin percentage among the study patients was 7.4 ± 1.1 gm/dl with range from 5.6 - 8 gm/dl. Of them 28.0 % were moderately anaemic and 32.0% were severely anaemic and 40.0% were mildly anaemic. These reveals that most of the patients (60.0%) were moderate to severely anaemic. All the study subjects came from lower to middle socioeconomic background who were anaemic during their pregnancy. So when any complication occurred during pregnancy and delivery like APH, PPH, Intrapartum haemorrhage, it aggravated the pre-existing anaemia which lead to need for blood transfusion. Similar observations regarding the haemoglobin percentage during pregnancy were also made by young et al.⁸

In this study it was observed that the cause of anaemia due to acute blood loss was 82.0% and iron deficiency was 28.0%. Acute blood loss was due to APH, PPH, ruptured uterus and ectopic pregnancy. Most of the patients came from lower and middle class of society who suffered from iron deficiency anaemia in pre pregnancy that was aggravated during their pregnancy. Causes of iron deficiency anaemia were nutritional deficiency, menstrual blood loss, hookworm infestation, bleeding piles. Khandra et al¹⁵ identified that the cause of anaemia was 43.0% due to iron deficiency.

Indications for blood transfusion were PPH (38.0%), APH (36.0%), ruptured uterus (12.0%), ectopic pregnancy (4.0%) and iron deficiency anaemia (10.0%). It was observed that Caesarian section rate is increasing now days in our country which is also reflected in our working hospital. As a result of repeat C/S rate, placenta praevia, placenta accereta, APH, PPH, and anaemia indications of blood transfusion were also increasing. Marcucci et al,¹⁷ Segal et al,⁷ Khadra et al¹⁵ and Goodnough et al⁵ found almost similar indications for blood transfusion in their study.

In this current study it was observed that professional donor and non professional donor (sister/brother/cousin/others) were 52.0 % and 48.0% respectively. Most of the patients received blood from professional donors. It is a concern, when women came for antenatal check-up, they were counselled for blood transfusion and to keep donors ready from family members during delivery.

Though some authors (Mc Vay et al,¹⁸ Ekeroma et al,¹⁰ Goodnough,⁵ Marcucci et al¹⁷) have mentioned that blood transfusion carries a risk of adverse effects, including febrile reaction, hemolytic reaction,

anaphylaxis and alloimmunisation. Of primary concern currently is the transfusion transmitted diseases that can be caused by viruses such as HIV, hepatitis B and C, parasites, bacteria, malaria, prions etc.

Untoward events following blood transfusion was 36.0 % and all patients were recovered. Among these patients, 26.0 % patients suffered from febrile reaction, 6.0 % had urticaria and 4.0 % had circulatory overload. This findings differ from the study of Binoy Barman et al,¹⁹ where transfusion hazard was in 11.84 % of patients, 3.16% had febrile reaction, 7.48 % had allergic reaction and 1.05 % had circulatory overload. Untoward events were found in patients who received either prolonged stored blood or blood from professional blood donors.

In this study it was observed that 38.0% respondent didn't delay for blood transfusion. More than half (62.0%) of blood transfusion was arranged within 5-10 hours of advice for requirement. Most of the patients received blood within 5-10 hours as they could not keep donors ready before delivery time. This time was taken for communication.

Conclusion

Emergency blood transfusion is a life saving measure. Most of my study patients needed emergency blood transfusion for resuscitation and they came from middle and lower socioeconomic condition. Majority of them belongs to multi gravida who were in irregular antenatal checkup. Indications of blood transfusion in this study group were mainly due to per operative bleeding during Caesarian section, PPH, APH and severe iron deficiency anaemia. Lack of in time arrangement of blood was mainly due to collection from non professional donors and communication delay. Complications of blood transfusion in my study group were febrile reaction and urticaria. Causes of blood transfusion was maternal acute blood loss and severe anaemia. To reduce the hazards of blood transfusion we have to reduce the need for blood transfusion. So, to reduce the need of blood transfusion pre pregnancy correction of anaemia, encouragement for regular ante natal check up, proper counselling and arrangement for blood transfusion especially in multi gravida patients are needed.

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