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Original Research Article

Analysis of transfusion of blood and blood products and their utilization pattern at department of obstetrics of tertiary care hospital

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ABSTRACT

Background: In developing countries, nutritional anaemia and obstetric complications are leading causes of transfusion of blood and blood products. The study was aimed to analyse utilization pattern and to identify the indications of transfusion of blood and blood products in obstetrics and to study outcome and management of pregnancy in patients who required blood and/or blood products.

Methods: This retrospective study was carried out at department of obstetrics of tertiary care teaching hospital from September 2018 to November 2018 and data was collected from all patients who had received transfusion of blood and/or blood products for any obstetric cause.

Results: A total of 164(6.8%) patients received blood and blood products transfusion. Department of obstetrics utilized maximum units of blood and FFP whereas PRC utilization was second highest. There were 62(37.8%) of patients who had not taken any antenatal care, whereas 64(39.0%) patients had less than 4 antenatal visits. Three most common indications for transfusion of blood and blood products were 63.4% in nutritional anaemia, 17.1% in obstetric haemorrhage and 11.6% in first trimester complications.

Conclusions: Three most common indications for transfusion were nutritional anaemia, obstetric haemorrhage and first trimester complications. Majority of patients had inadequate or no antenatal care. Early and regular antenatal care, early diagnosis and management of high-risk pregnancies and obstetric complications, institutional delivery can reduce the rate of transfusion of blood and blood products.

Keywords: Blood and blood products in obstetrics, Blood transfusion, Nutritional anaemia in pregnancy, Obstetric haemorrhage

INTRODUCTION

Blood transfusion is considered as one of the eight essential components of comprehensive emergency obstetric care, which has been shown to reduce the maternal mortality rates.¹

In developing countries like India, nutritional anaemia and obstetric complications are leading causes of blood and blood products transfusion in obstetrics. Here

prevalence of under nutrition and nutritional anaemia is very high; hence minimal amount of blood loss may lead to haemorrhagic shock. Abortion, ruptured ectopic pregnancy, self-ingestion of abortion pills, accidental haemorrhage and post-partum haemorrhage (PPH), bleeding during dilatation and evacuation (D/E) and caesarean section, adherent placenta, rupture uterus, disseminated intravascular coagulation (DIC), dengue and HELLP syndrome require transfusion of blood and/or blood products.. Acute obstetric blood loss is

usually unpredictable and sudden where good haemoglobin level of patients is very important for preventing maternal morbidity and mortality.

The utilization of blood in maternity hospital mainly depends on the number of deliveries and number of high-risk cases admitted. Many a times, there is shortage of blood in the blood banks, as the blood collection is much less than the blood requirement. Advanced blood bank technology and availability of blood components help in optimal utilization of scarce blood resources. Blood transfusion does carry risk of transmission of infections and anaphylactic reactions. Various academic bodies have put forth the guidelines for rational use of blood in Obstetrics. Health professionals must understand the importance of judicious use of blood.²

This study was aimed to analyse utilization pattern and to identify the indications of transfusion of blood and blood products in obstetrics and to study outcome and management of pregnancy in patients who required blood and/or blood products.

METHODS

After due permission from institutional review board of our institute, this retrospective study was carried out at department of obstetrics of tertiary care teaching hospital for three months (September 2018 to November 2018) and data was collected from hospital records of all patients who had received transfusion of blood and/or blood products for any obstetric cause.

The study population included emergency as well as registered patients and urban as well as rural patients. Patients’ demographic details like age, education, residence, socioeconomic class were collected. Patients’ obstetric history, number of antenatal visits, indications and timing of transfusion (whether antenatal/intranatal/postnatal), management of pregnancy and pregnancy outcome were also noted.

Inclusion criteria

- All patients who were admitted in department of obstetrics which included patients of pregnancy, delivery and post-partum period and required blood and/or blood components.

Exclusion criteria

- All patients who didn't require blood and/or blood products.

Statistical analysis

Data was collected from the case papers and also from records of blood bank. Data was analyzed by appropriate statistical tool.

RESULTS

During the study period, there were total of 2412 admissions in antenatal ward and labour room. Out of these 164 (6.8%) of patients received blood and/or blood products.

Table 1: Socio-demographic details (N = 164).

Socio-demographic details	Number	%
Age (years)		
< 20	4	2.3
21-24	58	35.4
25-30	78	47.6
31-34	17	10.4
35-40	7	4.3
Education		
Illiterate	46	28.1
Primary	67	40.7
Secondary	38	23.2
Higher secondary	8	4.9
Graduate	2	1.1
Postgraduate	3	1.7
Socio-economic class		
Middle	13	7.9
Lower	151	92.1
Residence		
Rural	7	4.3
Urban	157	95.7
Gravidity		
Primi	34	20.7
Multi	130	79.3

As per data collected from the blood bank at our hospital, total 790 units of blood were dispatched during the study period. Out of these maximum units 281 (35.6%) were utilised in the department of obstetrics. Department of paediatrics, medicine, surgery, orthopaedics, plastic surgery, pulmonary medicine and dermatology utilised 140 (17.7%), 137 (17.3%), 120 (15.2%), 56 (7.1%), 51 (6.5%), 4 (0.5%) and 1 (0.1%) respectively.

Table 2: Antenatal visits (N = 164).

Antenatal visits	Number	%
Nil	62	37.8
< 4	64	39.0
> 4	38	23.2

During the study period, total 290 units of fresh frozen plasma (FFP) were utilized. Out of these maximum units were utilised in department of obstetrics, 97 (33.4%). Department of medicine, paediatrics and surgery utilised 75 (25.9%), 52 (17.9%) and 66 (22.8%) respectively.

During the study period, total 613 units of platelet rich concentrate (PRC) were dispatched. Out of these, 131 (21.4%) units were utilized for patients of department of

obstetrics. Department of medicine, paediatrics and surgery utilised 371 (60.5%), 76 (12.4%) and 35 (5.7%) units respectively.

Hence, during the study period, department of obstetrics utilized maximum units of blood and FFP whereas PRC utilisation was second highest.

As shown in Table 1, majority of the patients 78 (47.6%) belonged to the age group of 25-30 years. Primary, secondary, higher secondary, graduate, postgraduate education were attained in 67 (40.7%), 38 (23.2%), 8 (4.9%), 2 (1.1%), 3 (1.7%), respectively and 46 (28.1%) patients were illiterate. Most of the women 151 (92.1%) belonged to lower socio-economical class. Majority of the patients came to hospital were residing in urban areas 157 (95.7%). Among all patients primi, second and multipara were 34 (20.7%), 60 (36.6%), 70 (42.7%) respectively.

As shown in Table 2, there were 62 (37.8%) of patients who came as emergency admissions in the labour room and had not taken any antenatal care, whereas 64 (39.0%) patients had less than 4 antenatal visits. Only 38 (23.2%) patients had more than or equal to 4 antenatal visits.

Table 3: Transfusion period (N = 164).

Transfusion period	Number	%
Antepartum	65	39.6
1 st Trimester	17	10.3
2 nd Trimester	12	7.3
3 rd Trimester	36	22.0
< 37 weeks	3	1.8
> 37 weeks	33	20.2
Intrapartum	33	20.2
Postpartum	66	40.2

As shown in Table 3, 65 (39.6%) patients received blood transfusion during antepartum period and out of these blood transfusions was given during first trimester, second trimester and third trimester in 17 (10.3%), 12 (7.3%) and 36 (22.0%) patients respectively.

In 3rd trimester, majority 33 (20.2%) transfusions were done after 37 weeks of gestation. Intrapartum and postpartum transfusions were given in 33 (20.2%) and 66 (40.2%) patients respectively.

As shown in Table 4, 104 (63.4%) patients of nutritional anaemia who received blood, 5 patients also had gestational hypertension and 2 patients had eclampsia. Transfusion was given in 19 (11.6%) of patients of first trimester complications. Indications of transfusions were incomplete abortion, self-ingestion of abortion pills, ruptured ectopic and complete abortion in 9 (5.5%), 5 (3.1%), 3 (1.8%) and 2 (1.2%) patients respectively.

Table 4: Indication of transfusion (N = 164).

Indication of transfusion	Number	%
Nutritional anaemia (Total)	104	63.4
Anaemia	97	59.1
Anaemia with gestational hypertension	5	3.1
Anaemia with eclampsia	2	1.2
1st Trimester complications (Total)	19	11.6
Incomplete abortion	9	5.5
Self-ingestion of abortion pills	5	3.1
Ruptured ectopic pregnancy	3	1.8
Complete abortion	2	1.2
Obstetric haemorrhage (Total)	28	17.1
Placenta praevia	9	5.5
Placenta praevia with pre-eclampsia	1	0.6
Abruptio placenta	4	2.5
Abruptio placenta with preeclampsia	2	1.2
Placenta accreta	2	1.2
Atonic PPH	10	6.1
DIC (Total)	5	3.1
DIC with HELLP and eclampsia	1	0.6
DIC with Hepatorenal shut down and HELLP	1	0.6
DIC with HEV positive	1	0.6
DIC with septicaemia	1	0.6
DIC with abruptio placenta, IUD, eclampsia	1	0.6
Gestational thrombocytopenia	3	1.8
Dengue	3	1.8
HELLP syndrome (Total)	2	1.2
HELLP with eclampsia (PRESS)	1	0.6
HELLP with eclampsia	1	0.6

Total 28 (17.1%) patients had obstetric haemorrhage, placenta praevia was present in 10 (6.1%) patients, out of these 1 (0.6%) had pre-eclampsia. Abruptio placenta was present in 6 (3.7%) patients, out of these 2 (1.2%) patients had pre-eclampsia also. Placenta accreta was present in 2 (1.2%) patients and 10 (6.1%) patients had atonic PPH.

Other less common indications of transfusion were DIC in 5 (3.1%) patients, gestational thrombocytopenia and dengue in 3 (1.8%) each and HELLP syndrome in 2 (1.2%) patients.

During the study period, vaginal delivery occurred in 65 (39.6%) patients, out of these full-term and pre-term deliveries were 40 (24.4%) and 25 (15.2%) respectively.

LSCS was performed in 53 (32.3%) patients, out of these full-term and pre-term LSCS were 28 (17.1%) and 25 (15.2%) respectively. Out of 121 babies, 113 (93.4%) were live, 8 (6.6%) died in utero, admissions in neonatal intensive care unit (NICU) were 24 and 10 babies expired in neonatal period.

DISCUSSION

In present study, majority of patients 136(83%) were in age group of 21-30 years of age and majority of patients 130 (79.3%) were multigravida. Fazal S et al, have reported majority patients in age group of 20-29 years and almost equal number of primi (49.2%) and multi (50.8%) gravida patients.³

In our study, majority of the patients, 157 (95.7%) who required blood transfusion were from urban areas. Singh S. et al, have reported 53.5% and 46.5% from urban and rural areas respectively.¹ In our study majority of the patients 151 (92.1%) were from lower socio-economical class. Singh et al, have reported 42% and 39% patients from middle and lower socio-economic class.¹

In present study, 62 (37.8%) of the patients were emergency admissions in the labour room, where as 64 (39.0%) patients had less than 4 antenatal visits. Only 38 (23.2%) patients had more or equal 4 antenatal visits which fulfil the World Health Organization's focused antenatal care model criteria.⁴ The study of Madhushree D et al has reported 30.9% of unregistered patients.⁵

In present study, antepartum, intrapartum and postpartum transfusions were 65 (39.6%), 33 (20.2%) and 66 (40.2%) respectively. Hence, peripartum transfusion was 60.4%. Fazal S et al, have reported antepartum and peripartum transfusion in 27% and 73% respectively.³ Madhushree D et al have reported that, antepartum transfusion 161 (78.9%) was more than intrapartum 28 (13.7%) and postpartum 15 (7.3%) transfusions.⁵ In present study, out of 65 antenatal transfusions, almost half of the patients 33 (50.7%) received transfusion in term gestation i.e. > 37 weeks, which corresponds to Kawthalkar A et al, study where majority of patients (41.4%) who received blood transfusion were having > 37 weeks of gestation.⁶

During the study period, out of all departments of our tertiary care hospital, department of obstetrics utilized maximum units of blood and FFP whereas PRC utilization was second highest. Out of 164 patients, 11 patients were given FFP (placenta accreta - 2, Gestational thrombocytopenia - 1, DIC - 5, Dengue - 1, HELLP - 2) and 15 patients were given PRC (placenta accrete - 2, Gestational thrombocytopenia - 2, DIC - 5, Dengue - 3, HELLP- 3).

During the study period, most common indication for blood transfusion was nutritional anaemia in 63.4% of patients. Kawthalkar A et al, Fazal S et al, and Madhushree D et al, have reported 63.8%, 61.6%, and 58.4% patients of nutritional anaemia who required blood transfusion.^{3,5,6} As per National Family Health Survey 4 (NFHS 4), pregnant women who were anaemic in state of Gujarat and India were 51.3% and 50.4% respectively.⁷ Urban- Rural ratio of pregnant women who were anaemic in Gujarat and India was 47.2%-54.2% and 45.8%-52.2% respectively. The percentage of pregnant women who

were anaemic in NFHS-3 data was 60.8% in Gujarat and 57.9% in India. Hence, there has been an improvement in status of anaemia but still we have a long way to go as far as correction of anaemia is concerned and it can be attained by regular ANC along with treatment of malaria and worm infestations, food choices and food preparations so, that iron is absorbed properly. Early diagnosis of anaemia can reduce the need of blood transfusion as early detection of anaemia can be treated with oral or parenteral iron therapy.

In present study, second and third most common indications for transfusion of blood and blood products were obstetric haemorrhage and first trimester complications in 17.1% and 11.6% of patients respectively. Madhushree D et al, Singh S et al and Bangal VB et al have reported 15.2%, 11.8% and 10.2% of patients of first trimester complications who required blood transfusion respectively.^{1,2,5} Bangal VB et al, Singh et al and Madhushree D et al have reported 34.3%, 25.1% and 19.6% of patients who required blood and blood products for obstetric haemorrhage.^{1,2,5} Kawthalkar A et al have reported that transfusion was required in 24.1% and 12.1% of patients of first trimester complications and obstetric haemorrhage respectively.⁶ Adukauskienė et al have reported that major obstetric hemorrhage remains the leading cause of maternal morbidity and mortality worldwide.⁸

In present study, 6.8% of patients received blood and/or blood products. Chowdhury F et al have reported 9.2% of their patients who required transfusion.⁹

In present study, were no transfusion reactions (BTRs) whereas in Madhushree D et al have reported 9 patients out of 204 who suffered from BTRs.⁵

In present study, there was one maternal mortality of a multiparous patient who had delivered at home and developed septicaemia and DIC. In our study out of 121 babies, 114 (93.4%) were live, 8 were IUD and 10 babies expired in neonatal period. Patel VP et al, have reported 53 IUD and 27 neonatal deaths.¹⁰

Single unit blood transfusion, literally has no meaning in obstetrics and thus should be avoided. Similarly, whole blood transfusion should be avoided as much as possible. The treating obstetrician usually decides decision of blood transfusion, its time, type, and quantity. Timely consultation or second opinion from anesthesiologist, intensivist or physician help in correct decision-making regarding type and amount of blood to be replaced.²

CONCLUSION

Three most common indications for transfusion were nutritional anaemia, obstetric haemorrhage and first trimester complications. Majority of patients had inadequate or no antenatal care. Counselling and prevention of anaemia since adolescence can reduce the prevalence of anaemia in women who become pregnant

later. Early and regular ante natal care, early diagnosis of anaemia and its management, early diagnosis and management of high-risk pregnancies and obstetric complications, institutional delivery, active management of third stage of labour can reduce the rate of transfusion of blood and blood products. There are risks involved in transfusion. Hence, judicious and optimum use of blood and blood products is recommended.

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