

Original Research Article

TRANSFUSION OF BLOOD AND BLOOD PRODUCTS IN OBSTETRICS AT A TERTIARY CARE HOSPITAL: A PROSPECTIVE OBSERVATIONAL STUDY

¹Stuti Shah, ²Shlok Patel, ³Dr. Rina Patel, ⁴Dr. Anshum Patel, ⁵Karan Jayesh Shah, ⁶Rahil Patel, ⁷Karan Hiren Shah

^{1,2,5}Final year M.B.B.S Student, B.J Medical College, Ahmedabad, Gujarat, India

³Associate Professor of Obstetrics and Gynecology, N.H.L Municipal Medical College (SVPIMSR), Ahmedabad, Gujarat, India

⁴AMC MET Medical College, Ahmedabad, Gujarat, India

^{6,7}Intern, Pacific Institute of Medical Sciences, Udaipur, Rajasthan, India

Corresponding Author:

Dr. Rina Viral Patel (rinaviral1975@gmail.com)

Abstract

Background: Anemia and obstetric haemorrhage are major causes of maternal mortality. Both of those are the commonest indications requiring blood and component transfusion. Blood transfusion is a crucial component of comprehensive emergency obstetric care. This study was aimed to explore indications for blood and blood component transfusion in obstetrics.

Methods: This prospective observational study was carried out from January 2022 to June 2022 at a tertiary care hospital in Department of Obstetrics and Gynecology. Data was gathered from all patients who underwent transfusion of blood and/or blood products for any obstetric issue.

Results: During the study period, total 200 patients were transfused with blood and/or blood components. Two most common indications for blood transfusion were obstetric haemorrhage (64.5%) and anemia (43%). 180 patients were given PCV (90%), 80 patients received FFP (40%), 86 received PRC (43%) and 12 received cryoprecipitate (6%).

Conclusion: Maintaining a proper transfusion schedule, keeping transfusion minimum and, only using when absolutely indicated, may make blood transfusion safer and more effective. Awareness about blood donation should be increased.

Keywords: Transfusion of blood, Anemia and obstetric haemorrhage, blood donation, maternal mortality

Introduction

Maternal mortality is considered a key health indicator. The direct causes of maternal deaths are well known, largely preventable, and easily treatable. Blood transfusion is a crucial component of comprehensive emergency obstetric care ^[1]. Anemia and obstetric haemorrhage are major causes of maternal mortality. Both of those are the commonest indications requiring

blood and component transfusion. In India, prevalence of anemia is around 65-75% [2].

Massive (2000 ml or more) and life-threatening obstetric haemorrhage occurs in 3-5% C-sections and 0.1% vaginal deliveries respectively, and blood product transfusion is necessary in 0.3-1% patients [3, 4]. The overall blood transfusion rate for primary post-partum haemorrhage was 0.31%. The rate of blood transfusion in patients who had a C-section during labour was 0.49%, whereas in women who had a vaginal delivery or elective Caesarean section it was 0.28% and 0.23%, respectively [3].

Currently, it is possible to segregate the blood into specific components which are indicated for a particular situation. Lately, most of the hospitals have employed the usage of components and thus whole blood is not available easily. Massive transfusion protocol in case of massive haemorrhage necessitates a ratio of 1:1:1 of Red blood cells, FFP (fresh frozen plasma)/cryoprecipitate and platelet units respectively [5].

Obstetric conditions like anemia, post-partum hemorrhage (PPH), placenta previa, abruptio placentae, placenta accreta, and thrombocytopenia frequently require transfusion of blood and blood components. Transfusion rate in obstetrics varies from 0.16 to 2-6% [6]. Blood transfusion always carries a risk of transfusion associated reactions and infection. So, rational and safe usage of blood and its components, prevents transmission of infections and scarcity of blood.

This study was aimed to analyze indications for blood and component transfusion in obstetrics.

Materials and Methods

A prospective observational study was carried out from January 2022 to June 2022 at a tertiary care hospital in the Department of Obstetrics and Gynecology.

Study design: This is a hospital based prospective observational study. Patient who were given blood and blood component transfusion fulfilling following case selection criteria were included.

Inclusion criteria: All antenatal patients in their third trimester admitted in our institute who require blood or blood component transfusion.

Exclusion criteria: Patients with early pregnancy haemorrhage like abortion, ectopic pregnancy, hydatidiform mole, etc.

Detailed history and examination of patients was carried out. Patients were transfused with blood and/or blood products according to clinical evaluation and laboratory parameters.

Results

During the study period, a total of 200 patients were transfused with blood and/or blood components.

Table 1: Socio-demographic characteristics (N=200)

Characteristics	Number (%)
a) Age (years)	
<20	4 (2%)
20-24	67 (33.5%)
25-29	78 (39%)
30-34	36 (18%)
>34	15 (15%)
b) Gravidity	
Primi	65 (32.5%)
Multi	135 (67.5%)

c) Residence	
Urban	144 (72%)
Rural	56 (28%)
d) Socioeconomic Class	
Lower	128 (64%)
Middle	50 (25%)
Upper	22 (11%)
e) Patient Status	
Emergency	115 (57.5%)
Booked/Registered	85 (42.5%)

As per Table-1, the majority of patients belong to the age group of 25-30 years (39%). Amongst all patients, 65 (32.5%) were primigravida, whereas 135 (67.5%) were multigravida. 144 patients (72%) were from urban area and 56 (28%) from rural area. In our study, majority 128 (64%) patients were from lower socioeconomic class and the remaining 36% belonged to middle and upper class.

Table-1 shows that 85 patients were registered and undergoing antenatal care, whereas 115 patients were un-booked or referred.

Table 2: Blood Transfusion according to obstetric conditions

Obstetric condition	Blood transfusion
(1) Anemia	86
(2) Uterine atony	38
(3) Genital tract injuries including uterine rupture	10
(4) Placental Abruption	43
(5) Placenta Previa	36
(6) Thrombocytopenia	78
(7) Disseminated intravascular coagulation (DIC)	54

(8) Placenta accreta	2
(9) Jaundice	8
(10) HELLP syndrome	3

In Table 2, one patient may have more than one complication simultaneously, so the total number maybe more than 200. The maximum number of patients that received blood or blood products had obstetric haemorrhage. Amongst them, some were having other associated obstetric conditions alongside.

Anemia, antepartum haemorrhage, post-partum haemorrhage, and thrombocytopenia are a major group of obstetric emergencies which require blood and blood components. Disseminated intravascular coagulation (DIC) and thrombocytopenia are the conditions which require transfusion of components.

Table 3: Distribution of patients according to number of units of blood component given.

Blood components	PCV (packed cell volume)				FFP		Platelet rich concentrates(PRC)		Cryoprecipitate	
	0	1-3	4-5	>5	1-4	>4	1-4	>4	1-4	>4
Patients	20	133	42	5	61	19	52	34	09	03

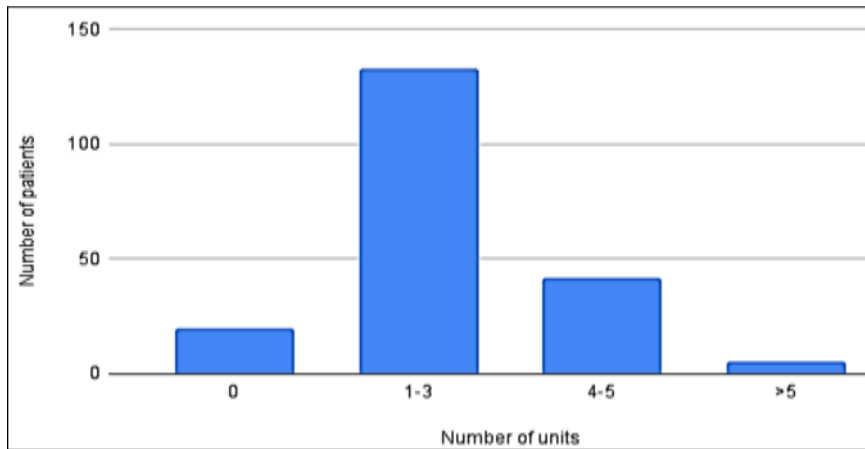


Fig 1: Packed cell volume

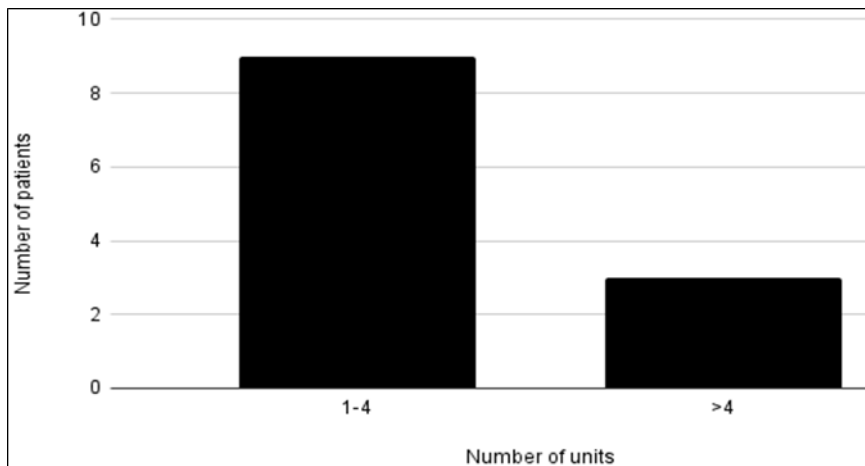
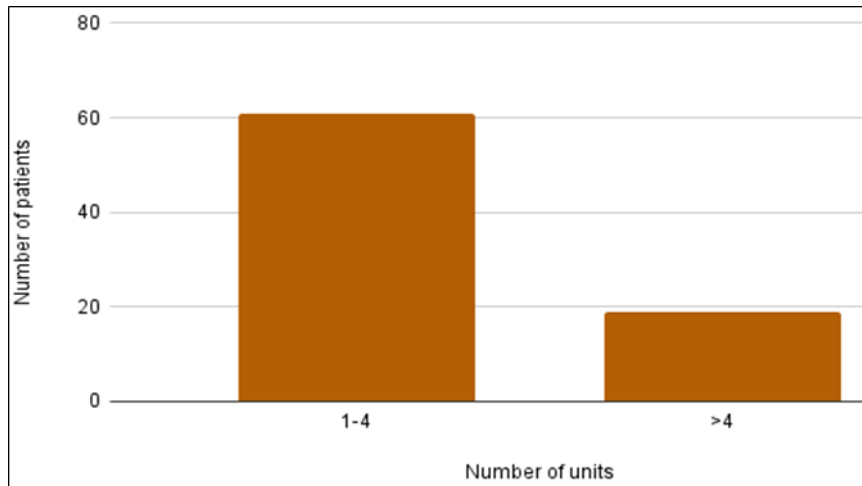
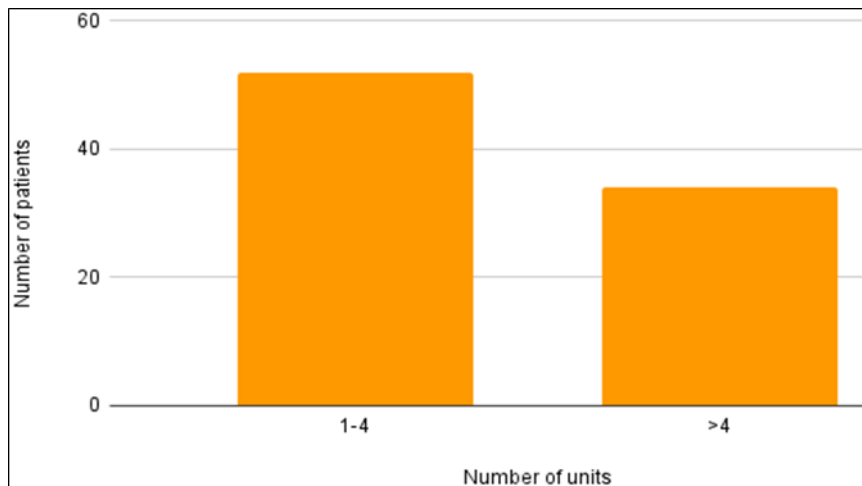


Fig 2: Cryoprecipitate**Fig 3: FFP****Fig 4: PRC**

Total 180 patients required 1-5 units of PCV transfusion (table 3), for which anemia and haemorrhage were major causes. Out of 200 patients, 5 were given >5 units of PCV and other components, as these were the cases with severe anemia and massive post-partum haemorrhage. Multiple units of blood and its components in such cases, replace blood volume and improve oxygen carrying capacity.

In 20 patients, only platelet transfusion was given, as those were the cases of thrombocytopenia only. In our study, total 80 patients were transfused with FFP. Amongst them, 61 patients required 1-4 units of FFP, whereas 19 patients required >4 units. FFP transfusion was given to patients of DIC, Abruptio placentae, and HELLP syndrome. Majority of them had altered coagulation profile. Some patients with normal coagulation profile were also given FFP to prevent complications and dilutional coagulopathy.

In our study, a total of 86 patients required PRC transfusion due to thrombocytopenia, DIC, jaundice, and placental abruption. A total of 12 patients were transfused with cryoprecipitate due to DIC and placental abruption with altered coagulation profile. Cryoprecipitate was transfused in cases of massive obstetric haemorrhage with risk of cardiac overload and severe anemia.

Discussion

Blood transfusion is an important and indispensable part of obstetric patient management. It has a pivotal role in reducing maternal morbidity and mortality. This, however, doesn't come without risks. Despite proper blood screening, there is still a considerable risk of transfusion transmitted infections like HIV, Hepatitis B, Hepatitis C, etc. Therefore, ensuring blood safety is of equal importance. Globally, around 150,000 pregnancy associated deaths can be prevented each year if women have access to safe blood and proper blood transfusion facilities [7, 8].

In the present study, the majority of patients 145 (72.5%) were in the age group of 21-30 years and the majority of patients were multigravida 135 (67.5%). This can be compared with the study done by Vasava *et al.*, which reports 83% patients in the age group of 21-30 and 79.3% multigravida patients [9]. Another study, done by Fazal *et al.*, showed a majority number of patients in 21-30 age group and almost equal primigravida and multigravida patients [10].

In our study, 115 patients requiring blood transfusion were emergency cases and the rest 85 were registered. This data can be validated with Chowdhury F *et al.*, (2016) study [11], which shows 47% registered cases and 53% non-booked cases. The regular antenatal care coupled with education regarding proper diet intake, iron supplementation, and routine follow-up led to a slightly lower requirement of blood products in registered patients in our study.

In the present study, the most common indication for blood transfusion is obstetric haemorrhage (64.5%). Vasava *et al.*, reported that almost 17% of transfusion patients suffered from obstetric haemorrhage [9]. Madhushree D, *et al.*, and Bangal VB *et al.*, reported that 19.6% and 34.3% of the patients requiring transfusion had obstetric haemorrhage [12, 13]. Our tertiary care referral center has higher rates of transfusion in obstetric haemorrhage compared to other studies. This may be due to increased referred cases or due to inadequate prenatal care in the COVID-19 era.

Our study identified anemia (43%) as the second most common indication of blood transfusion. The most common causes of maternal mortality are anemia and obstetric hemorrhage. Sixty-five percent of women in Gujarat have anaemia. Anaemia is specifically high among rural women and tribe women. Anaemia in women has increased by 10% if compared with NFHS-4 [14]. In our study, majority of transfusion patients were from lower socio-economic class.

In our study, total 80 patients were given FFP. Amongst them, 61 patients required 1-4 units of FFP, whereas 19 patients needed >4 units. FFP transfusion was given to patients of DIC, Abruptio placentae, and HELLP syndrome. A total of 86 patients required PRC transfusion due to thrombocytopenia, DIC, jaundice, and placental abruption. A total of 12 patients were transfused with cryoprecipitate due to DIC and placental abruption with altered coagulation profile. In a study done by Vasava *et al.*, of 164 patients, 11 patients were transfused with FFP (placenta accreta-2, Gestational thrombocytopenia-1, DIC-5, Dengue-1, HELLP-2) and 15 patients were given PRC (placenta accreta-2, Gestational thrombocytopenia-2, DIC-5, Dengue-3, HELLP-3) [9]. Our study validated the usage of component transfusion in patients with DIC and altered coagulation profile.

Both single unit and whole blood transfusion are meaningless and should be avoided in obstetrics. It is up to the obstetrician to decide the time, type and quantity of blood transfusion [9].

Conclusion

Antenatal mothers with high risk factors should be promptly identified and referred to a health care institute where experienced obstetricians, operative facilities and well-equipped blood banks are available. The blood component therapy should be given by correlating clinical condition and pathological investigations.

Maintaining a proper transfusion schedule and keeping transfusion minimum and only using when absolutely indicated, may make blood transfusion safer and should be employed in clinical practice. As blood and its products are important to save lives in many serious conditions, awareness about blood donation should be increased at all available levels with all possible efforts.

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