

# Factors Related to Blood Transfusion in Placenta Previa

Rumina Tabassum, Shazia Shukaruddin, Uzma Nusrat

## ABSTRACT

- Objective** To determine the frequency of blood transfusions in cases of placenta previa and to assess the factors influencing such a need.
- Study design** Descriptive case series.
- Place & Duration of study** Department of Obstetrics and Gynecology, Civil Hospital Karachi, from January 2009 to December 2010.
- Methodology** Clinical records of 88 cases of placenta previa were retrieved. Ten cases of placenta previa with multiple gestation, adherent placentae, placental abruption, maternal death on arrival and incomplete records were excluded. Seventy-eight cases were selected for the study. Structured proforma was used to collect information about transfusion of blood and blood products and the factors affecting need for transfusion.
- Results** The mean age of the patients was 28.37±4.74 year; parity was between 2 to 4 in 34(44%) patients and 26 (34%) of the total cases were booked. A total of 177 (mean 2.3) transfusions were received by 59 (76.6%) patients. Seventy-five (97.6%) patients had anemia including 8(10.4%) cases of severe type. Patients aged below 25 or above 34 year, of un-booked status and parity below 2 or above 4, received more transfusions. Complete placenta previa, severity of anemia and signs of shock were significant determinants for transfusion. Majority of blood transfusions were given during the delivery or cesarean section.
- Conclusion** Pregnant woman with major placenta previa who presented with hemorrhage and already anemic, needed more replacement of blood.
- Key words** Placenta previa, Blood transfusion, Anemia.

## INTRODUCTION:

Placenta previa is defined as complete or partial implantation of the placenta in the lower segment of the uterus.<sup>1</sup> It is thought to result from previous inflammation or scarring in the endometrial tissue, leading to endometrial atrophy.<sup>2</sup> Patients present with bleeding per vaginum occurring usually in the second and third trimester.<sup>3</sup> The bleeding is generally mild but can be severe and life-threatening. The incidence across the globe is approximately 3-5 per 1000 pregnancies.<sup>4</sup> This condition may lead to massive blood loss that requires urgent blood transfusion. Various studies have highlighted the important factors contributing to worse outcome of

this manageable condition. One study revealed that history of cesarean section, advanced maternal age and placenta previa lead to massive blood loss (exceeding 2.5 liters).<sup>5</sup> Another study emphasized the role of complete placenta previa in increasing the likelihood of blood transfusion.<sup>2</sup> The rate of blood transfusion increases from 2.3 % in normal pregnancies to 15 % in cases of placenta previa.<sup>6</sup> Another study conducted in Lebanon showed that the cases of placenta previa had a longer hospital stay, a higher estimated blood loss and consequently, a greater need of blood transfusions as compared to the controls.<sup>7</sup>

Bleeding in placenta previa is associated with maternal morbidity and mortality. Indeed, both at hospital and community level, hemorrhage is the most common cause of maternal mortality in Pakistan.<sup>8</sup> In the developing countries, due to lack of antenatal care, this problem poses a greater threat

## Correspondence:

Dr. Rumina Tabassum  
Department of Obstetrics & Gynecology  
Dow International Medical College, Karachi  
E mail:dr.rumina.tabassum@duhs.edu.pk

not only to the mothers but also to the fetal life.<sup>4</sup> The aim of this study was to analyze relevant data on blood transfusion among patients with placenta previa.

#### METHODOLOGY:

This study was conducted in the Department of Obstetrics and Gynecology, Civil Hospital Karachi, from January 2009 to December 2010. A total of 78 records of patients with placenta previa were reviewed. Placenta previa was defined as: after 28 weeks of pregnancy the placenta partially or completely lying in the lower uterine segment. The diagnosis of placenta previa was made by clinical features and abdominal or trans-vaginal ultrasound. The condition was confirmed by intra operative observation of placental localization.

A structured performa was used to collect information. In this study anemia was assessed through maternal hemoglobin levels and categorized as no anemic when hemoglobin (Hb) was equal to or greater than 11.5gm%, whereas anemia was classified as mild (Hb 11.4 gm - 8.0 gm%) moderate (7.9 – 6 gm%), and severe (Hb below 6 gm%). The age was stratified into < 25 year, between 25 and 34 year, > 34 year. Parity was classified as primipara, between 2 to 4 and 5 or more pregnancies. Women were considered booked when they had at least two visits and non- booked if they had single or no visit to Civil Hospital Karachi. Type of placenta previa was defined; minor when it did not cover the internal os and major when it covers the internal os of the cervical canal.

The necessity of transfusion was decided by the obstetrician or anesthetist after the clinical examination based upon anemia, blood pressure, pulse and the amount of hemorrhage. The factors influencing this necessity were also considered like maternal age, parity, booking status, type of placenta previa, anemia and shock.

Data analysis was performed on SPSS version 15.0. The variables were categorized as discrete and continuous. Frequencies and mean were calculated for continuous variables and proportions were reported for discrete variables. Chi square or Fisher's Exact Test was applied where appropriate and p value of < 0.05 was considered significant.

#### RESULTS:

During the study period of 14 months, a total of 2853 women were admitted in labor room including 78 (2.73%) cases of placenta previa. The mean age was  $28.37 \pm 4.74$  year. Table I describes the demographic characteristics of patients and their effect on transfusion. Majority of patients between 25 to 34 year received less number of average transfusions (n=2.03) as compared to those in the age groups of < 25 year (n=3.2) and > 34 year (n=2.5).

Out of total, 34 (44.2 %) patients had parity between 2 to 4. On evaluation of booking status, 26 (33.8 %) of the total subjects, were booked. These cases received the least average number of transfusions (n=1.81), in stark contrast to the un-booked cases where this figure was 2.97.

**Table I: Demographic Characteristics of Study Participants and Transfusions Received**

Variable	No. (%)	Transfusions Received		Mean Transfusions(n)	Volume (Liters)
		No. of Cases (%)	Units (n)		
Age					
<25 year	13 (16.9)	11 (84.6)	42	3.2	21
25-34 year	55 (70.1)	40 (74.1)	110	2.03	55
>34 year	10 (13)	8 (80)	25	2.5	12.5
Parity					
1	18 (22.1)	13 (76.5)	42	2.47	21
2-4	34 (44.2)	26 (76.5)	68	2	34
>4	26 (33.7)	20 (76.9)	66	2.54	33
Booking Satus					
Booked	26 (33.8)	19 (73.1)	47	1.81	23.5
Un-booked	34 (44.2)	28 (82.4)	101	2.97	505
Referred	18 (22)	12 (70.6)	29	2.4	13

Table II shows that average pints of blood transfused in 58(75%) patients with major placenta previa were 2.6 as compared to 1.4 in 19 (25%) cases with minor placenta previa. This is significant as p-value is 0.00. Direct proportionality was observed between the clinical severity of anemia and mean number of transfusions received by the patients. With increasing anemia women with placenta previa need more blood transfusions both in average unit and in liters (p-value =0.02). Table III shows that 59 (76.6%) cases received a total of 177 units of whole blood, out of these 54 (91.5%) had intraoperative transfusion of 140 units (70 litres).

**DISCUSSION:**

Placenta previa is associated with antenatal bleeding and maternal morbidity. This study reflects the necessity of transfusion(s) in cases of placenta previa. Studies conducted in the past have

enumerated several risk factors prompting the need of blood transfusion. These include increased maternal age, elevated BMI, low and high birth weights, multigravida, low hematocrit and previous history of cesarean section(s), dilatation and evacuation and placenta previa.<sup>4,7</sup>

In this study majority of patients (76.6%) received transfusion. This is in contrast to the studies from developed countries and the developing countries. A study from Nigeria reported that the necessity of transfusion was felt in 59.1 % cases of placenta previa,<sup>9</sup> while that from Japan concluded the need to be 33.3%.<sup>5</sup> A study from United States identified that amongst women undergoing cesarean section, placenta previa increased the transfusion requirement by 4.5 times,<sup>10</sup> while another study from Japan reported a 6.5 fold increased risk for transfusion in women with placenta previa.<sup>6</sup> Several

Variable	No of Cases	Transfusions Received			Volume (liters)	P. value
		No. of Cases (%)	Units (n)	Mean (n)		
<b>Mode of delivery</b>						
Cesarean section	59 (76.6)	45 (76.3)	128	1.00	640	1.00
Vaginal delivery	18 (23.4)	14 (77.8)	48		24	
<b>Type of placenta previa</b>						
Minor	19 (24.7)	5 (2.31)	15	0.00	7.5	0.00
Major	58 (75.3)	54(93.10)	162		81.0	
<b>State of shock</b>						
Yes	11(12.99)	10 (100)	45	4.5	22.5	0.00
No	67(87.01)	49 (73.13)	132	2	66.0	
<b>Hemoglobin (gm%)</b>						
> 8	46(59.7)	31 (67.4)	69	1.5	34.5	0.002
< 8	31(40.3)	30 (96.78)	108	3.5	54.0	

Variable	No. of Cases (%)	Total Number of Transfusions	Mean Number of Transfusions	Volume (liters)
Whole blood	59 (76.6)	177	03	88.5
Fresh Frozen plasma	7 (9.1)	16	2.3	0.16
Pre-operative/ pre delivery	5 (27.8)	20	04	10
Intra operative/ intra partum	54 (91.5)	140	2.9	70
Post operative/ post partum	7(11.86)	17	2.4	8.5

factors account for such a high frequency of transfusions in our study. Pre-operative anemia has been deduced as markedly increasing the transfusion needs.<sup>10</sup>

In our study one third of cases had hemoglobin values less than 8 gm/dl at the time of presentation. A large multivariate analysis conducted in Israel showed that anemia is significantly associated with placenta previa.<sup>11</sup> However, the frequency of anemic patients in our study was greater as compared to other studies and it might be one of the factors increasing the need of transfusion. A study from Pakistan showed that anemia was prevalent in almost half of the pregnant women.<sup>12</sup> Anemia was present in one-fourth (24.48%) of maternal deaths in an Indian study.<sup>13</sup> Our findings are imperative because a number of studies have reported that maternal anemia during gestation is associated with a poor pregnancy outcomes.<sup>14,15</sup>

Our study showed that maternal age below 25 or above 34 year, affect the number and hence the volume of transfusions received. Oya A et al reported that increasing age is associated with increased need of peripartum transfusion in patients of placenta previa.<sup>2</sup> Furthermore, an age greater than 35 year has been described as an independent risk factor of blood loss during pregnancy even after adjusting for placenta previa and other risk factors.<sup>16</sup> The women who were booked had slightly less frequency of necessity of transfusion compared to those who were un-booked. However, the number of transfusions received by the non-booked cases was significantly higher and almost twice compared to those who were booked (mean number of transfusions in un-booked cases was 2.97 compared to 1.56). This is related to better antenatal care in the booked cases as has been depicted in a study.<sup>4</sup> The finding that un-booked cases require greater number of transfusions is crucial considering prompt need to correct the circulation status of patient presenting at the emergency department. The number of un-booked cases in our study (44.15%) was greater not only compared to the developed world but also with certain developing countries. For instance, an African study reported that among cases with placenta previa, 11% did not attend antenatal clinics.<sup>4</sup>

Cesarean sections for the pregnancies complicated by placenta previa significantly ( $p=.0002$ ) increases the need of transfusion.<sup>17</sup> In present study, mean transfusions received was 2.2 for the women who underwent cesarean section and was 2.7 who had vaginal delivery. Major placenta previa was more in frequency (approximately three-fourths) of the total

in our study which is in different from other reported series. A study conducted in Croatia reported that two thirds of the patients had minor placenta previa.<sup>18</sup> One of the crucial findings in our study was that major placenta previa was associated with a significantly greater necessity of transfusions compared to the cases with minor placenta previa as also reported in literature.<sup>19</sup>

This study had limitations of being retrospective and small sample size. Furthermore it was conducted in public sector hospital where cases are mostly from low socioeconomic class with lack of antenatal care, unbooked and referred cases. This can bias the analysis of data.

#### CONCLUSION:

Major placenta previa, anemia, extremes of age, increasing parity and non- booked status were associated with greater number of transfusions.

#### REFERENCES:

1. Lala ABH, Rutherford JM. Massive or recurrent antepartum haemorrhage. *Current Obstet Gynaecol.* 2002;12:226–30.
2. Oya A, Nakai A, Miyake H, Kawabata I, Takeshita T. Risk factors for peripartum blood transfusion in women with placenta previa: a retrospective analysis. *J Nippon Med Sch.* 2008;75:146-51.
3. Ko, P, Dyne PL. Placenta previa in emergency medicine. [Internet] available from URL [emedicine.medscape.com/article/796182-overview](http://emedicine.medscape.com/article/796182-overview) accessed on August 2012.
4. Kiondo P, Wandabwa J, Doyle P. Risk factors for placenta praevia presenting with severe vaginal bleeding in Mulago hospital, Kampala, Uganda. *Afr Health Sci.* 2008; 8:44-9.
5. Hasegawa J, Matsuoka R, Ichizuka K. Predisposing factors for massive hemorrhage during cesarean section in patients with placenta previa. *Ultrasound Obstet Gynecol.* 2009;34:80-4.
6. Takayama T, Minikami H, Koike T, Watanabe T, Sato I. Risks associated with cesarean sections in women with placenta previa. *J Obstet Gynecol.* 2006;107:927-41.
7. Usta IM, Hobeika EM, Musa AA, Gabriel GE,

- Nassar AH. Placenta previa-accreta: risk factors and complications. *Am J Obstet Gynecol.* 2005;193:1045-9.
8. Jaffery SN. Maternal mortality in Pakistan-complication of available data. *J Pak Med Assoc.* 2002;52:539-44.
9. Ozumba BC, Ezegwui HU. Blood transfusion and caesarean section in a developing country. *J Obstet Gynaecol.* 2006;26:746-8.
10. Rouse DJ, MacPherson C. Blood transfusion and cesarean delivery. *Obstet Gynecol.* 2006;108:891-7.
11. Levy A, Fraser D, Katz M, Mazor M, Sheiner E. Maternal anemia during pregnancy is an independent risk factor for low birth weight and preterm delivery. *Eur J Obstet Gynecol Reprod Biol.* 2005;122:182-6.
12. Lone FW, Qureshi RN, Emmanuel F. Maternal anaemia and its impact on perinatal outcome in a tertiary care hospital in Pakistan. *East Mediterr Health J.* 2004;10:801-7.
13. Jain A, Gupta SC, Misra SK, Bhagoliwal AK, Kaushal SK. Trend and causes of maternal mortality among women delivering in S. N. Medical College Hospital, Agra. *Indian J Public Health.* 2009 53:47-8.
14. Scholl TO, Reilly T. Anemia, iron and pregnancy outcome. *J Nutr.* 2000;130:443S-447S.
15. Klebanoff MA, Shiono PH, Selby JV, Trachtenberg AI, Graubard BI. Anemia and spontaneous preterm birth. *Am J Obstet Gynecol.* 1991;164:59-63.
16. Ohkuchi A, Onagawa T, Usui R. Effect of maternal age on blood loss during parturition: a retrospective multivariate analysis of 10,053 cases. *J Perinat Med.* 2003;31:209-15.
17. Imarengiaye CO, Ande AB. Risk factors for blood transfusion during c-section in a tertiary hospital in Nigeria. *Med Sci Monit.* 2006;12:269-72.
18. Tuzovic L. Complete versus incomplete placenta previa and obstetric outcome. *Int J Gynaecol Obstet.* 2006;93:110-7.
19. Bahar A, Abusham A, Eskandar M, Sobande A, Alsunaidi M. Risk factors and pregnancy outcome in different types of placenta previa. *J Obstet Gynaecol Can.* 2009;31:126-31.