

Original Research Article

Prospective observational study of risk factors and maternofetal outcome of placenta previa at LMICs

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ABSTRACT

Background: This study was conducted to assess incidence, risk factors, maternal and fetal outcome in patients of placenta previa (PP).

Methods: Department of Obstetrics and Gynecology, King George Medical University, Lucknow. Hospital based prospective observational study. Patients attending to the antenatal outdoor patient unit with diagnosis of PP and patients coming to emergency with the complaints of antepartum hemorrhage (APH) because of placenta previa. Detailed history, clinical examination, imaging by transabdominal ultrasound, antenatal complications, per-operative findings, maternal and fetal outcome were assessed. Qualitative variables were compared using Chi square test/Fisher's exact test as appropriate. Statistical analysis was done using SPSS version 21.

Results: Incidence of PP was 2.8% (271/9404). Mean age was 28.23±4.58 years. 37.3%, delivered between 28-33.6 weeks. 229 (84.5%) had emergency LSCS. 205 (75.6%) cases of placenta previa had active bleeding. 53 (19.6%) cases had PPH and 2 maternal mortalities occurred due to hemorrhagic shock.

Conclusions: Placenta previa is associated with definitely poor maternal and fetal outcome which can be better managed with multidisciplinary team work.

Keywords: Antepartum hemorrhage, Low lying placenta, Morbid adherent placenta, Placenta previa

INTRODUCTION

Placenta previa is one of the most important causes of antepartum hemorrhage (APH) in pregnancy. In many cases it is associated with poor maternal outcomes especially because of massive antepartum haemorrhage and postpartum haemorrhage (PPH). Fetal outcomes are poor mainly because of preterm deliveries. With the increased use of ultrasound in modern era in 2nd and 3rd trimester diagnosis of placenta previa is made earlier and they are managed with all preparations beforehand in most of the cases. But still most of the women land up in emergency with hemorrhagic shock or with active bleeding in our low resource setting without a prior

diagnosis because of lack of screening and quality emergency obstetric care. According to National Hospital Surveillance from USA, case fatality rate of 17.3 deaths per 1,00,000 is noted which is very low in comparison to low income group countries.¹ Placenta previa is defined as a placenta that implants at or over the cervical os, and it occurs in approximately 0.3-0.5% of pregnancies at delivery.² If internal os is covered partially or completely by placenta, this is known as placenta previa. If placenta is in the lower uterine segment and placental edge to os distance is 1-20 mm, it is called low lying placenta. There are some known risk factors for placenta previa such as multiparity, previous caesarean section, history of dilatation and curettage, myomectomy.³ Also, we are aware that placenta previa is associated with increased

maternofetal morbidity and mortality but there is paucity of data related to exact incidence, risk factors, maternal and fetal complications due to placenta previa from India, hence this study was planned.

Aim: To assess incidence, risk factors, maternal and fetal outcome in patients of placenta previa.

METHODS

This is a hospital based prospective observational study conducted at Queen Mary Hospital in the Department of Obstetrics and Gynecology, KGMU, Lucknow from January 2017 to May 2018.

Inclusion criteria

Patients attending to the antenatal outdoor patients with diagnosis of placenta previa and patients coming to emergency with the complaints of antepartum hemorrhage (APH) because of placenta previa were included in the study.

Exclusion criteria

APH because of other causes were excluded from the study.

Since it was single centre prospective observational study so all patients who had placenta previa in study duration of one and half year were included in the study. Ethical considerations were followed according to declaration of Helsinki of 1975, as revised in 2013, concerning human and animal rights.

Detailed history, clinical examination, imaging by transabdominal ultrasound, antenatal complications, per-operative findings, maternal and fetal outcome were

assessed. Information on age, parity, abortions, prior uterine surgeries (caesarean section, myomectomy, curettage with or without hysteroscopy), number of caesarean sections, history of placenta previa, first episode of PPH, total number of days of conservative management were collected and analysed. Maternal outcome parameters were comorbid abnormal adherent placentation (placenta accreta, increta or percreta), antepartum bleeding, post-partum hemorrhage of more than 1000 ml, anemia, and intra or postpartum hysterectomy. Fetal parameters were studied in terms of congenital malformations, fetal malpresentation, intrauterine growth restriction, gestational age at delivery, birth-weight, intrauterine death, Apgar-scores at five minutes and neonatal mortality. Categorical variables were presented in number and percentage (%) and continuous variables were presented as mean±SD and median. Qualitative variables were compared using Chi square test/Fisher's exact test as appropriate. A p value of <0.05 was considered statistically significant. Statistical analysis was done using SPSS version 21.

RESULTS

In study period from January 2017 to May 2018, 9404 patients delivered at our hospital, out of which 590 had antepartum hemorrhage. 315 had APH because of abruption, 4 had local cause and rest 217 had placenta previa. 54 patients were diagnosed as placenta previa on routine ultrasonography. So total number of patients with placenta previa in study period were 271 and incidence was 2.8%. Maximum number of patients in the study with placenta previa were in the age group of 26-30 years (42.8%) followed by women in the age group of 20-25 years (33.6%) Mean age of patients was 28.23±4.58 years. On applying chi square test, p value=0.026, shows statistically significant association of age with placenta previa (Table 1).

Table 1: Distribution of cases according to age and association of age with placenta previa.

		Placenta previa					Total
		Previa	Low lying	Accreta	Increta	Percreta	
Age intervals	20 to 25	76	11	3	1	0	91
		33.8%	39.3%	27.3%	50.0%	0.0%	33.6%
	26 to 30	98	13	3	1	1	116
		43.6%	46.4%	27.3%	50.0%	20.0%	42.8%
	31 to 35	37	4	4	0	2	47
		16.4%	14.3%	36.4%	0.0%	40.0%	17.3%
	36 to 40	12	0	0	0	2	14
		5.3%	0.0%	0.0%	0.0%	40.0%	5.2%
	41 to 45	2	0	1	0	0	3
		0.9%	0.0%	9.1%	0.0%	0.0%	1.1%
Total		225	28	11	2	5	271
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

On analysis of gestational age for delivery, it was found that maximum number of patients, i.e. 101/271 (37.3%), delivered between 28-33.6 weeks. However, 77 patients (28.4%) had term delivery (Table 2).

Table 2: Distribution according to the gestational age at delivery.

Gestational age category	N	Percent
<28	20	7.4
28 to 33.6	101	37.3
34 to 36.6	73	26.9
>36.6	77	28.4
Total	271	100.0

In our study majority of the patients were third gravida (29.9%), 24.7% were second gravida and 20.7% were primigravida. 185 patients (68.5%) did not have any risk factor. 56 patients had previous one caesarean, 13 patients had previous two caesarean and 7 patients had previous three caesareans. 7 patients had D and C history and 3 patients had D and C history along with myomectomy (Table 3).

Table 3: Risk factors related to placenta previa.

Previous LSCS	N	Percent
No risk factors	185	68.5
One LSCS	56	20.6
Two LSCS	13	4.7
Three LSCS	7	2.5
1 (D and C)	7	2.5
1 (D and C, myomectomy)	3	1.1
Total	271	100.0

Table 4: Distribution according to ultrasound findings.

Placental position	Number	Percentage (n=271)
Anterior	97	34.6
Posterior	128	47.2
Anterior low lying	22	8.1
Posterior low lying	6	2.6
Placenta accreta	11	4.1
Placenta increta	2	0.7
Placenta percreta	5	1.9

Out of total 271 cases, no warning bleed was seen in 13 cases till term. 10 cases could be conserved only for 1 week after episode of APH, 8 cases could be conserved up to two weeks, 6 cases were conserved up to three weeks, only 5 cases conserved for one month and only one case could be conserved up to seven weeks. Astonishingly 7 cases had preterm premature rupture of membrane along with placenta previa. Out of 271 cases, 225 were placenta previa, 28 had low lying placenta, 18 had morbid adherent placenta (Table 4). 63 (23%) patients came into hemorrhagic shock, 41 (15.1%) patients presented with severe anemia, 33 cases (12.1%) presented with moderate anemia and 49 (18%) had mild anemia.

Out of 271, 36 (13.3%) women underwent elective LSCS and 229 (84.5%) had emergency LSCS, 6 delivered vaginally. Amongst these cesarean deliveries 97 (36.6%) women needed general anesthesia whereas maximum got operated under spinal anesthesia 168 (63.4%). Major indication for emergency LSCS was active bleeding (205) followed by acute fetal distress (24).

Table 5: Association of PPH with placenta previa.

		Placenta previa					
		Placenta previa	Low lying	Accreta	Increta	Percreta	Total
PPH	Yes	38	3	7	1	4	53
		16.9%	10.7%	63.6%	50.0%	80.0%	19.6%
	No	187	25	4	1	1	218
		83.1%	89.3%	36.4%	50.0%	20.0%	80.4%
Total		225	28	11	2	5	271
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Applied χ^2 test for significance. χ^2 value=28.784; p value \leq 0.001; consider highly significant

Table 6: Association of hysterectomy with placenta previa.

		Placenta previa					Total
		Placenta previa	Low lying	Accreta	Increta	Percreta	
Hysterectomy	Yes	24	4	6	0	4	38
		10.7%	14.3%	54.5%	.0%	80.0%	14.0%
	No	201	24	5	2	1	233
		89.3%	85.7%	45.5%	100.0%	20.0%	86.0%
Total		225	28	11	2	5	271
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Applied χ^2 test for significance. χ^2 value=35.466; p value \leq 0.001; consider highly significant

53 (19.6%) cases had PPH and 2 maternal mortalities due to hemorrhagic shock. One patient had placenta accreta and another patient had placenta percreta who had mortality. Table 5 explains that association of PPH with placenta previa is highly significant. 16 cases required 4 units of blood transfusion and 30 cases required 3 units and 44 cases needed 2 units of blood transfusion. 57 cases required one unit of blood transfusion. Total 38 (14%) patients required hysterectomy (Table 6).

Total number of low birth weight babies were 102 (37.6%), extremely low birth weight was in 48 (17.7%) which is still a major problem associated with placenta previa due to premature deliveries. Mean birth weight was 2.17 ± 0.68 kg. Male babies were 55.8% and female babies were 44.2%. Out of the total births 13.3% had intrauterine fetal demise, 10.7% required NICU admissions and 11.7% had low APGAR scores and 1.8% were twins.

DISCUSSION

Incidence of placenta previa in our study is found to be 2.8% which is quite high than other studies like Faiz et al showed incidence of placenta previa of 4/1000 live births in their study.⁴ Similarly, in Bahar et al study overall incidence was 0.73%.⁵ Reason for high incidence in our study is, that our center is a tertiary care center and we receive all high-risk patients round the clock. Although mean age of patients with placenta previa in our study was 28.23 years however this is contradictory to other studies which shows advancing age as a high risk for placenta previa.⁶

Placenta previa is high risk for preterm deliveries.⁷ This preterm, in maximum cases are because of active bleeding. In our study 37.3% patients had preterm delivery between gestational ages of 28-34 weeks.

46.5% patients had preterm deliveries as shown in study by Crane et al.⁸ Antepartum hemorrhage in women with placenta previa was associated with premature delivery (OR 14.9; 95% CI 4.9-45.1, $p < 0.001$), more commonly in women with major previa as described in Bahar et al study.⁵ In our study 68.5% patients did not have any high-risk factor. Strong effects of birth order is consistent with other studies.⁶ History of caesarean section was found to be the most common risk factor placenta previa.^{4,9} In Ramussen et al study, for association of previous caesarean as risk factor, adjusted OR was found to be 1.3.³ 30 patients of previa with APH could be conserved. The earlier is the gestation of APH the lesser is the chance of conserving the pregnancies. All patients who had minor or major APH, were hospitalized and were discharged after delivery. Literature also suggests that major placenta previa does not exclude out patient management but it is the APH which is important factor for admission.¹⁰⁻¹² In our study 6.7% patients had morbid adherent placenta (MAP) out of total previa cases. Incidence of MAP is also increasing as a result of increasing previous caesarean

pregnancies. Out of 18 cases, 13 were diagnosed by prenatal ultrasound and rest 5 were found to be per operatively as adherent placenta. Out of 28 low lying placenta, 6 patients had vaginal delivery. Rest were given trial of vaginal delivery but needed caesarean section in view of heavy bleeding.¹³ In a study by Taga et al, out of 11 patients with low lying placenta who were given trial of delivery, 3 needed caesarean due to heavy bleeding.¹⁴ Our results are consistent with other studies, that low lying placenta were associated with lesser maternal and fetal morbidity. 36.6% patients were operated under general anesthesia (GA) in our study and 63.4% patients received regional anesthesia (RA). GA group constituted of those patients who came either with hemorrhagic shock or required caesarean for fetal compromise. Parekh et al study also showed that 60% of their patients with placenta previa received regional anesthesia.¹⁵ Statistical regression models in their study showed that regional anesthesia is estimated to result in lesser blood loss and lesser need of blood transfusions. So specific contraindications for regional anesthesia relevant to APH include only maternal cardiovascular instability and coagulopathy. In presence of fetal compromise, it is reasonable to use general anesthesia to expedite delivery. A prospective randomized trial by Hong et al also concluded that regional anesthesia is better than general anesthesia in view of maternal hemodynamics and blood loss.¹⁶

53 (19.6%) cases had PPH in our study and for association of PPH with PP, p value was found to be < 0.001 which is suggestive of highly significant association. Out of 53, 20 cases required hysterectomy and rest (62%) were managed medically, compression sutures and intrauterine balloon tamponade. PPH is found to be increased in patients with APH. Pooled incidence from a metanalysis of PPH in placenta previa was found to be 22.3% which is in concordance of our study.¹⁷ Patients with previous caesarean with previa were found to have more PPH and this is similar to Fan et al study.¹⁷ Management of PPH by medical method and using compression sutures and bakri balloon tamponade is consistent with Ogoyama et al and Yoong et al study.^{18,19} Total 38 cases needed hysterectomy and association of hysterectomy with placenta previa was highly significant (p value < 0.001). Out of 38, 18 cases had accreta and percreta and 20 had atonic PPH. Crane et al also showed relative risk of 33 times of hysterectomy in placenta previa cases.²⁰ They also showed increased risk in patients with placenta accreta and with previous caesarean delivery. 45% of babies were low birth weight in our study and this was mainly because of preterm gestation. 13% had IUD. This is consistent with Crane et al study which showed rate of preterm birth in tune of 46.5%. In Bahar et al study association of APH with preterm deliveries was found to be highly significant with Odds ratio of 14.9.²

Limitation of study was small patient-size. Relationship of placenta previa with cervical length for prediction of APH could also have been done.

CONCLUSION

Placenta previa is a common high-risk factor in pregnancy but still in low income countries, many at times diagnosis of placenta previa is made in emergency when patient comes with torrential haemorrhage. Even forehand diagnosis of morbid adherent placenta should be there in all patients if there is high risk like placenta previa with previous caesarean present. Placenta previa is dangerous but if prior preparation is available in form of multidisciplinary approach, definitely both maternofetal outcome can be improved.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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