Original Article DOI: https://doi.org/10.51985/JBUMDC2018064

Incidence And Risk Factors Of Maternal And Fetal Outcomes Among Patients Of Placenta Previa With And Without Placenta Accreta

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ABSTRACT:

Objective: The aim of the study was to evaluate maternal and fetal outcomes among patients of placenta previa (PP) with and without placenta accreta (PA).

Methodology: All patients who underwent cesarean section for PP and PA were analyzed retrospectively at a tertiary care Combined Military Hospital Kharian, Pakistan, from February 2015 to March 2018. Maternal and neonatal data were obtained from medical records and the hospital database system.

Results: PA was found in 37 patients from 111 patients of PP and 74 were without PA with the rate of approximately 2/1000 and 4/1000 respectively were included in the study. The mean age was 31.16±2.65 (range 22–37) years, mean gravidity of 3.69 ±1.40 (range 1 - 9), mean parity 2.57±1.01 (range 1–5), mean number of cesarean sections 2.10±0.66, (range 1-3) and a mean gestational age at the time of cesarean section was 35.65±2.46 (range 28–41) weeks. The maternal risk factors revealed marked differences between placenta previa with accreta and without accrete. The mean intraoperative blood loss in PA was 3,000ml, with a loss of 2,000ml occurring in 60%, and 3,000 ml in 21% of the PA cases. The mean pRBC transfusion was 4 units, while 17% received 6 units. Fetal growth restriction was not seen. A total of 12 neonates were admitted in NICU, with 03 neonatal deaths. There was no maternal death. Neonates born to women with placenta accreta had significantly lower birth weight, Apgar scores at 1 min and 12% required admission to NICU with 3 neonatal deaths.

Conclusion: The advanced maternal age, past cesarean or uterine surgery, high parity as well as multiple gravidity were the risk factors for adverse fetal and maternal outcomes.

Key Words: Placenta previa, Placenta accreta, maternal outcome, Neonatal outcome.

INTRODUCTION:

Hemorrhage and the hypertensive disorders are the primary cause of maternal morbidity and mortality in the developed and developing world. The placenta accreta and its related pathologies are the leading cause of maternal hemorrhage and cesarean hysterectomy[1]. The PA defined as the placenta being adherent to the uterine wall without easy separation; was confirmed by clinical assessment, gray scale ultrasound done, evidence of gross placental invasion at the time of surgery or by pathologist proving adherence of placental villi to the myometrium without intervening decidua basalis[2].

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Received: 31-07-2018
Accepted: 21-12-2018

Deficiency of decidua basalis at the endometrial scar is thought to be the cause of placenta accreta. The decidual or trophoblast induced vascular remodeling are such disturbed that the myometrium is invaded deeply by the trophoblast. These larger diameter vessels conduct a greater blood volume than the smaller diameter spiral arteries, resulting massive intrapartum hemorrhage associated with high maternal morbidity and mortality at time of placental removal[2, 3]. The extreme variants of accreta include increta and percret. The risk factor for placenta accreta includes lower uterine segment implantation, damage or scarring due to dilatation and curettage (D&C) and myomectomy[4, 5].

The placenta accreta has increased the rate of cesarean section by 10 folds since 1950s,[6] the current rates range from 1/533 to 1/7000 live births in developed countries resulting a mortality rate of approximately 7% [1] however, other reasons to increase in cesarean delivery include assisted reproductive technology and older maternal age[6]. Ultrasound findings suggestive of placenta accreta include, loss of normal hypoechoic retroplacental zone, retroplacental myometrial thickness of <1mm, "swiss cheese" appearance, numerous coherent vessels and blood vessels or placental

tissue bridging uterine-placental margin, myometrial-bladder interface, or crossing the uterine serosa[7, 8].

Multidisciplinary team planning is required for mode of delivery as the uterine surgery may compromise future fertility, or radiological interventions to reduce maternal and neonatal morbidity[9]. The aim of the study was to evaluate maternal and fetal outcomes among patients of placenta previa (PP) with and without placenta accreta (PA).

METHODOLOGY:

This study was carried out in CMH Kharian Pakistan after taking approval from the ethical committee of the hospital. The hospital records from February 2015 to March 2018 were assessed and all patients who underwent caesarean section were included in the study. The patient age, years since married, gravidity, parity, gestational age at time of cesarean section, ultrasound (placental position) and history of previous cesarean section(s) were collected. The evaluation also included mode of delivery whether hysterectomy or cesarean section was done electively or in emergency, placenta removed or not were included. Maternal outcomes or morbidity included estimated blood loss during surgery and units of packed red blood cell transfusion given with any transfusion complication. The blood loss was calculated from the number of gauze pads soaked with blood during the surgery. The morbidity also included postpartum anemia, post-surgical infection, urinary tract injuries, psychological illness and cesarean hysterectomy. Data pertaining to neonatal outcome included gender, birth weight, Apgar score at 1 and 5 min, need for admission to NICU and any neonatal death were also recorded. In this hospital; surgeries for PA was managed by the obstetric consultant and a second consultant as emergency handling. The woman with PA was also evaluated prior to surgery by the urologist for insertion of a ureteric stent if required and by the vascular surgeon. Communication with blood bank personnel for supply of blood and blood products was also made forehand. The elective cesarean section was planned at 36–38 weeks if PA was suspected. All this data was recorded in SPSS version 23 and descriptive analysis was performed for all demographic variables, to find the association chi square was performed to assess various neonatal and maternal outcomes. P value <0.005 was statistically significant.

RESULTS:

A total of 111 patients with Placenta Previa (PP) were included in the study with the rate of 6/1000 from the total 18000 deliveries performed during the study period. The PP was confirmed on operative findings, complete PP was noticed in 65 cases, partial in 24 cases, marginal in 17 cases and low lying PP in four cases. PA was found in 37 patients from 111 patients of PP and 74 were without PA with the rate of approximately 2/1000 and 4/1000 respectively were included in the study. The mean age was 31.16±2.65 (range 22–37) years, mean gravidity of 3.69 ±1.40 (range 1 - 9), mean parity 2.57±1.01 (range 1–5), mean number of cesarean sections 2.10±0.66, (range 1-3) and a mean gestational age at the time of cesarean section was 35.65±2.46 (range 28–41) weeks. Majority of the patients 76(68.4%) were reported in OPD and 35 patients (31.6%) were brought in ER. Elective cesarean section was done in 52 patients (46.8%) while emergency cesarean section was performed in 59 (53.2%) patients. Nearly 21(57%) of PP patients with PA and 31(42%) of PP patients without PA underwent planned cesarean section while16 (43%) and 43(58%) of PP patients with and without PA underwent emergency cesarean. An estimated 10(27%) of PP with PA had cesarean with hysterectomy so their fertility was not preserved. Cesarean hysterectomy was done in 17(15.3%) patients from which 10(27%) were performed in PP patients with PA and 7(9.5%) in PP without PA. Previous history of cesarean section was found in 37(69.4%) in PP with PA and 11(30.6%) in PP without PA patients in this study. The statistically significant difference was observed while assessing the organ damaged in PP patients with PA and without PA which was 6(16.2%) and 19(25.7%) respectively.

The data of this study revealed statistically significant difference in degree of Previa, injury to urinary system, number of previous Cesarean and DIC while comparing two cohorts of PP with PA and PP without PA and the calculated P-value was 0.0001, 0.004, 0.0001 and 0.0001 respectively. Table-1.

The blood loss assessed in entire population was 1350ml average, from which 500 to 999 ml occurred in 11 patients (9.9%), 1000 to 1999ml occurred in 67 cases (60.4%); 2000–3000ml in 24 (21.6%); and >2,000 ml occurred in 09 (8.1%) of the cases. The mean PRBC transfusion requirement was up to one pint in 09 (8.1%) patients, 1–2 units in 52(46.8%) patients, 2–3 units in 19(17.2%) patients. The blood loss was more in patients of PP with PA compared to those without PA. The bleeding was controlled mostly by ligations of internal iliac artery or bilateral uterine artery ligation. Urinary tract injury occurred in 47(42.3%) patients, 32 (28.8%) patients showed psychological effects, 09 (8.1%) suffered from renal tubular necrosis, and 03 patients3 (2.7%) suffered disseminated intravascular coagulation (DIC). There was no maternal mortality.

For evaluating the fetal outcomes; a statistically significant result (p=0.0001) was observed while evaluating weight of neonate at different gestational age among patients of PP with PA and without PA. A similar trend was observed when neonate Apgar score was compared at 01 minutes (p=0.0001) and at five minutes it was (p=0.109) among both groups of PP patients with PA and without PA.(Table-2)

To assess the correlation between various neonatal and maternal outcomes; a significant positive correlation was observed between gestational age and neonatal weight (r=0.614, P= 0.0001) and with Apgar score at 5 minute (r=

Degree of previa				
Type 1 (low lying)	04 (3.6%)	0 (0%)	04 (5.4%)	0.0001*
Type II (marginal)	17 (15.2%)	0 (0%)	17 (23%)	
Type III (partial)	25 (22.6%)	03 (8.1%)	22 (29.7%)	
Type IV (complete)	65 (58.6%)	34 (91.9%)	31 (41.9%)	
Injury to urinary system				
Yes	47 (42.3%)	23 (62.2%)	24 (32.4%)	0.004*
No	64 (57.7%)	14 (37.8%)	50 (67.6%)	
No. of previous cesarean				
Nil	75 (67.6%)	12 (32.4%)	63 (85.1%)	0.0001*
1	16 (14.4%)	11 (29.7%)	05 (6.8%)	
2	14 (12.6%)	10 (27%)	04 (5.4%)	
3	06 (5.4%)	04 (10.8%)	02 (2.7%)	
DIC				
Yes	03 (2.7%)	01 (2.7%)	02 (5.4%)	0.0001*
No	108(97.3%)	36 (97.3%)	72 (87.3%)	
Placenta removed				
Yes	19 (17.11%)	07 (18.9%)	12 (16.2%)	0.791
No	91 (82.9%)	30 (81.1%)	62 (83.3%)	
PP anemia				
Yes	70 (63.1%)	26 (70.3%)	44 (59.5%)	0.302
No	41 (36.9%)	11 (29.7%)	30 (40.5%)	
Renal Tubular necrosis				
Yes	09 (8.1%)	02 (5.4%)	07 (9.5%)	0.715
No	102 (91.9%)	35 (94.6%)	67 (90.5%)	
Psychological effects				
Yes	32 (28.8%)	11 (29.7%)	21 (28.4%)	0.240
No	84 (71.2%)	31 (70.3%)	53 (71.6%)	

Table 1: Maternal outcomes among patients of PP with PA and PP without PA

Variable	N=111	PP with PA	PP without PA	P-value
Weight	2.64±0.39	2.50±0.41	2.72±0.37	0.007
1-minute Apgar score	6.93±1.10	6.37±1.34	7.21±0.84	0.000
5-minute Apgar score	8.60±1.16	8.35±1.27	8.72±1.10	0.109
NICU Admission	12 (10.8%)	07 (18.9%)	05 (6.8%)	0.060
Death	03 (2.7%)	02 (5.4%)	01 (1.4%)	

Table 2: Neonatal outcomes of Placenta Previa (PP) patients with PA and without PA

		Gestational age	Neonatal weight	Apgar score 5 minutes	Parity	Apgar score 1 minutes	Previous cesarean section
Apgar score 5 minutes	P. Correlation	.277**	.373**	1	-.356**	.648**	-.316**
	P-value	.003	.000		.000	.000	.001

** Correlation is significant at the 0.01 level (2-tailed). *Correlation significant at 0.05

Table-3: Pearson's Correlation between Gestational and Neonatal Outcomes

0.277, P=0.003). The previous cesarean sections showed significant negative correlation with gestational age (r= -0.227, P=0.017), neonatal weight (r= -0.366, P=0.0001) and with Apgar score 5 minute (r= -0.316, P=0.001). Apgar score 1 showed a positive correlation with 5-minute Apgar score (r=0.648, P=0.0001) while a negative correlation was

noticed with parity (r =-0.258, P=0.006). (Table-3).

DISCUSSION:

Our results showed significantly increased maternal morbidity in patients of Placenta Previa PP with PA and are in consistent with a number of studies[3,9- 12]. The women are at great risk with previous cesarean delivery, rate of previous caesarean section, short interval between caesarean section and conception, and massive obstetric hemorrhage[13-15].

Our result showed mean 1500 ml blood loss as a result of PA in 78 (69%) cases, in addition, mean PRBCs transfused packed red blood cells required was 3 units. These results are in agreement with Wright et al who reported a median blood loss of 1500 ml and a median PRBCs transfusion requirement of 4 units in 77 patients undergoing hysterectomy for PA[14]. Wright et al reported a mean of a median of 4.5 units transfused in patients with PA. it is now globally accepted that patients with PA should undergo surgery by experienced multidisciplinary surgeons team with urologists, general Surgeons, gynecologic oncologists, and an interventional radiologist or at least a second obstetric consultant to take rapid action to control bleeding and in taking decision for hysterectomy must be present where facilities of other specialties are not available to minimize maternal and neonatal morbidity and mortality[16-19].

About 90% patients of PP with PA and 89% of PP without PA were diagnosed on Gray scale ultra sonography that had a sensitivity of 77%–87%, specificity of 96%–98%, positive predictive value of 65%–93%, and a negative predictive value of 98%. Overall gray scale is sufficient and more sensitive to color Doppler or power Doppler to diagnose PA[20-22]. MRI though costly and require experience and expertise but help in clarification of suspected cases of PA. In our study 9% cases of PP were diagnosed by MRI.

Our results showed that patients with PA have greater age, gravidity and parity than without PA. The results are in agreement with Dandanet al[23] who reported that Placenta Accreta grows stronger as parity increases even if the numbers of cesarean sections are kept constant. Surraya et al[24] observed parity as an independent factor for PA in his study. A significant increased number of previous cesarean section in patients with PA compared to patients in the absence of PA was seen in our result which were in agreement with a number of studies resulted in increased possibility of PA with increased and subsequent deliveries whether vaginal or cesarean. As the rate of PA rises with rising cesarean rates since the last few decades therefore, the rate of primary and repeated cesarean sections should be decreased without increase in maternal-fetal morbidity and mortality. By reducing cesarean section and encouraging vaginal delivery after cesarean section with counseling the patients explaining the complications of repeat cesarean section can improve the situation in PA[15,25-27].

In our study 27(73%) cases of PP with PA and 36 (48%) cases of PP without PA underwent cesarean section. To significantly improve fetal maturity and to decrease fetal morbidity, the pregnancy should be carried as close to full term as possible. An elective surgery was done in 47% of patients with PA in our study, an attempt to avoid emergent surgery as some institutions justify elective surgery at 34–35 weeks to decreased neonatal morbidity[28-30].

In our study no neonate was small for gestation, however, half of our patients belonging to PA delivered before 36 weeks and more than 17% of newborns were admitted to the neonatal intensive care unit out of which 3 babies died. Our results are in consistent with Offer et al[31] who showed that not only females with placenta accrete had 75% preterm birth rate and were managed with planned caesarean section; but the preterm birth rate was also much higher among those with PP. [33]

A study carried out at Civil Hospital Karachi[32] reported neonatal mortality rate of 14% for placenta previa patients with maternal mortality of 2%, while a study done at Hameed Latif Hospital Lahore[4], reported 23.38% neonatal mortality in cases of PP. The neonatal complications associated with PP patients include respiratory distress syndrome and congenital anomalies. A low 1-minute Apgar score but an improved 5-minute Apgar score, an increase in neonatal weight with increase in gestational weeks in our results are in association with other studies.

CONCLUSION:

It is recommended that PA should be excluded in every case of PP to decrease the risk of feto-maternal morbidity and mortality. Planned delivery and intervention is necessary by multidisciplinary specialist team for women with placenta accreta.

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