Original Article

Risk Factors and Feto-Maternal Outcomes of Placenta Previa in Un-Scarred Patients at Liaquat University Hospital Hyderabad Sindh

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Abstract

Objective: To determine, frequency, risk factors of maternal and fetal morbidity and mortality in women with placenta previa in un-scared pregnant women.

Methodology: This prospective observational study was conducted in the Obstetrics and Gynecology Unit-I at Liaquat University Hospital, Hyderabad, from June 16, 2021, to January 16, 2022. It included unscarred pregnant women with placenta previa beyond 24 weeks of gestation, with singleton pregnancies, and those presenting with antepartum hemorrhage due to placenta previa who were willing to participate. Data were collected on maternal factors such as age, gestational age, parity, clinical features, obstetric history, timing of placenta previa diagnosis, duration of hospital stay, need for blood transfusion, mode of delivery, and any surgical interventions required to control bleeding. Neonatal outcomes were also recorded, including gestational age at birth, birth weight, APGAR scores, stillbirths, NICU admissions, and neonatal mortality. Data were entered and analyzed using SPSS version-26.

Results: Mean maternal age was 31.34 years and mean gestational age of 34.11 weeks. Maternal outcomes revealed 54.7% postpartum hemorrhage (PPH), 41.1% needed hemostatic sutures, and 27.4% required uterine packing or tamponade. Hysterectomy was performed in 13.7% of women, and most women received multiple blood transfusions. Only 2.1% needed ICU care, and one maternal death was reported. Fetal outcomes showed, 24.2% preterm births, 82.1% resulted in low birth weight, and 52.6% of neonates had birth asphyxia. Stillbirths were 6.3%, and 47.4% of newborns required NICU admission. Neonatal mortality during hospitalization was 46.3%.

Conclusion: Placenta was observed to be the major cause of adverse fetal and maternal outcome. Previous uterine curettage history, uterine anomalies, and artificial conception were observed to be the causative risk factors.

Keywords: Placenta previa, risk factors, pregnancy outcome.

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Introduction

Placenta previa occurs when the placenta partially or entirely covers the cervical opening.[1] This condition poses a significant risk for severe bleeding after childbirth,[1] and considerable threats to both maternal and neonatal well-being, while its clinical management continues to be complex and challenging.[2] It is responsible for about one-third of antepartum haemorrhage and main cause of vaginal bleeding during the 3rd trimester and a substantial contributor to hospitalization and caesarean sections. The painless haemorrhage known as placenta previa does not start to manifest until the 2nd trimester or later. Blood loss in placenta previa is typically abrupt, painless, seemingly causeless, and recurrent.[1] It typically implant in the lower uterine segment, an area prone to ongoing bleeding due to neovascularization and limited uterine

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contractility and this persistent hemorrhage significantly raises the likelihood of complications such as blood transfusion, surgical removal of the uterus, intensive care admission, thromboembolic events, and even maternal mortality.[3] Additionally newborns of mothers with placenta previa are at a higher risk of adverse outcomes, including preterm delivery, perinatal mortality, congenital anomalies, and low Apgar scores at both 1 and 5 minutes.[4] Studies have also shown that a significant proportion of these infants require immediate resuscitation and admission to the NICU. Additionally, one of the most notable consequences associated with placenta previa is the increased incidence of small-for-gestational-age infants and low birth weight.[4]

The risk of placenta previa in unscarred patients are advanced maternal age, multi-parity, smoking, twin pregnancy, previous uterine curettage, abnormal uterus, endometriosis and patients who conceived with artificial technique. The incidence of placenta previa in un-scarred younger women is 1 in 1500 (19 years of age or younger) and 1 in 100 in women older than 35 of age.[5] Several studies discovered a variety of risk factors for placenta previa, apart from prior caesarean sections, such as the past abortions, which produced a risk of 2.75 and the risk rising with the number of prior abortions (1 or more).[6,7] Some earlier investigations found a connection amongst placenta previa and the newborn's male gender.[6] The removal of the uterus, myomectomy, and curettage are also related to placenta previa. Old aged and multiparous females are more likely to experience placenta previa.[8-10] The cause is unclear; however, it might be related to the uterine artery's ageing. Conception spacing is linked to a risk of placenta previa, which results in placental hypertrophy and expansion and increases the possibility of the placenta intruding on lower uterine segment.[8,9]

There are several studies published on placenta previa in scarred uterus, but limited studies on placenta previa in un-scarred uterus. After taking above limited literature and controversies this study has been done to identify, how often, and what factors contribute to death rate and morbidity of the mother and the fetus in placenta previa patients in un-scared pregnant women. The findings may help emphasize the importance of early diagnosis, thorough evaluation, timely delivery, and adequate resuscitation through a multidisciplinary approach to significantly improve maternal and perinatal outcomes.

Methodology

This prospective observational study was conducted in the Obstetrics and Gynecology Unit-I of Liaquat University Hospital, Hyderabad, from June 16, 2021, to January 16, 2022. The sample size of 95 participants was determined using the WHO sample size calculator, based on the reported incidence of placenta previa in unscarred women, with a 95% confidence interval and 2% margin of error. Participants were selected through consecutive non-probability sampling, focusing on unscarred pregnant women diagnosed with placenta previa during the study period. The study included women aged 18–45 years with singleton pregnancies ≥24 weeks gestation, regardless of parity, who presented with antepartum hemorrhage confirmed as placenta previa and provided informed consent. Exclusion criteria involved gestational age <24 weeks, prior cesarean delivery or uterine scarring, antepartum hemorrhage from non-placenta previa etiologies (e.g., placental abruption), pre-eclampsia or HELLP syndrome, and multiple pregnancies.

Ethical approval was obtained from the Institutional Review Board of Liaquat University Hospital, IRB no.LUMHS/C.E(PG)/COND/9) and written informed consent was secured from all participants. Patient confidentiality was maintained through anonymization of data. Clinical evaluations were performed to document maternal demographic characteristics (age, parity), gestational age at diagnosis and delivery, clinical presentation, obstetric history, hospitalization duration, blood transfusion requirements, mode of delivery (vaginal or cesarean), and surgical interventions such as cervico-isthmic stitching. Neonatal outcomes, including Apgar scores at 1 and 5 minutes, birth weight, NICU admission, stillbirth, and neonatal mortality, were recorded and stratified by gestational age at delivery. Data were analyzed using SPSS version 26, with continuous variables expressed as means ± standard deviation and categorical variables as frequencies or percentages.

Results

In this series total 95 women who were presented placenta previa, their average age was 31.34 $\pm$ 4.20 years, and average gestational age was 34.11$\pm$3.59 weeks. Out of all patients, most were un-booked (58.9%) and from rural areas (67.4%). Emergency cesarean section was the most common mode of delivery (73.7%). A history of uterine curettage was

found in 36.8% of cases, while uterine anomalies were rare (8.4%). Most pregnancies were naturally conceived (87.4%), and only a small proportion involved artificial conception (10.5%). (Table I)

Table I: Demographic characteristics of the patients. (n=95)

Variables	N. of cases	%
Booking status	39	41.1%
Booked	56	58.9%
Un-booked		
Residential status		
Rural	64	67.4%
Urban	31	32.6%
Mode of delivery		
Normal vaginal delivery	21	22.1%
Emergency C-section	70	73.7%
Instrumental	04	04.2%
Previous uterine curettage		
Yes	35	36.8%
No	60	63.2%
Uterine anomaly		
Yes	08	08.4%
No	87	91.6%
Natural conception		
Yes	83	87.4%
No	12	12.6%
Artificial conception		
Yes	10	10.5%
No	85	89.5%

Maternal outcomes showed that over half (54.7%) of the cases had postpartum hemorrhage, and 41.1% required hemostatic sutures. Uterine packing or tamponade was needed in 27.4% of cases, while hysterectomy was performed in 13.7%. ICU admissions were rare (2.1%), and there was one maternal death (1.1%). Most patients stayed in the hospital for 4–7 days. Additionally, according to fetal outcomes, 24.2% of the babies were preterm, 82.1% had low birth weight, and 52.6% suffered from birth asphyxia. There were 6 stillbirths (6.3%), and nearly half (47.4%) required NICU admission. Neonatal mortality was also high at 46.3%. (Table II)

The descriptive statistics for the APGAR scores of 95 newborns showed that the mean score at 1 minute was 4.41, which improved to 5.01 at 5 minutes. The median APGAR score increased from 5.00 at 1 minute to 6.00 at 5 minutes. The standard deviation was 2.79 at 1 minute and 3.11 at 5 minutes, reflecting moderate variability in the scores among the newborns. (Table III)

Discussion

In this study mean age of the women was 31.34 ± 4.20 years and mean gestational age was 34.11±3.59 weeks. Additionally, out of all 67.4% cases were form

Table II: Maternal and fetal outcome of the patients. (n=95)

Maternal outcome		No of cases	%
Post-partum haemorrhage	Yes	52	54.7%
	No	43	45.3%
Hemostatic sutures	Yes	39	41.1%
	No	56	58.9%
Uterine packing/ tamponade	Yes	26	27.4%
	No	69	72.6%
Hysterectomy	Yes	13	13.7%
	No	82	86.3%
Blood transfusions	1-3	42	44.2%
	4-6	36	37.9%
	>6	17	17.9%
ICU admission	Yes	02	02.1%
	No	93	97.9%
Mortality	Yes	01	01.1%
	No	94	98.9%
Hospital stay	1-3 days	44	46.3%
	4-7 days	47	49.5%
	>7 days	04	04.2%
Fetal Outcome			
Pre-term		23	24.2%
Low birth weight		78	82.1%
Birth asphyxia		50	52.6%
Still born		06	06.3%
NICU admission		45	47.4%
Neonatal mortality		44	46.3%

Table III: Descriptive statistics of Apgar score at 1 minute and at 5-minute. (n=95)

Statistics	Apgar score	
	At 1 minute	At 5 minutes
Mean	4.41	5.01
Median	5.00	6.00
Std. Deviation	2.79	3.11

rural areas and 32.6% were from urban areas, 58.9% women were un-booked and remaining 41.1% were booked. Similarly, Tabassum R et al[11] reported that average age of the women was 28.37±4.74 year, booked patients were 26 (33.8 %) and 34 (44.2) were un-booked. In the study of Abisowo OY et al[12] reported that 51% booked versus 72% un-booked were studies to ascertain how the booking status of parturients with placenta previa who underwent caesarian birth affected the foetal and mother outcome and they observed that the Un booking status in women having placenta previa is linked to higher mortality, more preterm births, lower Apgar scores, and a higher proportion of neonatal mortality. It also greatly raises the risk for antepartum and postpartum blood transfusions and these findings were almost similar to this study.

This study identified several significant risk factors among women with placenta previa, including a history of uterine curettage (36.8%), uterine anomalies (8.4%),

natural conception (87.4%), and assisted conception (10.5%). These findings are consistent with existing literature, though some variations exist. While Zhang et al.[13] reported no significant differences in maternal age, education level, abortion history, or neonatal gender between women with and without placenta previa, other studies support our observations. Nur Azurah et al.[14] demonstrated that primigravid women with placenta previa more frequently had endometriosis and conceived through assisted reproductive techniques (ART). Similarly, Romundstad et al.[15] found a six-fold increased risk of placenta previa in ART-conceived pregnancies compared to spontaneous conceptions.

The exact pathophysiology of placenta previa remains incompletely understood, though uterine scarring has been implicated in abnormal placental implantation. A large study of 308 placenta previa cases identified associations with advanced maternal age, multiparity, prior cesarean delivery, uterine curettage, uterine malformations, and previous placenta previa diagnosis. Healy et al.[16] further observed that women with endometriosis who conceived via ART had a higher placenta previa prevalence than those without endometriosis. Notably, placenta previa also occurs in primigravidas lacking traditional risk factors, suggesting alternative pathogenic mechanisms. This is supported by recent data showing comparable placenta previa rates between IVF/ICSI and gamete intrafallopian transfer cycles[17], implying that transcervical embryo transfer procedures alone may not entirely account for the ART-associated risk.

Collectively, these findings underscore the multifactorial etiology of placenta previa, involving both established risk factors and potentially unrecognized mechanisms. Further research is needed to elucidate the complex interplay of iatrogenic, anatomical, and biological contributors to this condition.

In this study placenta previa was associated with significant maternal complications, including a high rate of postpartum hemorrhage (54.7%), frequent need for hemostatic interventions, and hysterectomy (13.7%). Most patients required blood transfusions, and one maternal death occurred. These findings align with previous studies that report similar risks, like Dwivedi et al[18] reported maternal complications in 40.8% of patients, including acute renal failure (4.6%), postpartum hemorrhage (29.8%), hemorrhagic shock (25.6%), and maternal mortality (3.4%). ICU admission and uterine rupture were also reported in their study. The high rate of hysterectomy in our study is consistent with other research indicating its association with prior cesarean sections and placenta accreta. Blood transfusion was required in 68.3% of our cases, which is higher compared to rates reported by Brenner et al. (36%) and Willikan et al. (52.4%).

In the present study, a significant proportion of neonates exhibited adverse outcomes: low birth weight, birth asphyxia in 52.6% of cases, stillbirths in 6.3%, NICU admissions in 47.4%, and an overall neonatal mortality rate of 46.3% during hospital stay. These findings partially align with those reported by Nair RV et al[19], who observed that 15% of infants born to mothers with placenta previa required NICU admission, although no stillbirths were reported in their cohort. This discrepancy may be attributed to differences in the study populations, levels of antenatal care, or hospital resources. Similarly, Kaur K et al[20] documented stillbirths in 5.26% and neonatal deaths in 8.82% among unscarred women with placenta previa, which supports the presence of poor perinatal outcomes but reflects a lower mortality rate than that observed in our study. The variation may be due to the differences in the presence of maternal comorbidities, referral delays, or intrapartum care protocols.

Furthermore, Pun I et al[21] reported consistent findings in one of their study groups, with two stillbirths, 73.42% of neonates weighing more than 2.5 kg, 72% having Apgar scores above seven, and only 1.36% requiring NICU admission. The lower NICU admission and preterm birth rates in their study compared to ours could be attributed to better prenatal monitoring or earlier intervention in high-risk pregnancies. These comparative results highlight both the variability in neonatal outcomes associated with placenta previa and the critical role of healthcare infrastructure and timely obstetric care. Despite providing valuable insights into the neonatal and maternal outcomes associated with placenta previa, this study has several limitations, like the sample size was limited, patients were not followed for a prolonged period after hospital discharge, and the study did not differentiate or compare outcomes between scarred and unscarred uteri, which could have provided more comprehensive insights into risk stratification and management. To validate the findings of this study, future studies should be conducted on a larger, more diverse population, allowing for greater statistical power and generalizability. It is also recommended that comparative analyses between scarred and unscarred uterine groups be undertaken to

identify specific risk patterns. A multicenter approach may also enhance the robustness of future research and support the development of standardized management protocols.

Conclusion

Placenta previa observed to be a significant contributor to adverse maternal and fetal outcomes, particularly in unscarred pregnant women. History of previous uterine curettage, presence of uterine anomalies, and conception through assisted reproductive techniques noted to be the key risk factors. Overall findings underscore the importance of early identification and risk stratification in pregnant women to minimize complications. Due some significant limitations, further large-scale, multi-center studies are strongly recommended to validate these results and develop standardized clinical guidelines.

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