

Original article

Risk Factors and Outcomes of Placenta Previa among Admitted Pregnant Women in Benghazi Medical Centre: A Cross-Sectional Study

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Abstract

Placenta previa is a problem during pregnancy when the placenta completely or partially covers the opening of the uterus (cervix). Placenta previa means the placenta has implanted at the bottom of the uterus, over the cervix, or close by, which means the baby can't be born vaginally. The placenta is an organ that develops in the uterus during pregnancy. In most pregnancies, the placenta attaches to the top or side of the uterus. In placenta previa, the placenta attaches low in the uterus. The study aims to assess the risk factors for placenta previa and fetal-maternal outcomes. A retrospective cross-sectional study included all pregnant women with placenta previa who were admitted to Benghazi Medical Center from 1st of Jan. 2020, to 31st of Dec., 2021 (two-year period). A total of 188 cases with a diagnosis of placenta previa were reviewed. Grand multigravida showed higher rates of emergency caesarean section. Higher rates of hysterectomy, higher rates of bladder injury with marginal significance, and higher rates of prematurity. A history of two or more previous sections increases the risk of blood transfusion, fresh frozen plasma use, bladder injury, and hysterectomy. Maternal age does not appear to affect maternal outcomes. In terms of perinatal outcomes, maternal age, gravidity, and history of prior sections have no effect; however, a history of two or more prior scars is associated with a higher rate of prematurity. Grand multigravida women also had higher rates of emergency caesarean sections, hysterectomy, and bladder injury.

Keywords. Risk Factors, Outcomes, Placenta Previa, Benghazi.

Introduction

Placenta previa is a problem during pregnancy when the placenta completely or partially covers the opening of the uterus (cervix). Placenta previa means the placenta has implanted at the bottom of the uterus, over the cervix, or close by, which means the baby can't be born vaginally [1]. In most pregnancies, the placenta attaches to the top or side of the uterus. In placenta previa, the placenta attaches low in the uterus. The placenta might completely or partially cover the opening of the cervix. Placenta previa can cause severe bleeding in the mother before, during, or after delivery. The placenta works to provide oxygen and nutrition to the baby and to remove waste [2].

Changes in the uterus and placenta during pregnancy may lead to the problem correcting on its own. If it does not, the baby is delivered by cesarean section (C-section) [3]. Passage of the baby through the birth canal can also tear the placenta, causing severe bleeding [4]. Placenta previa occurs in about 1 of 800 deliveries. During the 2nd trimester, as many as 2% of pregnant women have placenta previa [4]. The underlying cause of placenta previa is unknown. Most cases are diagnosed early on in pregnancy via sonography, and others may present to the emergency room with painless vaginal bleeding in the second or third trimester of pregnancy. The main sign of placenta previa is bright red vaginal bleeding, usually without pain, after 20 weeks of pregnancy. Sometimes, spotting happens before an event with more blood loss. The bleeding may occur with pre-labor contractions of the uterus that cause pain [5]. Obstetric hemorrhage is an important cause of maternal and neonatal death and morbidity in the developing world. Placenta previa represents 1/5th of antepartum bleeding, affecting 0.4–0.5% of all pregnancies [6].

It is a major risk factor for postpartum hemorrhage and can lead to morbidity and mortality of the mother and neonate. The presence of placenta previa can also increase a woman's risk for placenta accreta spectrum (PAS) [7]. Uncontrolled postpartum hemorrhage from placenta previa or PAS may necessitate a blood transfusion, hysterectomy, thus leaving the patient infertile, admission to the ICU, or even death. More than half of the women with placenta previa experience APH. The initial bleeding episode occurs before 30 weeks' gestation in approximately one-third of women with placenta previa. This group is more likely to require blood transfusion and shows a higher rate of preterm delivery and perinatal mortality compared with cases in which bleeding begins later in gestation [7]. Sonographic features, such as a thick placental edge, short cervical length, and decreased cervical length in the third trimester, are associated with a higher likelihood of antepartum bleeding [8]. The incidence of placenta previa is 3-5 per 1000 pregnancies worldwide, and it is still rising because of increasing caesarean section rates. This is because a uterine scar in the lower segment may lead to low placental implantation [8].

While the exact cause of placenta previa is not clear, understanding both the potential causes and risk factors provides an idea of who may be at risk [9]. Several key factors may contribute to placenta previa. The location of the placenta within the uterus plays a significant role; in cases where the placenta attaches to the lower part of the uterus, closer to the cervix, the risk of placenta previa is further increased. An unusually shaped uterus, whether congenital or due to factors such as fibroids, can contribute to placenta previa. [10]. Scar tissue within the uterine cavity resulting from prior surgeries or procedures, such as a previous cesarean section or dilation and curettage (D&C), can elevate the risk of placenta previa [11].

Certain factors can heighten an individual's susceptibility to placenta previa: advanced maternal age over 35 years [12], previous placenta previa, multiple pregnancies [12,13], previous cesarean sections [12,14], smoking during pregnancy [12,15], and in vitro fertilization (IVF) [12, 16].

Placenta previa has become more evident secondary to the increasing rates of cesarean sections [17]. Placenta previa can pose risks to both the mother and the baby and requires close attention and careful management due to the potential complications, such as maternal complications: premature labor or delivery, hemorrhage, emergency cesarean section, and shock due to rapid blood loss [18], or perinatal complications, such as fetal distress, fetal growth problems, and preterm birth complications [19]. This study determined the risk factors and outcomes of placenta previa in the mother and fetus, for which there are few studies done within the Benghazi Medical Center to create a database for it.

Methodology

A retrospective cross-sectional study was carried out through the department records, including all pregnant women diagnosed with placenta previa admitted to the Department of Obstetrics and Gynecology, Benghazi Medical Center, from 1st of Jan. 2020, to 31st of Dec., 2021 (two-year period).

Operational Definitions

- Optimal maternal age: 20–34 years.
- Advanced maternal age: 35–39 years.
- Very advanced maternal age: ≥ 40 years.
- Grand- Multigravida: Gravida 5 or more (including the current pregnancy).
- Grand- Multipara: Para 5 or more previous viable births.

Data were analyzed using the SPSS statistical package of the social sciences version 23. The statistical analysis included descriptive statistics, mean value, standard deviation, number, and percentage. Inferential statistics: a chi-square test was used, and the P-value will be considered significant when ≤ 0.05 .

Ethical consideration

The study was observational; no intervention was applied. Data were collected after obtaining formal permission from authorized personnel; patient data in the records were secured.

Results

A total of 188 case files with a diagnosis of placenta previa were reviewed. Most (181, 96.3%) of the mothers were Libyan. The age ranges from 20 to 47 years, with a mean $\pm$ SD of 35.89 $\pm$ 5. 2, 62(33%) of mothers were advanced age and 53(28.2%) were very advanced age, 116(61.7%) had two or more caesarian section, 88(46.8%) were Grand-Multigravida, and 58(30.9%) were Grand- Multipara (Table 1).

Table 1. Distribution of mothers' characteristics.

Variable	Frequency(n)	Percent (%)
Nationality		
Libyan	181	96.3
Non-Libyan	7	3.7
Maternal Age		
Optimal (20-234 years)	73	38.8
Advanced (35-39 years)	62	33.0
Very advanced (≥ 40 years)	53	28.2
No. of Previous Section		
None	35	18.6
Once	37	19.7
Two or more	116	61.7
Gravidity		
Grand -Multigravida (5 or more)	88	46.8
Not Grand – Multigravida	100	53.2
Parity		
Grand- Multipara (5 or more)	58	30.9
Not Grand -Multipara	130	69.1

The study reported that about 28.7% of pregnant women underwent emergency caesarean section, only 6(3.2%) had Postpartum Hemorrhage (PPH), 152(80.9%) had blood transfusion, 49(26.1%) had Transfusion of Fresh Frozen Plasma (FFP), 21(11.2%) had bladder injury, and 9(10.1%) had hysterectomy. Table 2

Table 2. Distribution of Maternal Outcomes.

Variable	Frequency (n)	Percentage (%)
Caesarean Section		
Emergency	54	28.7
Elective	134	71.3
PPH		
Yes	6	3.2
No	182	96.8
Blood Transfusion		
Yes	152	80.9
No	36	19.1
FFP		
Yes	49	26.1
No	139	73.9
Bladder Injury		
Yes	21	11.2
No	167	88.8
Hysterectomy		
Yes	9	10.1
No	169	89.9

About perinatal outcomes in the study revealed that 50(26.6%) of babies had fetal distress, 44(23.4%) were premature, 4(2.1%) stillbirth, 14(7.4%) early death and 18(9.6%) perinatal death (Table 3).

Table 3. Distribution of Perinatal Outcomes.

Variable	Frequency(n)	Percent (%)
Fetal Distress		
Yes	50	26.6
No	138	73.4
Premature		
Yes	44	23.4
No	144	76.6
Stillbirth		
Yes	4	2.1
No	184	97.9
Early Neonatal Death		
Yes	14	7.4
No	174	92.6
Perinatal Death		
Yes	18	9.6
No	170	90.4

Maternal outcomes were not affected by maternal age. Grand multigravida showed higher rates of emergency caesarean section. Higher rates of hysterectomy were observed, with definite statistically significant differences. Also, they showed a higher rate of bladder injury with marginal significance. The history of any previous caesarean delivery was associated with statistically significantly higher rates of fresh frozen plasma use, bladder injury, and hysterectomy. Several previous scars of two or more increase the risk of blood transfusion, fresh frozen plasma use, bladder injury, and hysterectomy. Regarding perinatal outcomes, gravidity and history of any previous section have no statistically significant differences. A history of two or more previous scars is associated with a statistically significantly higher rate of prematurity (Table 4-9).

Table 4. Maternal Outcomes According to Gravidity

Outcome	Gravidity				P
	Grand- Multi		Non-Grand- Multi		
	N	% within gravidity	N	% within gravidity	
Emergency caesarean	32	36.4%	22	22.0%	0.030 †
Elective caesarean	56	63.6%	78	78.0%	
PPH	1	1.1%	5	5.0%	0.217 *
Any blood transfusion	71	80.7%	81	81.0%	0.956
Any FFP transfusion	26	29.5%	23	23.0%	0.308

Bladder injury	14	15.9%	7	7.0%	0.053 ‡
Hysterectomy	13	14.8%	6	6.0%	0.046 †

* Fisher's exact test used. † Significant at a level of confidence of 95%. ‡ Marginally significant at a level of confidence. PPH: post-partum hemorrhage. FFP: fresh frozen plasma. N: count of cases.

Table 5. Maternal Outcomes According to any Previous Scar

Outcome	Any previous scar				P
	Any		None		
	N	% within previous scar	N	% within previous scar	
Emergency caesarean	47	30.7%	7	20.0%	0.206
Elective caesarean	106	69.3%	28	80.0%	
PPH	3	2.0%	3	8.6%	0.079 *
Any blood transfusion	125	81.7%	27	77.1%	0.537
Any FFP transfusion	47	30.7%	2	5.7%	0.002†
Bladder injury	21	13.7%	0	0.0%	0.016†
Hysterectomy	19	12.4%	0	0.0%	0.027†

* Fisher's exact test used. † Significant at a confidence level of 95%. ‡ Marginally significant at a confidence level. PPH: post-partum hemorrhage. FFP: fresh frozen plasma. N: count of cases.

Table 6. Maternal outcomes according to the number of previous scars

Outcome	Number of previous scars				P
	Two or more scars		No or one scar		
	N	% within previous scar	N	% within previous scar	
Emergency caesarean	37	31.9%	17	23.6%	0.222
Elective caesarean	79	68.1%	55	76.4%	
PPH	2	1.7%	4	5.6%	0.205*
Any blood transfusion	104	89.7%	48	66.7%	< 0.001†
Any FFP transfusion	40	34.5%	9	12.5%	0.001 †
Bladder injury	18	15.5%	3	4.2%	0.016 †
Hysterectomy	18	15.5%	1	1.4%	0.002 †

*Fisher's exact test used. † Significant at a confidence level of 95%. ‡ Marginally significant at the level of confidence. PPH: post-partum hemorrhage. FFP: fresh frozen plasma. N: count of cases.

Table 7. Perinatal Outcomes According to Gravidity

Outcome	Gravidity				P
	Grand multi		Non grand multi		
	N	% within gravidity	N	% within gravidity	
Fetal distress	22	25.0%	28	28.0%	0.642
Prematurity	25	28.4%	19	19.0%	0.128
Perinatal mortality	10	11.4%	8	8.0%	0.434

* Fisher exact test used. † Significant at a confidence level of 95%. ‡ Marginally significant at level of confidence. N: count of cases.

Table 8. Perinatal Outcomes According to Any Previous Scar

Outcome	Any Previous Scar				P
	Any		None		
	N	% within previous scar	N	% within previous scar	
Fetal distress	44	28.8%	6	17.1%	0.161
Prematurity	38	24.8%	6	17.1%	0.332
Perinatal mortality	17	11.1%	1	2.9%	0.204 *

* Fisher exact test used. † Significant at a level of confidence of 95%. ‡ Marginally significant at a level of confidence. N: count of cases.

Table 9. Perinatal outcomes according to number of previous scars

Outcome	Number of Previous Scars				P
	Two or More		No or One Scar		
	N	% within previous scar	N	% within previous scar	
Fetal distress	33	28.4%	17	23.6%	0.466
Prematurity	33	28.4%	11	15.3%	0.038 †
Perinatal mortality	14	12.1%	4	5.6%	0.140

* Fisher exact test used. † Significant at a level of confidence of 95%; ‡ marginally significant at a level of confidence. N: count of cases.

Discussion

Placenta previa remains one of the most serious obstetric complications because of its association with severe maternal hemorrhage, operative morbidity, and adverse perinatal outcomes. The present study reviewed 188 cases of placenta previa and demonstrated that advanced maternal age, grand multiparity, and previous cesarean delivery were highly prevalent among affected women. Furthermore, previous cesarean scars, particularly two or more scars, were significantly associated with adverse maternal outcomes, while perinatal morbidity was mainly reflected by prematurity, fetal distress, and perinatal mortality.

Maternal Characteristics and Risk Factors

The mean maternal age in the present study was 35.89 ± 5.2 years, and more than 60% of women were either of advanced age (≥ 35 years) or very advanced age. This finding supports the established association between increasing maternal age and placenta previa. Degenerative vascular and endometrial changes accompanying advancing age may impair implantation in the upper uterine segment, resulting in abnormal placental localization. Similar observations were reported by Almaksoud (2014) in Libya, who identified advanced maternal age as a major risk factor for placenta previa [20].

Comparable findings have also been documented internationally by Faiz and Ananth (2003), who demonstrated that the risk of placenta previa increases substantially after the age of 35 years [2].

Grand multigravidity (46.8%) and grand multiparity (30.9%) were also common among affected women. These findings are consistent with previous Libyan studies, including the work of Emjawer et al. (2022), which reported a predominance of multiparous women among placenta previa cases. Repeated pregnancies may lead to endometrial damage and altered uterine vascularization, increasing the likelihood of abnormal placental implantation [21]. Similar trends have been reported across Middle Eastern countries and globally, where high parity remains a significant predictor of placenta previa (Silver, 2015; Jauniaux & Bhide, 2017) [22]. One of the most important findings of the present study is the high prevalence of previous cesarean delivery. Nearly two-thirds (61.7%) of patients had two or more previous cesarean sections. This observation strongly supports existing evidence linking uterine scarring with placenta previa. Clark et al. (1995) demonstrated that the risk of placenta previa increases progressively with the number of previous cesarean deliveries [23]. Likewise, Al-Sibai et al. (1994) reported that women with two or more previous cesarean sections had a markedly increased risk of placenta previa and placenta accreta spectrum disorders [24].

Maternal Outcomes

Emergency cesarean section occurred in 28.7% of cases. Although lower than rates reported in some developing-country studies, this finding still reflects the tendency of placenta previa to present with sudden antepartum bleeding requiring urgent intervention. Abid et al. (2023) reported significantly poorer maternal outcomes among women undergoing emergency cesarean section compared with elective procedures in Libyan hospitals [25]. Postpartum hemorrhage was documented in only 3.2% of cases. However, despite the relatively low recorded rate of hemorrhage, 80.9% of women required blood transfusion, and 26.1% received fresh frozen plasma. These findings suggest substantial intraoperative blood loss and highlight the importance of proactive transfusion management. Similar high transfusion requirements have been reported by Emjawer et al. (2022) and Turkuman et al. (2022), who identified massive obstetric hemorrhage as one of the leading complications of placenta previa in Libya [21, 26].

Bladder injury occurred in 11.2% of women, while hysterectomy was performed in approximately 10% of cases. These rates are relatively high and may reflect the coexistence of placenta accreta spectrum disorders, particularly among women with multiple previous cesarean scars. Abid et al. (2023) [25] reported similar findings in Libyan patients with placenta accreta spectrum associated with placenta previa, where bladder injury and hysterectomy represented major maternal complications. International studies have consistently shown that previous cesarean delivery combined with placenta previa markedly increases the risk of abnormal placental invasion and cesarean hysterectomy (Jauniaux & Bhide, 2017; Silver, 2015) [22, 27].

Interestingly, maternal age was not significantly associated with adverse maternal outcomes in the current study. This suggests that while advanced maternal age contributes to the occurrence of placenta previa, the severity of maternal complications may depend more on obstetric history, particularly parity and previous uterine surgery.

Association Between Gravidity and Maternal Outcomes

Grand multigravida women demonstrated significantly higher rates of emergency cesarean section and hysterectomy, with a marginally significant increase in bladder injury. Similar findings have been reported by Silver (2015), who emphasized that increasing parity is associated with higher operative complexity and greater risk of severe obstetric complications [27]. Repeated pregnancies may contribute to uterine structural changes and increase the likelihood of abnormal placentation.

Previous Cesarean Delivery and Maternal Outcomes

The most significant predictor of maternal morbidity in the present study was previous cesarean delivery. Women with any previous cesarean section experienced significantly higher rates of fresh frozen plasma transfusion, bladder injury, and hysterectomy. Moreover, women with two or more previous scars had significantly increased risks of blood transfusion, FFP administration, bladder injury, and hysterectomy. These findings are consistent with the international literature. Clark et al. (1995) demonstrated a dose-response relationship between the number of cesarean sections and the risk of placenta previa [23]. Similarly, Sindiani et al. (2021) found that previous cesarean delivery significantly increased operative blood loss, transfusion requirements, and maternal morbidity among women with placenta previa [28]. Furthermore, Al-Sibai et al. (1994) reported that the risk of placenta accreta increased dramatically after two or more cesarean sections, thereby increasing the likelihood of hysterectomy and adjacent organ injury [24]. These findings emphasize the cumulative adverse effect of repeated cesarean sections and support current international recommendations aimed at reducing unnecessary primary cesarean deliveries.

Perinatal Outcomes

The present study revealed substantial neonatal morbidity. Fetal distress occurred in 26.6% of newborns, prematurity in 23.4%, stillbirth in 2.1%, early neonatal death in 7.4%, and overall perinatal mortality in 9.6%.

Prematurity was the most important adverse neonatal outcome. This finding is expected because placenta previa frequently necessitates early delivery due to antepartum hemorrhage or maternal instability. Similar rates of preterm delivery have been reported by Emjawer et al. (2022) in Benghazi [21] and by Abid et al. (2023) in Tripoli [28]. Globally, placenta previa is recognized as one of the leading causes of medically indicated preterm birth (Jauniaux & Bhide, 2017) [22]. The observed fetal distress rate of 26.6% also agrees with previous regional and international studies that reported increased neonatal compromise secondary to placental insufficiency, maternal bleeding, and preterm birth. Likewise, the perinatal mortality rate of 9.6% remains a considerable burden, although it is lower than rates reported historically in low-resource settings. Improvements in neonatal intensive care and antenatal diagnosis may have contributed to better survival outcomes.

Maternal age, gravidity, and previous cesarean delivery did not significantly influence perinatal outcomes in the present study. However, women with two or more previous cesarean scars showed significantly higher rates of prematurity. This finding likely reflects increased obstetric intervention due to concerns about hemorrhage, placenta accreta spectrum, or uterine rupture. Similar observations have been reported by Sindiani et al. (2021), who found that women with multiple previous cesarean sections were more likely to undergo earlier delivery [28].

Limitations

The study's limitation is that it was retrospective and included a small number of participants from a single hospital. The findings cannot be generalized to the broader population. As this is a case series study, there is no comparison group.

Conclusion

The study concluded that placenta previa continues to be associated with substantial maternal and neonatal morbidity.

- Grand multigravida showed higher rates of emergency caesarean section and higher rates of hysterectomy.
- Grand multigravida also showed a higher rate of bladder injury.
- The number of previous scars of two or more increases the risk of blood transfusion, fresh frozen plasma use, bladder injury, and hysterectomy.
- Maternal age, gravidity, and history of any previous section do not affect perinatal outcomes.
- A history of two or more previous scars shows a higher rate of prematurity.

Recommendations

Based on the findings of the present study, the following recommendations are proposed:

Strengthening Antenatal Screening and Risk Assessment

- Pregnant women with a history of previous cesarean section, particularly those with two or more cesarean scars, should be considered high-risk pregnancies and closely monitored throughout antenatal care.
- Early ultrasound screening should be routinely performed to identify placenta previa and possible placenta accreta spectrum disorders, allowing timely referral and management.

Reducing Unnecessary Cesarean Deliveries

- Healthcare providers should promote evidence-based indications for primary cesarean section to reduce the long-term risk of placenta previa and its associated complications in subsequent pregnancies.

Improving Management of High-Risk Cases

- Women with placenta previa and multiple previous cesarean scars should be managed in tertiary care hospitals with access to experienced obstetricians, anesthesiologists, blood bank services, neonatal intensive care units, and multidisciplinary teams.

Special Attention to Grand Multigravida Women

- Grand multigravida women should receive enhanced antenatal surveillance because of their increased risk of emergency cesarean section, hysterectomy, and bladder injury.
- Counseling regarding the risks associated with repeated pregnancies and high parity should be incorporated into maternal healthcare services.

Future Research

- Prospective multicenter studies are recommended to further investigate risk factors, maternal outcomes, and neonatal outcomes of placenta previa in Libya.
- Future research should evaluate the association between placenta previa and placenta accreta spectrum disorders, as well as the effectiveness of preventive and management strategies in improving outcomes.

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