

Maternal Risk Factors & Perinatal Outcomes in Women with Placenta Previa: A Cross Sectional Study

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Abstract

Background and objectives: Placenta previa is one of the main factors in adverse maternal and neonatal outcomes. This study was conducted to determine risk factors for placenta previa and subsequent maternal and perinatal outcomes.

Methods: This cross sectional study was conducted at Maternity Teaching Hospital, Erbil City, Kurdistan region, Iraq, from August 2020 to August 2021. Sixty Patients with placenta previa who presented with antepartum hemorrhage after 24 weeks of gestational age were included in the study. Participants underwent complete obstetrical and clinical assessment including history of risk factors, general physical, abdominal and pelvic examinations. Imaging methods used included transabdominal and transvaginal ultrasound. Patients were managed according to maternal and fetal conditions, and any maternal and fetal complications were recorded.

Results: previous history of placenta previa was observed in 16.7% and previous cesarean section in 60% of women. Maternal outcome was good in majority (91.7%) of cases. Hysterectomy was performed on two women (3.3%). Emergency caesarean section was performed on 58.3% of women, and elective caesarean section was performed on 36.7% of women and neonatal death rate was 66.7% among those delivered by spontaneous vaginal delivery. Greater gestational age, lesser neonatal death rate. Women with grade IV placenta previa had worse neonatal and maternal outcomes than women with lower grades of placenta previa.

Conclusion: A higher incidence of placenta previa is seen in patients with previous cesarean section, advanced maternal age, and high parity. No significant association was detected between neonatal outcomes and maternal risk factors.

Key words: Maternal risk factors ; Maternal outcomes ; Neonatal; Placenta previa.

Introduction

Placenta previa is a well-recognized cause of adverse perinatal and maternal outcomes and severe late-term vaginal bleeding¹. A pregnancy complicated by major placenta previa has more adverse effects than minor placenta previa during the antenatal, natal, and postnatal period.² The global incidence of placenta previa is 3–5% per thousand pregnancies, and this rate has been increasing concomitantly

with an increase in the rate of cesarean section (CS).³ Predisposing risk factors for placenta previa include previous CS; advanced maternal age; multiparity; multiple pregnancies; smoking; subfertility and assisted reproductive techniques; and obstetrical history of surgically managed miscarriage or manual removal of retained placenta due to injury to the decidua basalis and myometrium caused by these

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maneuvers.⁴⁻⁶ Cesarean delivery is the most common cause of damage to the myometrium and endometrium.⁷ The pathophysiology underpinning the causal association between placenta previa and advanced maternal age may be explained by atherosclerotic and infarction changes occurring in the uterus as a result of under-perfusion of the placenta and enlargement of the placental size. Despite multiple gestation being considered a risk factor for placenta previa, recent studies have failed to find a causal relationship between multiple gestation and placenta previa.⁸ There is no consensus on the role of previous miscarriages in increasing the risk of placenta previa in subsequent pregnancies; some studies found that previous miscarriages increase the risk of placenta previa while others did not find any association.⁹ Pregnancies complicated by placenta previa are more prone to

Patients and methods

This cross-sectional study of the risk factors of placenta previa took place at the Maternity Teaching Hospital, Erbil City, Kurdistan region, Iraq, from August 2020 to August 2021. The number of women included was 60. Sixty pregnant women who presented with antepartum hemorrhage after 24 weeks of gestation and were diagnosed with placenta previa by ultrasound were included in the study. Exclusion criteria included pregnant women with bleeding before 24 weeks of gestation, antepartum hemorrhage due to causes other than placenta previa, and women who refused to participate in the study. Data collection was performed by the researchers through direct interviews with the women who were included in the study and completion of a prepared questionnaire. The patients included in the study underwent complete obstetrical and clinical assessment including taking a history of risk factors and performing general, physical, pelvic and abdominal examinations. The imaging methods used included transabdominal and transvaginal

maternal morbidity and mortality including antepartum hemorrhage, postpartum hemorrhage, requirement for blood transfusion, hysterectomy and sepsis. Placenta previa has also been associated with adverse fetal outcomes including prematurity low Apgar score, admission to the neonatal intensive care unit, neonatal anemia, respiratory distress syndrome, hyperbilirubinemia, intrauterine growth restriction and small for gestational age. It is thought that decreased placental surface and inadequate circulation are responsible for the adverse fetal outcomes in placenta previa.¹⁰ The purpose of this study was to determine the maternal and perinatal outcomes associated with placenta previa. Specific objective of this study; to determine the risk factors of placenta previa, the effect of placenta previa on the mother's health, neonatal outcome and to specify mode of delivery.

ultrasound. Patients were managed according to maternal and fetal conditions, and any maternal and fetal complications were recorded. The data was recorded via a specially designed questionnaire and collected and entered into a computer via an Excel Worksheet using Microsoft Excel version 2010 (Microsoft Corp., Redmond, Washington, USA). The data was analyzed statistically using the Statistical Package for Social Sciences (SPSS) version 25 (IBM Corp., Armonk, N.Y., USA). Fisher's exact test was used instead of the Chi square test of association when the expected frequency value was less than 5 or more than 20% of the cells of the table. A p value of ≤ 0.05 was considered as statistically significant. The Ethics and Scientific Committee of Kurdistan Board of Medical Specialties approved this study November 2, 2020 (number 2473). At the time of the first interview, written informed consent was obtained from each woman who agreed to participate in this study. All participants were assured that their information would be kept

confidential and would be used for research purposes only. All interviews were carried out in accordance with the

Results

Sixty women with placenta previa were included in the study. Their mean age was 32.4 ± 6.9 years (17 - 44 years). More than half were multiparous women. The largest proportions of the sample were over-weight. A previous history of placenta previa was observed in 16.7% and CS in 60% of the women. Dilatation and curettage procedure in 9% of women. The placenta previa was classified as Grade III in 43.3%, Grade II in 28.3%, and Grade IV in 26.7% of the women. A Grade I placenta previa was observed in one woman (1.7%). The maternal outcome was good in the majority (91.7%) of cases. Hysterectomy was performed on two women (3.3%). Emergency CS was

performed on 58.3% of women, and elective CS was performed on 36.7% of the women. No significant association was detected between the neonatal outcomes and the following factors: age, parity, previous history of placenta previa, previous CS, previous uterine myomectomy, multiple gestations in current pregnancy, smoking, and previous diagnostic curettage (Table 1). Table (1) shows that the neonatal death rate was 66.7% among those delivered by spontaneous vaginal delivery. The greater the gestational age, the lesser the neonatal death rate ($p < 0.001$). There was a significant association between the mother's BMI and neonatal outcome.

Table (1): Perinatal outcomes by risk factors.

Maternal risk factors	No. of patients	Alive with normal Apgar score No. (%)	Low Apgar score and ICU admission No. (%)	Stillbirth or neonatal death No. (%)	p value
Age (years)					
<25	9	4 (44.5)	2 (22.2)	3 (33.3)	0.405*
25-34	24	17 (70.8)	5 (20.8)	2 (8.4)	
35-44	27	16 (59.3)	8 (29.6)	3 (11.1)	
Parity					
Primi-gravida	14	8 (57.1)	4 (28.6)	2 (14.3)	0.588*
Multi-parous	34	23 (67.6)	6 (17.6)	5 (14.7)	
Grand-multiparous	12	6 (50)	5 (41.7)	1 (8.3)	
Previous history of placenta previa					
No	50	31 (62)	12 (24)	7 (14)	0.885*
Yes	10	6 (60)	3 (30)	1 (10)	
Previous Cesarean section					
No	24	13 (54.2)	7 (29.2)	4 (16.6)	0.595*
Yes	36	24 (66.7)	8 (22.2)	4 (11.1)	
Previous uterine myomectomy					
No	54	35 (64.8)	12 (22.2)	7 (13)	0.237*
Yes	6	2 (33.3)	3 (50)	1 (16.7)	
Multiple gestation in current pregnancy					
No	58	36 (62.1)	14 (24.1)	8 (13.8)	0.624*
Yes	2	1 (50)	1 (50)	0 (0)	
Smoking					
No	53	34 (64.2)	13 (24.5)	6 (11.3)	0.289*
Yes	7	3 (42.9)	2 (28.6)	2 (28.5)	
Previous diagnostic curettage					

No	51	31 (60.8)	13 (25.5)	7 (13.7)	
Yes	9	6 (66.7)	2 (22.2)	1 (11.1)	>0.999*
Maternal risk factors	No. of patients	Alive with normal Apgar score	Low Apgar score and ICU admission	Stillbirth or neonatal death	p value
		No. (%)	No. (%)	No. (%)	
Mode of delivery					
Spontaneous vaginal delivery	3	1 (33.3)	0 (0)	2 (66.7)	
Elective Cesarean section	22	22 (100)	0 (0)	0 (0)	
Emergency Cesarean section	35	14 (40)	15 (42.9)	6 (17.1)	<0.001*
Placenta previa in current pregnancy					
Grade I	1	1 (100)	0 (0)	0 (0)	
Grade II	17	17 (100)	0 (0)	0 (0)	
Grade III	26	15 (57.7)	9 (34.6)	2 (7.7)	
Grade IV	16	4 (25)	6 (37.5)	6 (37.5)	<0.001*
Gestational age at delivery					
Extreme preterm (<28 weeks)	3	0 (0)	0 (0)	3 (100)	
Very preterm (28–31 weeks)	9	0 (0)	5 (55.6)	4 (44.4)	
Moderate or late preterm (32–36 weeks)	28	17 (60.7)	10 (35.7)	1 (3.6)	
Term (≥37 weeks)	20	20 (100)	0 (0)	0 (0)	<0.001*
BMI (Kg/m ²)					
18.5–24.9	5	1 (20)	2 (40)	2 (40)	
25–29	25	21 (84)	3 (12)	1 (4)	
30–34.9	20	11 (55)	6 (30)	3 (15)	
35–39.9	8	4 (50)	3 (37.5)	1 (12.5)	
≥40	2	0 (0)	1 (50)	1 (50)	0.019*
Total	60	37 (61.7)	15 (25)	8 (13.3)	

*By Fisher's exact test.

Table (2) shows the rate of poor outcomes was significantly higher among smokers. Around one-third (31.3%) women with a Grade IV placenta previa.

Table (2): Maternal outcomes by risk factors.

Maternal risk factors	No. of patients	Maternal outcome		p value
		Good	Poor	
		No. (%)	No. (%)	
Age (years)				
<25	9	9 (100)	0 (0)	
25–34	24	24 (100)	0 (0)	

35–44	27	22 (81.5)	5 (18.5)	0.057*
Parity				
Primi-gravida	14	14 (100)	0 (0)	
Multi-parous	34	32 (94.1)	2 (5.9)	
Grand-multiparous	12	9 (75)	3 (25)	0.063*
History of placenta previa				
No	24	23 (95.8)	1 (4.2)	
Yes	36	32 (88.9)	4 (11.1)	0.639*
Previous uterine myomectomy				
No	54	50 (92.6)	4 (7.4)	
Yes	6	5 (83.3)	1 (16.7)	0.421*
Multiple gestation				
No	58	53 (91.4)	5 (8.6)	
Yes	2	2 (100)	0 (0)	>0.999*
Smoking				
No	53	51 (96.2)	2 (3.8)	
Yes	7	4 (57.1)	3 (42.9)	0.009*
Previous diagnostic curettage				
No	51	47 (92.2)	4 (7.8)	
Yes	9	8 (88.9)	1 (11.1)	0.570*
Maternal risk factors	No. of patients	Maternal outcome		p value
		Good	Poor	
		No. (%)	No. (%)	
Mode of delivery				
Spontaneous vaginal delivery	3	3 (100)	0 (0)	
Elective CS	22	22 (100)	0 (0)	
Emergency CS	35	30 (85.7)	5 (14.3)	0.190*
Placenta previa				
Grade I	1	1 (100)	0 (0)	
Grade II	17	17 (100)	0 (0)	
Grade III	26	26 (100)	0 (0)	
Grade IV	16	11 (68.8)	5 (31.3)	0.002*
Total	60	55 (91.7)	5 (8.3)	

*By Fisher's exact test. CS, cesarean section

Discussion

Placenta previa is a well-known factor in the development of adverse maternal and neonatal outcomes and the most frequent cause of vaginal bleeding during late pregnancy. In this study, we found that a previous history of CS was the most identifiable risk factor for placenta previa (60%) due to endometrial and myometrial scarring; this result was consistent with a prospective cross-sectional study conducted by Salim et al (69.23%).¹¹ Advanced maternal age increased the risk

of placenta previa as demonstrated by the fact that the largest proportion of women diagnosed with placenta previa in our study were between 35–44 years (45%); this finding was similar to that of an unmatched case-control study by Adere et al (six fold increased the risk of placenta previa). Atherosclerotic changes in the uterus may cause under-perfusion and infarction of the placenta as a result of an increased placental size.¹² In the current study more than half (56.7%) of study

population were multiparous women. A prospective two-year study by Prasanth et al showed similar results.¹³ In our study, women with placenta previa had a higher rate of emergency CS (58.3%) and elective CS was performed for 36.7% of the women; a similar result was reported by a retrospective cohort study conducted in Northern Tanzania, and the study showed that the participants with placenta previa had a 10-fold higher rate of caesarean delivery than the participants without placenta previa.¹⁴ The current study revealed that those who underwent emergency CS experienced adverse neonatal outcomes while those who underwent elective CS experienced no adverse neonatal outcomes ($p < 0.001$); similar results were published by Ozkose et al.¹⁵ Placenta previa was associated with a low birth weight (< 2500 g) in more than one-third deliveries, and the Apgar score in the first minute was severely depressed in 21.7% and moderately depressed in 35% of the newborns; this may be due to prematurity as only one-third deliveries were full-term. Similar results regarding low birth weight were published by a prospective study conducted by Hamdy et

Conclusion

This study's findings indicate that a previous history of CS is the most common risk factor for placenta previa followed by advanced maternal age, multiparity, and previous history of placenta previa. Women with grade IV placenta previa had worse maternal and neonatal outcomes than women with lower

Conflicts of interest

The author reports no conflicts of interest.

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al.¹⁶ In our study, no neonatal deaths occurred among women with Grade I and Grade II placenta previa (Minor previa), while the death rates were 7.7% and 37.5% among women with Grade III and Grade IV placenta previa, respectively ($p < 0.001$). From our data, it is evident that the greater the gestational age, the less the neonatal death rate. A study conducted by Sekiguchi et al. reported a higher incidence of preterm delivery in women with major placenta previa compared to women with minor placenta previa (41.5% versus 8.8%, respectively).¹⁷ Sabra et al. reported on the association between smoking and adverse maternal outcomes in placenta previa cases; the reduced oxygen supply in patients who smoked caused placental hypoxia that provoked changes in the placental vasculature and uterine wall invasion as a triage to maintain blood supply to the fetus.¹⁸ Around one third (31.3%) of women with Grade IV placenta previa (Major previa) had a bad maternal outcome, such as post-partum hemorrhage and blood transfusion ($p = 0.002$), which was similar to a study conducted by Gronval et al.¹⁹

grades of placenta previa did. Its recommended from this study during pregnancy antenatal check should be done regularly so as to screen for the risk factors earlier in order to avoid adverse effect of placenta previa on perinatal and maternal outcome .

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