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Original Article

Maternal Morbidity and Complications Following Cesarean Hysterectomy in Placenta Previa

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ABSTRACT

Background: *Placenta previa, particularly when associated with prior cesarean deliveries, poses a high risk for massive hemorrhage and may necessitate cesarean hysterectomy. In low-resource settings, the management of such cases is further complicated by limited antenatal care and referral systems. The objective of the study is to assess maternal morbidity and complications following cesarean hysterectomy in placenta previa patients in a tertiary hospital in Bangladesh.* ***Methods & Materials:*** *This observational cross-sectional study included 50 patients diagnosed with placenta previa over a six months period. Data on patient demographics, risk factors, surgical history, intraoperative events, postoperative complications, and neonatal outcomes were collected and analyzed descriptively.* ***Results:*** *Among the 50 placenta previa cases, 10 (20%) required cesarean hysterectomy. Of these, 60% had ≥2 prior cesarean sections and 50% had central placenta previa. All hysterectomy patients required blood transfusion, with 30% needing more than five units. Postoperative complications occurred in 50% of hysterectomy cases, including wound infection (20%) and DIC (10%). Neonatal outcomes revealed 30% low birth weight and 24% NICU admissions.* ***Conclusion:*** *Cesarean hysterectomy in placenta previa is associated with significant maternal and neonatal morbidity, particularly among women with prior cesarean scars. Improving antenatal care and surgical preparedness is critical to reduce adverse outcomes in such high-risk pregnancies.*

Keywords: *Placenta previa, Cesarean hysterectomy, Maternal morbidity, Blood transfusion, Perinatal outcome*

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INTRODUCTION

In recent decades, the global rate of cesarean section has risen sharply, transforming obstetric practice but also bringing with it a rise in life-threatening complications such as placenta previa and placenta accreta. According to Solheim et al., the global cesarean delivery rate increased from 6.7% in 1990 to over 21.1% by 2010, with projections suggesting rates could exceed 30% in several countries within the next decade[1]. This trend has directly contributed to a parallel rise in abnormal placentation, particularly placenta previa and its more severe variant—placenta accreta spectrum (PAS)—which are now recognized as major contributors to maternal morbidity and mortality[2]. Placenta previa, defined as the implantation of the placenta in the lower uterine segment covering or approaching the internal cervical os, can be categorized into complete, partial, marginal and low-lying types depending on the degree of cervical coverage[3]. The combination of placenta previa and abnormal placental adherence, such as accreta, increta, or percreta, frequently leads to uncontrollable hemorrhage, necessitating emergent cesarean hysterectomy to save maternal life[4,5]. Placenta previa has emerged as one of the leading causes of antepartum hemorrhage worldwide, with an estimated incidence of 4 per 1,000 pregnancies, though rates may be higher in high-parity populations and settings with elevated cesarean delivery rates[6]. The burden of placenta previa is particularly alarming when coupled with placenta accreta spectrum disorders, where placental villi abnormally invade the myometrium and surrounding organs. As demonstrated in a large clinical analysis, more than two-thirds of women with placenta previa experience moderate to severe antepartum bleeding, and up to one in four may require cesarean hysterectomy[7]. When conservative surgical measures fail to control hemorrhage, hysterectomy becomes not only inevitable but potentially lifesaving[8,9]. These procedures are often emergent, carried out under unstable hemodynamic conditions, and associated with significant intraoperative complications including bladder injuries, excessive transfusion requirements, and prolonged surgical time[10,11]. Maternal morbidity associated with placenta previa is profound. Women with this condition are at markedly increased risk of postpartum hemorrhage, shock, disseminated intravascular coagulation, and blood transfusion[12]. Gupta et al. found that peripartum

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hysterectomy was required in 15.9% of cases with placenta previa, with 37.5% experiencing primary postpartum hemorrhage and 18.2% of neonates succumbing to perinatal death[13]. Fetal complications are equally severe, with heightened risks of intrauterine growth restriction, low birth weight, neonatal intensive care unit (NICU) admissions, and premature delivery, particularly in emergency cases[14,15]. In low-resource settings, these risks are exacerbated by delay in diagnosis, inadequate prenatal care, and limitations in blood banking and NICU infrastructure[16]. Bangladesh presents a particularly vulnerable context for placenta previa-related complications. Studies from tertiary centers in urban Bangladesh reveal that a substantial proportion of women with placenta previa do not receive any antenatal care, and many present only after significant bleeding has occurred[17,18]. This delayed presentation often results in preventable morbidity, including a high rate of peripartum hysterectomy, blood transfusion, and neonatal deaths[19,20]. Despite technological advancements in high-income countries that allow for early ultrasound diagnosis and preventive planning, the reality in resource-limited settings is starkly different. Here, the lack of routine prenatal imaging and poorly coordinated referral networks mean that cases of placenta previa, particularly with accreta, are often diagnosed only intraoperatively or during an emergency, leading to unavoidable complications[21]. The linkage between prior cesarean sections and placenta previa is well established. Prior uterine scarring, particularly with two or more previous cesareans, significantly raises the risk of abnormal placentation and consequently, the need for peripartum hysterectomy[10,22]. When these cases evolve into placenta percreta or involve surrounding organs like the bladder, surgical complexity and maternal risk increase substantially. Emergency cesarean hysterectomy, while often life-saving, is associated with longer operative times, higher blood transfusion volumes, and greater rates of injury compared to elective procedures[23]. Given the escalating rates of cesarean sections, the increasing incidence of placenta previa and accreta, and the high risk of hemorrhage and maternal-fetal complications—especially in under-resourced healthcare systems—this study aims to assess maternal morbidity and perioperative complications following cesarean hysterectomy in patients with placenta previa in a tertiary hospital in Bangladesh. By identifying clinical patterns, risk factors, and surgical outcomes, this research seeks to contribute to the existing literature and inform future obstetric care practices in resource-limited settings.

METHODS & MATERIALS

This was a hospital-based, observational cross-sectional study conducted at the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital, Bangladesh, over a six months period from July 2017 to December 2017. The study included all pregnant women admitted with a diagnosis of placenta previa, either confirmed clinically or through ultrasonographic evaluation, who subsequently underwent cesarean delivery. Among these, cases that required cesarean hysterectomy due to uncontrollable hemorrhage or morbid placental adherence were identified and analyzed. Exclusion criteria included patients with incomplete records, co-existing uterine rupture, or hysterectomy for non-obstetric indications. Data were collected using a structured checklist and extracted from hospital records, operative notes, and postoperative follow-ups. Variables included socio-demographic characteristics, antenatal care details, type of placenta previa, prior cesarean history, intraoperative findings, blood transfusion requirements, and maternal and fetal outcomes. The presence of placenta accreta spectrum was noted based on intraoperative findings and histopathology where available. All data were analyzed using descriptive statistics with frequencies, percentages, and means presented where applicable. Ethical clearance for the study was obtained from the institutional review board, and patient confidentiality was maintained throughout the study.

RESULTS

Table – I: Baseline characteristics distribution among the participants (*n*=50)

Patient characteristic	Frequency	Percentage
Age in years		
<30 year	9	18%
31- 35 year	10	20%
>35 years	31	62%
Education		
No Education	15	30%
Primary	12	24%
Secondary	14	28%
Higher Secondary	9	18%
Occupation		
Housewife	34	68%
Service	15	30%
Day laborer	1	2%
Others	0	0%
Monthly income (taka)		
5000-10,000	11	22%
10,001-15,000	13	26%
15,001- 20,000	18	36%
>20,001	8	16%
Residence		
Urban Slum	13	26%
Urban	21	42%
Rural	16	32%
Gestational Age		
<33 weeks	5	10%
33-37 weeks	20	40%
>37 weeks	25	50%

A total of 50 patients who underwent cesarean hysterectomy for placenta previa were included in the study. The majority of participants (62%) were aged above 35 years, while 20% were between 31–35 years and 18% were under 30. Educational attainment varied, with 30% of women having no formal education, 24% completing primary education, 28% secondary education, and 18% higher secondary level. Most participants (68%) were housewives, whereas 30% were employed in service-related jobs and 2% were day laborers.

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Regarding monthly household income, 36% of participants reported earnings between 15,001–20,000 BDT, followed by 26% earning 10,001–15,000 BDT, 22% earning below 10,000 BDT, and 16% reporting income above 20,001 BDT. In terms of residence, 42% of the patients were from urban areas, 32% from rural settings, and 26% from urban slums. The gestational age at delivery was above 37 weeks in half of the cases (50%), 40% delivered between 33–37 weeks, and 10% delivered before 33 weeks.

Table – II: Antenatal Care and P/V Bleeding Status of the Patients (*n*=50)

Variables	Frequency	Percentage
Antenatal check up		
Regular	10	20%
Irregular	23	46%
Never received	17	34%
P/V bleeding		
No bleeding	13	26%
Mild	18	36%
Moderate	10	20%
Severe	9	18%

In terms of antenatal care, only 20% of the patients had regular antenatal check-ups, while 46% received irregular care and 34% had no antenatal visits at all. Regarding per vaginal (P/V) bleeding during pregnancy, 26% of the women reported no bleeding, whereas 36% experienced mild bleeding, 20% had moderate bleeding, and 18% suffered from severe P/V bleeding prior to delivery.

Table – III: Risk Factors for Placenta Previa (*n*=50)

Risk factors	Frequency	Percentage
Parity		
0	4	8%
1-2	20	40%
>2	26	52%
Previous CS		
1	14	28%
2 or more	21	42%
Previous curettage	9	18%
Previous uterine surgery	4	8%

Analysis of obstetric risk factors revealed that more than half of the patients (52%) had a parity greater than two, while 40% had one or two prior deliveries, and 8% were nulliparous. A significant proportion had a history of cesarean sections, with 42% having undergone two or more previous cesarean deliveries and 28% reporting one prior cesarean. Additionally, 18% of the participants had a history of uterine curettage, and 8% had undergone previous uterine surgeries unrelated to cesarean delivery.

Table – IV: Occurrence of Cesarean Hysterectomy among Placenta Previa Patients (*n*=50)

Category	Subcategory / Details	n	%
All Placenta Previa Cases		50	100%
Cesarean Hysterectomy among Placenta Previa		10	20%
Type of Placenta Previa (among the 10 hysterectomies)	Type I I Anterior with Accreta	2	20%
	Type III	3	30%
	Central Placenta Previa	5	50%
History of Previous Cesarean (among the 10 hysterectomies)	None (Only Vaginal Delivery)	1	10%
	1 Previous Cesarean	3	30%
	≥2 Previous Cesareans	6	60%

Out of the 50 patients with placenta previa, 10 cases (20%) required cesarean hysterectomy. Among these hysterectomy cases, the most common type of placenta previa was central placenta previa, observed in 50% of cases, followed by Type III in 30% and Type II anterior with placenta accreta in 20%. When examining previous cesarean history among the hysterectomy patients, 60% had a history of two or more prior cesarean sections, 30% had one previous cesarean, and only 10% had no prior cesarean history, having delivered vaginally in the past.

Table – V: Blood transfusion among the patients of Cesarean hysterectomy (*n*=10)

Blood transfusion	Frequency	Percentage
<2 bags	2	20%
2-5 bags	5	50%
>5 bags	3	30%

Among the 10 patients who underwent cesarean hysterectomy, all required blood transfusions. Half of the patients (50%) received between 2 to 5 bags of blood, while 30% required more than 5 bags, indicating significant intraoperative blood loss. The remaining 20% received less than 2 bags of blood.

Table – VI: Postoperative Complications in Cesarean Hysterectomy Patients (*n*=10)

Postoperative complications	Frequency	Percentage
Uneventful	5	50%
DIC	1	10%
Wound infections	2	20%
Blood transfusion reactions	1	10%
Psychiatric disturbances	1	10%

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Among the 10 patients who underwent cesarean hysterectomy, half of the cases (50%) had an uneventful postoperative course. However, complications were observed in the remaining 50%, including wound infections in 20% of patients, disseminated intravascular coagulation (DIC) in 10%, blood transfusion reactions in 10%, and psychiatric disturbances in 10% of the cases.

Table – VII: Perinatal Outcomes among the Placenta Previa Patients (*n*=50)

Outcome	Frequency	Percentage
Live birth	45	90%
Still birth	3	6%
IUD	2	4%
Low birth weight (<2.5 kg)	15	30%
NICU admission needed	12	24%

Among the 50 patients with placenta previa, live births occurred in 90% of the cases, while stillbirths and intrauterine deaths (IUD) were reported in 6% and 4% of cases, respectively. Low birth weight (<2.5 kg) was observed in 30% of the neonates, and 24% required admission to the neonatal intensive care unit (NICU), indicating a considerable burden of perinatal complications associated with placenta previa.

DISCUSSION

This study aimed to evaluate maternal morbidity and complications among patients undergoing cesarean hysterectomy for placenta previa in a tertiary care setting in Bangladesh. Out of 50 women diagnosed with placenta previa, 20% required cesarean hysterectomy—comparable to the 22.4% reported in a large cohort study in China, where prior cesarean deliveries and morbidly adherent placenta were dominant risk factors[24]. A Bangladeshi study by Akter et al. observed a similarly high hysterectomy rate of 36.5% in women with central placenta previa and prior cesareans, suggesting consistency across regional data[25]. In the current study, 62% of participants were over the age of 35, indicating the contribution of advanced maternal age to abnormal placental implantation. This aligns with the findings of Ammar et al., who reported that more than half of their patients with placenta previa were in the 31–40 year age group[26]. Moreover, a significant proportion (52%) of women in this study had high parity and 70% had a prior cesarean history, including 42% with two or more prior cesareans—well-established contributors to placenta previa and accreta. This trend is mirrored in the literature, where multiple studies have identified prior uterine surgeries and high parity as critical factors increasing the likelihood of abnormal placentation and subsequent surgical complications[27,28]. Only 20% of patients had received regular antenatal care, and 34% had no care at all. This highlights a critical public health gap, especially considering that timely antenatal ultrasound can detect placenta previa early and guide preemptive planning. Hasan et al. and Parvin et al. similarly emphasized the link between inadequate antenatal care and late presentation with hemorrhagic complications[29,30]. Per vaginal bleeding—a hallmark of placenta previa—was noted in 74% of our patients, with 18% experiencing severe hemorrhage, aligning with findings from Ammar et al., where one-third presented with vaginal bleeding and 12.7% were admitted in shock[26]. Among the hysterectomy cases in this study, 60% had a history of ≥2 prior cesareans and 50% were diagnosed intraoperatively with central placenta previa. A further 20% had Type II anterior placenta with accreta, underscoring the clinical overlap between central previa and abnormal placental invasion. Durdağ et al. found that anterior and central placenta previa—particularly over cesarean scars—significantly increase the risk of both hemorrhage and peripartum hysterectomy[31]. These findings are further substantiated by Bai et al., who demonstrated that morbid placental adherence over scarred tissue dramatically raises the odds of hysterectomy and poor maternal outcomes[32]. All patients undergoing hysterectomy in our cohort required blood transfusions, with 30% receiving more than five bags. This observation is consistent with results from Chumpathong, where 18.8% of placenta previa cases required transfusions, and those with prior cesareans or complete previa were at highest risk[28]. Zhou et al. similarly reported that women with prior cesareans accounted for over 90% of massive transfusion events in placenta previa cases[33]. In our study, the magnitude of transfusion aligns with values reported by Ciğerli and Saygılı, where emergency hysterectomy patients had significantly greater blood loss and transfusion volume than those undergoing planned procedures[23]. Postoperative complications were observed in 50% of the hysterectomy cases, including wound infections (20%), DIC (10%), transfusion reactions (10%), and psychiatric disturbances (10%). A similar burden was noted by Manzoor et al., who reported frequent ICU admissions, surgical injuries, and maternal morbidity[27]. Akter et al. also documented complications despite high uterus preservation rates, emphasizing that even conservative management in placenta previa can lead to significant surgical stress[25]. While 50% of our hysterectomy patients had uneventful postoperative recovery, these findings affirm the high-risk nature of cesarean hysterectomy and the importance of multidisciplinary readiness. Perinatal outcomes in this study revealed a 90% live birth rate, with 6% stillbirths and 4% intrauterine deaths. Additionally, 30% of newborns were of low birth weight and 24% required NICU admission. These results are broadly consistent with those of Rathi and Wagh (2020), who reported increased rates of low birth weight and preterm delivery in placenta previa[34]. Maiti et al. further demonstrated a significant association between placenta previa and NICU admissions, while Kanak and Gita emphasized that these outcomes were notably worse in cases complicated by prior cesareans and emergency surgeries[35]. Although no formal statistical analysis was conducted in this study, the observed trends—such as the correlation between prior cesarean sections and hysterectomy, or the burden of transfusion and postoperative complications—are consistent with well-established findings in the literature[24,32]. These patterns underscore the clinical reliability of our data and reflect a broader, globally recognized burden of placenta previa in high-parity, low-resource settings. Ultimately, this

study highlights the urgent need for improved antenatal care, early ultrasound screening, and blood bank preparedness in settings like Bangladesh, where the dual burden of maternal and neonatal risk remains high. With appropriate planning and multidisciplinary management, outcomes can be significantly improved—even in emergency hysterectomy cases.

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

This study highlights the substantial maternal and perinatal burden associated with placenta previa requiring cesarean hysterectomy, particularly in women with multiple prior cesarean sections and limited antenatal care access. A significant proportion of patients experienced major complications, including hemorrhage necessitating transfusion, postoperative infections, and disseminated intravascular coagulation. Perinatal outcomes were also adversely affected, with notable rates of low birth weight, NICU admissions, and perinatal losses. The findings reaffirm that advanced maternal age, high parity, and scarred uteri are critical risk factors in the development of morbidly adherent placenta and emergency surgical intervention. Early identification through routine antenatal surveillance, improved referral systems, and multidisciplinary perioperative preparedness are essential to mitigate maternal and neonatal morbidity. In resource-limited settings like Bangladesh, strengthening antenatal services and surgical readiness remains vital to reducing the high burden of cesarean hysterectomy-related complications in placenta previa.

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