Original Article

Cesarean Hysterectomy: A Retrospective Study on Incidence and Outcomes at Tertiary Care Hospital in Bangladesh

Banika Biswas[1], Swajal Chandra Das[2], Arshad Jahan Nasrin[3], Rahima Khatun[4]

Abstract

Background: Cesarean hysterectomy (CH) is a rare but life-saving procedure for uncontrolled obstetric hemorrhage, most frequently associated with placenta accreta spectrum (PAS). Rising cesarean rates have increased PAS incidence worldwide, yet data from Bangladesh remain limited.

Objective: To determine the incidence and outcomes of CH in a tertiary care hospital in Bangladesh.

Methods: This retrospective observational study was conducted at Ad-din Women's Medical College Hospital from January 1 to December 31, 2024. All lower uterine segment cesarean sections (LUCS) were reviewed, and CH cases identified. Maternal demographics, obstetric history, antenatal comorbidities, intraoperative findings, complications, and neonatal outcomes were recorded. Descriptive statistics were applied.

Result: Of 12,740 LUCS, 79 required CH (0.62%). Mean maternal age was 29.41 years; 34 (43%) were aged 26–30 years. Preterm delivery occurred in 44 (55.7%). PAS disorders were the leading indications: placenta increta 34 (43%), percreta 21 (27%), and accreta 17 (21%). Uterine rupture accounted for 7 (9%). Gestational diabetes was the most frequent antenatal comorbidity (18.9%). Intraoperative blood transfusion was required in 79 (100%), and 31 (39.2%) required ICU admission. Postoperative complications included urinary tract infection 19 (24.1%), surgical site infection 9 (11.4%), bladder injury 5 (6.3%), and disseminated intravascular coagulation 3 (3.8%). One maternal death (11.3%) occurred due to massive hemorrhage. Neonatal outcomes revealed 30 (38%) low birth weight, 4 (5%) intrauterine death, and 7 (8.9%) NICU admission.

Conclusion: CH was uncommon (0.62%) but carried significant maternal and neonatal morbidity. PAS was the predominant indication, reflecting the effect of prior cesarean deliveries. High transfusion rates and ICU needs highlight the importance of antenatal risk stratification, surgical preparedness, and multidisciplinary team involvement. Strengthening early diagnosis of PAS and ensuring adequate blood bank and critical care resources may improve outcomes in high-risk obstetric populations.

Keywords: Retrospective; Cesarean Hysterectomy; Tertiary Care Hospital; Placenta Accreta Spectrum; Obstetric Hemorrhage.

1. Associate Professor, Department of Obstetrics and Gynaecology, Ad-din Women's Medical College Hospital, Dhaka
2. Associate Professor, Department of Radiology and Imaging, Sylhet MAG Osmani Medical College Hospital, Sylhet
3. Associate Professor, Department of Obstetrics and Gynaecology, Gonoshasthya Samaj Vittik Medical College Hospital
4. Associate Professor, Department of Obstetrics and Gynaecology, Ad-din Women's Medical College Hospital, Dhaka

Correspondence: Dr. Banika Biswas, Associate Professor, Ad-din Women's Medical College Hospital, Dhaka. Email: bisbanika@gmail.com, Mobile: +8801712-140896

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Introduction

Cesarean hysterectomy (CH) is a life-saving procedure performed during or immediately after cesarean delivery to control life-threatening obstetric hemorrhage. In obstetric practice, it is indicated when severe bleeding, infection, or abnormal placentation cannot be managed by conservative measures.[1,2] Although historically rare, peripartum hysterectomy is now recognized as a maternal "near-miss" criterion by the World Health Organization (WHO).[1] Over recent decades, global cesarean delivery rates have risen sharply (from ~7% in 1990 to ~21% by 2023), contributing to increases in

complex placental disorders.[3] As a result, the incidence of hysterectomy for obstetric hemorrhage has also risen worldwide, with an overall incidence of ~0.9 per 1,000 deliveries, with marked geographic variation found in a 2016 systematic review. For instance, rates are <0.2 per 1,000 in Scandinavia but exceed 10 per 1,000 in South Asia.[1] Low- and middle-income countries generally see higher peripartum hysterectomy rates than high-income countries.[1,2]

Major indications for CH include intractable postpartum hemorrhage and abnormal placentation. Abnormal placentation (placenta previa/accreta spectrum, PAS) has emerged as the leading risk factor for peripartum hysterectomy.[1,2] Globally, PAS incidence has risen in parallel with the cesarean rate. For example, placenta accreta spectrum is now seen in up to 1–3 per 1,000 deliveries, having increased 3 to 4-fold in recent decades.[4,5] The risk of PAS rises steeply with each prior cesarean delivery (with reported prevalence from ~0.3% after one cesarean to >6% after five cesareans) and with placenta previa.[5] In addition to PAS, other major indications for CH include severe uterine atony refractory to medical management, uterine rupture, abruption, and invasive placental pathology.[1,4] Risk factors for CH therefore include higher maternal age, multiparity, multiple gestation, placenta previa, and prior uterine surgery.[4,6] Notably, as cesarean prevalence rises, uterine atony is becoming a less common indication, while morbidly adherent placentae account for more cases of CH in many settings.[7]

The consequences of cesarean hysterectomy for women are severe. It invariably results in loss of fertility and is associated with high maternal morbidity and even mortality. Massive blood transfusion is usually required: in one series, all CH patients received transfusions, and newer analyses show a significant burden of ICU care and organ support after CH.[8] Maternal mortality rates differ by setting, but are substantially higher in low-resource settings. For instance, in one large review, the risk of death following CH was ~12% in low-income settings versus <2% in high-income settings.[1] Reported maternal deaths after CH range up to ~8–10% in South Asia and Africa.[8,9] Obstetric hemorrhage remains a leading cause of maternal death worldwide, accounting for about one-third of deaths in South Asia, including Bangladesh. Placenta previa and PAS together cause over half of antepartum hemorrhage cases and are prominent precursors to CH.[10] In high-volume centers, CH is often performed under multidisciplinary protocols, but in many low-resource settings such protocols are lacking, contributing to worse outcomes.

Regionally, South Asian countries share these challenges. A Nepalese tertiary center reported CH in 0.074% of deliveries (~0.74 per 1,000), with PAS the indication in 62% of cases.[7] In Bangladesh, few studies have focused on cesarean hysterectomy specifically. One tertiary study in Dhaka found an emergency peripartum hysterectomy rate of 0.625% (6.25 per 1,000), and another similar study reported 0.408% (4.08 per 1,000).[11] These rates appear higher than some high-income settings but similar to other South Asian series. For comparison, the incidence at a Romanian center was 0.099% (0.99 per 1,000), while a new Ethiopian cohort saw 5.2 per 1,000.[2,9] The leading causes in South Asia are increasingly placenta previa and accreta, whereas older reports from the region often noted atony and uterine rupture as main reasons.[7]

In Bangladesh, cesarean delivery rates have increased dramatically, from ~3% in 2000 to ~24% by 2014. Despite this rise, maternal mortality has not declined proportionately.[6] Postpartum hemorrhage is still the top cause of maternal death, with ~31% of Bangladeshi maternal deaths attributable to hemorrhage. Within hemorrhage-related deaths, placental causes (previa/accreta) and uterine rupture are major contributors.[10] Few local data exist on CH outcomes. A recent review in a tertiary Dhaka hospital found that CH often follows massive hemorrhage, with high transfusion needs and morbidity.[12] Given limited blood bank resources and critical care capacity, CH poses a serious burden on Bangladeshi obstetric care.

Despite the clinical importance of CH, a few studies have quantified the incidence and maternal outcomes of CH specifically in Bangladesh. To address this, we conducted a retrospective analysis of all cesarean hysterectomies in our tertiary care hospital. The objective of this study was to determine the incidence of CH among deliveries, describe its indications, and evaluate maternal outcomes.

Materials and Methods

This retrospective observational study was conducted at Ad-din Women's Medical College Hospital, Bangladesh. The study included all patients who underwent lower uterine segment caesarean section (LUCS) from January 1, 2024, to December 31, 2024. Among the patients who underwent LUCS, cases that required caesarean hysterectomy were identified. Any hysterectomy other than cesarean were excluded from this study.

Data were collected for further study. Variables included maternal age, gestational age, antenatal comorbidities, perioperative events, postoperative complications, and maternal and neonatal outcomes. Neonatal outcomes included birth weight, sex, intrauterine death, and need for NICU admission. Maternal outcomes included perioperative events (blood transfusion, ICU support), postoperative complications, and mortality.

Data were obtained from hospital records and operation theater registers, entered into Microsoft Excel, and analyzed using SPSS version 27. Descriptive statistics were presented as frequencies, percentages, and means where appropriate. Ethical clearance for this study was obtained from the Institutional Review Board of the medical college.

Continuous variables (e.g., maternal age) were expressed as mean ± standard deviation, while categorical variables were expressed as frequencies and percentages. As this was a single-group descriptive case series without a comparator arm, only descriptive statistical analysis was performed; no inferential statistical tests were applied.

Result

Table 1 shows A total of 12,740 LUCS were performed in the Ad-din Women's Medical College Hospital, Bangladesh, in 2024, of which 79 (0.62%) underwent cesarean hysterectomy. Among the 79 patients who underwent caesarean hysterectomy, the mean maternal age was 29.41 years. Where most women women aged 26–30 years- 34 (43%). The majority of cases were preterm deliveries 44 (55.7%), and 35 (44.3%) were term. Antenatal comorbidities included gestational diabetes mellitus 15 (18.9%), gestational hypertension 3 (3.8%), and hypothyroidism 4 (5%). Regarding obstetric history, 2 (2.5%) had no previous caesarean section, 26 (32.9%) had one, 32 (40.5%) had two, and 19 (24.1%) had three or more previous caesarean sections.

Table 1: Maternal Demographics and Antenatal Profile

Category		Frequency (%)
Age (years)	≤ 20	1 (1.3)
	21–25	14 (17.7)
	26–30	34 (43)
	31–35	23 (29.1)
	36–40	7 (8.9)
	Mean Age	29.41 years
Pregnancy Duration	Preterm	44 (55.7)
	Term	35 (44.3)
	Post-term	0 (0)
Antenatal	GDM	15 (18.9)
Co-morbidities	GHTN	3 (3.8)
	Hypothyroidism	4 (5)
History of previous	None	2 (2.5)
C/S	One	26 (32.9)
	Two	32 (40.5)
	Three	19 (24.1)

Preoperatively, 43% of the patients had placenta increta, 27% had placenta percreta, and 21% had placenta accreta. Ruptured uterus was identified in cases 9% (Pie chart 1).

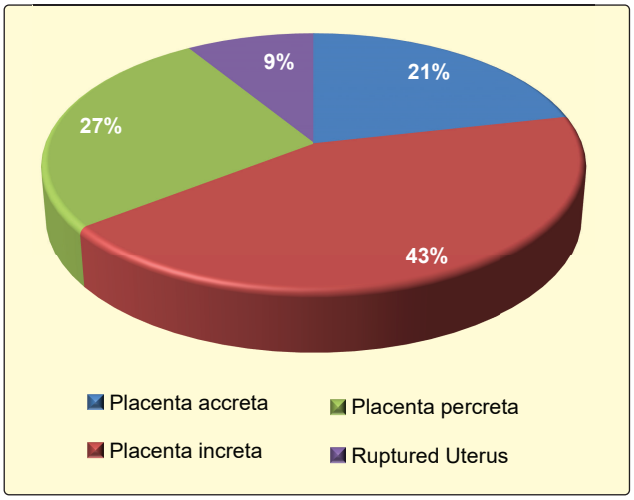

Chart 1: Peroperative Key findings

In Table 2, perioperative events showed that 79 (100%) women required blood transfusions, and 31 (39.2%) required ICU support. Postoperative complications included urinary tract infection 19 (24%), surgical site infection 9 (11.4%), bladder injury 5 (6.3%), disseminated intravascular coagulation 3 (3.8%), perioperative cardiac arrest 3 (3.8%), renal failure 2 (2.5%), multi-organ failure 2 (2.5%), and re-laparotomy 2 (2.5%). There was one maternal death 1 (1.3%).

Table 2: Perioperative and Postoperative Events and Complications

Category	Frequency (%)
Events	
Blood Transfusion	79 (100)
ICU support	31 (39.2)
Complications	
UTI	19 (24)
Surgical site infection	9 (11.4)
Bladder Injury	5 (6.3)
DIC	3 (3.8)
Perioperative Cardiac Arrest	3 (3.8)
Renal Failure	2 (2.5)
Multi Organ Failure	2 (2.5)
Re-laparotomy	2 (2.5)
Death	1 (1.3)

Regarding neonatal outcomes, Table 3 shows, 30 (38%) of newborns were of low birth weight, 47 (59.5%) had normal birth weight, and 2 (2.5%) were macrosomic. The male-to-female ratio was nearly equal: 37 (46.8%) vs. 42 (53.2%). 4 (5%) intrauterine deaths were recorded, and 7 neonates (8.9%) required NICU admission.

Table 3: Baby Outcome

Category		Frequency (%)
Birth Weight	Low Birth Weight (LBW)	30 (38)
	Normal	47 (59.5)
	Macrosomia	2 (2.5)
Sex	Male	37 (46.8)
	Female	42 (53.2)
Others	IUD	4 (5)
	NICU support	7 (8.9)

Discussion

In our study, caesarean hysterectomy (CH) was an uncommon event, occurring about 6.2 in 1000 of cesarean deliveries in the year 2024. Common antenatal comorbidities in this group were gestational diabetes and hypertensive disorders, along with hypothyroidism, reflecting a high burden of metabolic and endocrine conditions in pregnant women. Nearly all cases were precipitated by severe placenta accreta spectrum (PAS) or placenta previa (effectively 9 out of 10 of our CHs were due to placenta increta, percreta, or accreta). In this setting, intensive care (ICU) support was frequently required (almost 40% of cases), and major complications included urinary tract infections, wound infections, bladder injury, coagulopathy, and one maternal death.

The incidence of CH observed here (approximately 0.6% of cesarean deliveries) is close to other studies as well. For example, research found a CH rate of about 0.4% of all deliveries (62 of 36,371) at a tertiary center in Dhaka, and a meta-analysis also reported roughly 1.1 CHs per 1000 caesarean deliveries (0.11%).[13,14] In our center, CH was nevertheless rare – reflecting advances in hemorrhage management – but not negligible given the large surgical volume. Notably, several studies show an increasing incidence of PAS-related hysterectomy in recent decades, attributed largely to rising cesarean rates.[14,15]

Morbid adhesion of placenta was the leading indication for CH in our study. Among other studies, at a Bangladeshi center, it was found that 91% of hysterectomy cases had placenta previa and prior cesareans. Another research showed that placenta accreta (with previa) accounted for 35.5% of cases, while atonic PPH comprised only 12.9%.[13,16] Similarly, in Nepal, 62.5% of hysterectomies were for PAS and only 32.5% for atony.[17] This contrasts sharply with older studies done in high-income countries, where atony was the most common cause. A meta-analysis found that globally, placental causes now account for about 38% of peripartum hysterectomies (and up to 48% in high-income countries), whereas uterine atony has declined.[14] In low-income settings like ours, uterine rupture still contributes substantially, but placenta accreta is catching up.[14,17] In our data, placenta accreta spectrum conditions accounted for 91% of CH, with only a small remainder due to rupture. This high fraction underscores that abnormal placentation is now the dominant driver of CH here. The near-ubiquitous antecedent factor is prior uterine surgery: roughly 60–90% of PAS cases have prior cesarean or curettage in most series.[16,18]

The demographic pattern in our study indicates that most women were in the 26–30-year range. This differs somewhat from other reports where PAS patients tend to be older (often >30 years.[18] This may reflect that Bangladeshi women in their late 20s are often multigravid with prior cesareans, bringing the occurrence of PAS into a younger age group. Indeed, advanced maternal age is a known risk factor for PAS, but in our setting, high parity and prior obstetric interventions may outweigh age alone.[15,18] Nearly half of our women were grand-multiparous, and their average age was around 30, similar to an Indian study (mean 30.2 years).[19]

The high rate of preterm delivery (over half of cases) is also expected in PAS. Planned early delivery is a common practice to avoid maternal hemorrhage from PAS. In our study, 55.7% delivered preterm. A similar study in 2024 showed 55% preterm births in PAS patients and noted that preterm delivery is often planned to mitigate hemorrhagic risk.[20] Our obstetric team likely elected to deliver these women early because of abnormal placentation or rupture risk, which sacrificed some neonatal maturity for maternal safety. Another factor is that many PAS cases present with antepartum bleeding or rupture requiring urgent delivery.

It is worth noting that our patients often had common pregnancy morbidities. Gestational diabetes (GDM) was recorded in about one-fifth of cases. While GDM is a rising problem in South Asia, it is not classically linked to

placenta accreta. However, diabetes in pregnancy can be associated with larger babies and an overdistended uterus, potentially contributing to hemorrhage in other ways. Likewise, gestational hypertension and hypothyroidism were present in a minority (~5–10%) of our cases. We did not find clear evidence in the literature on whether hypothyroidism or GDM drives PAS or not, so their presence likely reflects the background prevalence of these disorders in our obstetric population. Nonetheless, their identification is important as these comorbidities can complicate perioperative management.

Nearly 4 in 10 women in our study required intensive care after hysterectomy. This underscores the severity of these cases. The literature supports that PAS cases frequently need critical care. For example, a similar study reported that up to 90% of PAS patients require blood transfusion, and many need ICU monitoring. In placenta accreta, average blood loss is often several liters, so hemodynamic support is essential.[15]

Our complication profile also parallels other reports. Common complications were urinary tract infections (~24%), wound infections (~11%), bladder injuries (6%), and DIC (4%), with one maternal death. Surgical site and urologic complications are known risks of CH. In an Indian study, bladder injury occurred in about 8% of cases and DIC in 2.4%.[14] A Nigerian study mentioned bladder injuries in 15% of PAS hysterectomies.[21] Our bladder injury rate (6%) was somewhat lower than these, possibly reflecting surgical expertise or case selection. Conversely, our infection rate was higher than some reports; one study reported ~12% UTI and ~24% wound infection. The wound infection rate in our study was lower, but UTI rate was higher than them.[11] These differences could be due to perioperative antibiotic protocols or detection practices. Notably, Maternal mortality in our study was 1.3% (one death), which is lower than some other reports. Another two studies showed 4.8% and 3.2% mortality.[13,14] Our lower death rate may be due to rapid intervention and ICU care.

Interpretation of these findings centers on the role of placenta accreta spectrum in modern obstetrics. Our data reinforce that PAS is a catastrophic but increasingly common cause of peripartum hysterectomy. The biological mechanism is tied to prior uterine injury: scarring from previous cesarean or curettage disrupts the normal decidua and allows placental villi to invade the myometrium.[15,16] In our study, patients often had multiple prior LUCS, providing the site for abnormal implantation. The rising cesarean rate in Bangladesh is likely driving an increased pool of PAS, consistent with global reports.[14,15] Moreover, incomplete prenatal assessment might under-detect PAS until surgery. Without a high index of suspicion, many of these cases likely presented emergently (often preterm) when bleeding was uncontrollable. This may explain why we observed a higher proportion of rupture (9%) and the high ICU need.

These results have significant public health and clinical implications. Pregnant women with one or more prior cesareans and placenta previa should be assessed for accreta with detailed ultrasound or MRI, so that delivery can be planned electively with multidisciplinary support. The high rate of ICU admission and transfusion in our series signals the need for robust blood-bank protocols and availability of critical care in centers managing CH. Health systems in Bangladesh should ensure referral pathways so that suspected PAS cases are delivered at tertiary hospitals. Furthermore, women with comorbidities like GDM and hypertension should have tailored prenatal care, although their direct link to CH risk is unclear.

Limitations

The study is retrospective, single-center, and may be subject to selection bias. Outcomes are reported only up to discharge, excluding long-term effects. The sample size is small, and the study spans just one year. Larger, multicenter studies are needed for more accurate results, and management strategies couldn't be compared since all cases involved hysterectomy.

Conclusion

Caesarean Hysterectomy is a rare but serious intervention that is almost always done due to abnormal placentation. Our findings underscore the need for vigilant antenatal risk assessment, preparedness for massive hemorrhage, and continued efforts to mitigate PAS. Attention to these factors can help improve maternal safety in future pregnancies.

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