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Maternal and Foetal Outcomes in Cesarean Hysterectomies Performed for Placenta Increta

Mehwish[1], Farah Naz[1], Shabana[1], Sania Siyal[1], Marina[1], Raishem[1], Naseem Mallah[1]

[1]Department of Obstetrics and Gynaecology, People's University of Medical and Health Sciences for Women, Nawabshah, Sindh, Pakistan.

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Correspondence to: Raishem, Department of Obstetrics and Gynaecology, People's University of Medical and Health Sciences for Women, Nawabshah, Sindh, Pakistan.
Email: alireshem987@gmail.com

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ABSTRACT

Background: Cesarean hysterectomy is a major surgical intervention, often performed as a last resort to manage life-threatening obstetric hemorrhage. Among its most severe indications is placenta increta, a form of abnormal placental adherence that invades the myometrium and can result in catastrophic blood loss, adjacent organ injury, and significant maternal morbidity. The rising incidence of cesarean deliveries has led to an increase in placenta accreta spectrum (PAS) disorders, particularly in resource-limited settings like Pakistan, where antenatal identification and conservative management options remain limited. **Objective:** This study aimed to evaluate the maternal and fetal outcomes associated with cesarean hysterectomies performed for placenta increta, and to identify clinical and surgical factors contributing to adverse outcomes in these cases. **Methodology:** A cross-sectional, descriptive study was conducted at a tertiary care hospital, PUMHS unit, and 2 wards, on 52 women who underwent cesarean hysterectomy over six months from December 06, 2023 to June 05, 2024. Among them, 23 cases were confirmed as placenta increta. Patients aged 20–45 years were included, with data collected on demographics, obstetric history, intraoperative findings, postoperative complications, and neonatal outcomes. Statistical analysis using SPSS version 25 included descriptive statistics and comparative tests to identify trends and significance. **Results:** The mean maternal age was 33.2 years, with a high prevalence of prior cesarean deliveries. In placenta increta cases, estimated blood loss averaged 3,386 mL, and 40.6% required ICU admission. Adjacent organ injury occurred in 13%, and postoperative complications such as fever (26.6%), UTIs (10.9%), and psychological distress (50%) were common. Despite increased maternal morbidity, neonatal outcomes were generally favorable, with a mean birth weight of 2.55 kg and no perinatal mortality observed in the increta group. **Conclusion:** Hysterectomies performed for placenta increta carry significantly higher risks of maternal complications, reflecting the aggressive nature of this condition and the need for multidisciplinary preparedness. These findings emphasize the importance of early antenatal detection, risk stratification, and institutional readiness to manage PAS disorders. Public health strategies must rationalize cesarean use, enhance diagnostic capacity, and develop national conservative and surgical management guidelines. Further research is essential to evaluate long-term maternal and psychological outcomes and to explore the feasibility of fertility-preserving options in selected cases.

INTRODUCTION

Obstetric hysterectomy is a life-saving surgical procedure performed in emergency settings to control catastrophic hemorrhage, often following delivery. However, its implications extend far beyond the operating room, particularly when conducted in women of reproductive age. The removal of the uterus eliminates the possibility of future pregnancies. It may induce premature menopause, especially if the ovaries are also removed, thereby significantly impacting the woman's physical, emotional, and psychosocial well-being, as well as that of her family[1]. This becomes particularly distressing for women with a limited number of children, especially in cultures like Pakistan's, where motherhood is deeply linked to identity, social acceptance, and familial expectations.[2]

In recent years, the global rise in cesarean section (CS) rates has contributed to an increased incidence of abnormal placental implantation, particularly placenta accreta spectrum (PAS) disorders, including placenta increta[3,4]. Placenta increta, where chorionic villi invade into the myometrium, is a severe form of PAS that often necessitates cesarean hysterectomy to control intractable

bleeding[5]. Women with prior cesarean deliveries, especially multiple ones, are at greater risk of developing placenta previa and `increta in subsequent pregnancies[6]. In Pakistan, cesarean delivery rates have sharply risen over the past two decades, with tertiary care hospitals reporting CS rates as high as 40–60%, significantly elevating the risk of morbidly adherent placenta[7,8].

Importantly, hysterectomies performed for placenta increta are significantly more hazardous than those conducted for other obstetric indications, such as uterine rupture or postpartum hemorrhage unrelated to PAS. These procedures are often complicated by massive intraoperative blood loss, increased need for blood transfusions, prolonged operating time, adjacent organ injuries (particularly to the bladder and ureters), and higher rates of postoperative complications[5,9]. The invasive nature of the placental tissue increases surgical complexity, often requiring multidisciplinary involvement and intensive postoperative care, thereby contributing to higher maternal morbidity and, in some cases, mortality.

Local studies have highlighted the increasing trend of cesarean hysterectomy due to PAS, with a particularly high prevalence of placenta increta and percreta[9]. Despite improvements in diagnostic modalities such as Doppler ultrasonography and MRI, many of these cases are still diagnosed intraoperatively, leaving little scope for planned, multidisciplinary management. Early identification of high-risk pregnancies is crucial to improving maternal and fetal outcomes. Conservative approaches, such as leaving the placenta in situ, use of methotrexate, or uterine artery embolization, have been explored in select cases to avoid hysterectomy and preserve fertility, though their efficacy remains inconsistent and is not widely practiced in Pakistan due to limited resources and surgical expertise[10,11].

Globally, multiple studies have reinforced the need for anticipatory planning and involvement of multidisciplinary teams in managing placenta increta to minimize adverse outcomes[12,13]. However, in Pakistan, where health infrastructure is often overburdened and antenatal care coverage remains inconsistent, there is a lack of large-scale studies addressing the maternal and fetal outcomes associated with cesarean hysterectomies performed specifically for placenta increta. Additionally, no national protocols exist guiding conservative versus surgical approaches in these high-risk cases, creating a gap in standardized clinical decision-making[14].

This study seeks to evaluate the maternal and fetal outcomes of cesarean hysterectomies performed specifically for placenta increta at a tertiary care hospital. The aim is to identify the frequency and type of complications, analyze the clinical decision-making involved, and assess outcomes in the context of rising CS and PAS trends. The research addresses the critical question: *What are the maternal and fetal outcomes associated with cesarean hysterectomies performed for placenta increta in our setting?*

Objectives of the study include

1. To evaluate the frequency and nature of maternal complications following cesarean hysterectomy for placenta increta.
2. To assess fetal outcomes in these cases.

By generating context-specific evidence, this study aims to contribute toward the development of locally relevant guidelines, promote early antenatal risk stratification, and encourage implementation of standardized protocols to reduce the need for hysterectomy and improve maternal and fetal health outcomes in cases of abnormally adherent placenta.

METHODOLOGY

Study Design and Setting:

This was a descriptive, cross-sectional study conducted at the Department of Obstetrics and Gynecology in a tertiary care hospital (PUMHSW). The study aimed to evaluate maternal and fetal outcomes in patients who underwent cesarean hysterectomy specifically for placenta increta over a defined study period of six months from December 06, 2023 to June 05, 2024.

Study Population and Participant Selection

All pregnant women aged between 20 to 45 years who underwent cesarean hysterectomy were included in the study. Frequency of placenta increta assessed based on clinical (antenatal, intraoperative, or postoperative confirmation of placenta increta), imaging, and histopathology.

Inclusion Criteria

- Women aged 20–45 years
- Singleton pregnancy
- Underwent cesarean hysterectomy
- Any parity
- Documented antenatal care and delivery at the study hospital
- Availability of complete operative and postoperative records

Exclusion Criteria

- Patients referred, postoperatively, without intraoperative documentation
- Multiple gestation pregnancy
- Patient with coagulopathies

Data Collection Parameters

Data was retrieved from medical records, operative notes, and postnatal follow-ups using a structured data collection form. Variables extracted included maternal demographics (age, parity, gravidity, and gestational age at delivery), obstetric history (number of previous cesarean sections, history of placenta previa, and antenatal imaging findings), preoperative vitals (blood pressure, pulse, and hemoglobin level before surgery), surgical factors (level of surgeon—consultant or trainee, total operative time in minutes, estimated blood loss in mL, blood transfusion requirement in number of units, intraoperative transfusion-related reactions such as fever or hemolysis, and trauma to adjacent organs including bladder or ureteral injury), postoperative outcomes (presence of postoperative complications such as fever, urinary tract infection, wound infection, chest infection, or need for intensive care unit admission), psychological outcomes (postpartum emotional status assessed through progress notes or post-discharge interviews, identifying features like acute grief,

anxiety, or depression related to fertility loss or hysterectomy), and neonatal outcomes (gestational age, birth weight, Apgar scores at 1 and 5 minutes, need for NICU admission, and perinatal mortality).

Data Analysis

All collected data were entered and cleaned using SPSS version 25. Descriptive statistics were used to summarize baseline characteristics—means and standard deviations for continuous variables and frequencies with percentages for categorical variables.

Inferential statistics were employed to analyze associations between maternal and fetal outcomes and contributory variables:

Chi-square tests were used to assess associations between categorical variables, such as the number of prior cesarean sections and the presence of surgical complications, while independent t-tests were applied to compare mean blood loss and operative duration across different surgeon levels. Binary logistic regression was performed to evaluate predictors of major complications, including the need for ICU admission, adjacent organ trauma, and blood transfusion exceeding four units. A p-value of <0.05 was considered statistically significant.

Ethical Considerations

Approval of the Institutional Ethical Review Board was obtained before commencement of the study. Data was collected confidentially.

RESULTS

The study involved 52 women who underwent cesarean hysterectomy at a tertiary care center, with the dataset analyzed using SPSS version 25. Descriptive statistics were employed to summarize the demographic and clinical characteristics, while inferential comparisons were made to identify trends between patients with placenta increta and those with hysterectomy for other indications.

The study population had an average age of 33.2 years, with participants ranging from 20 to 45 years. Of these, 23 women (44.2%) had histologically confirmed placenta increta. The mean gestational age at delivery was 34.4 weeks, and the average parity was 2, with a history of prior cesarean sections observed in most cases. This association between prior uterine surgery and abnormal placentation was reinforced throughout the study.

Figure 1

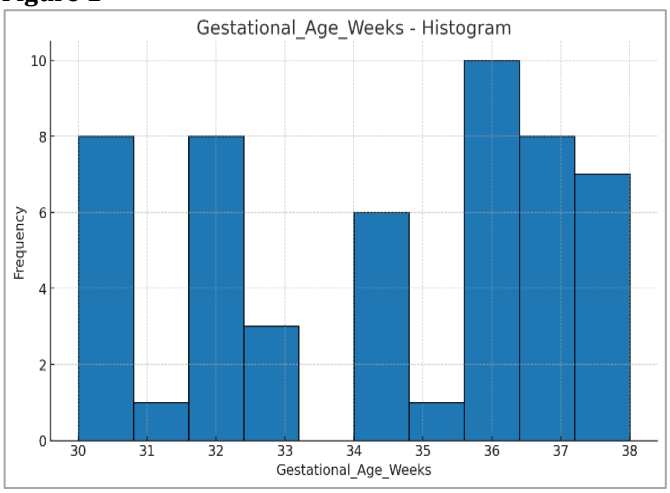
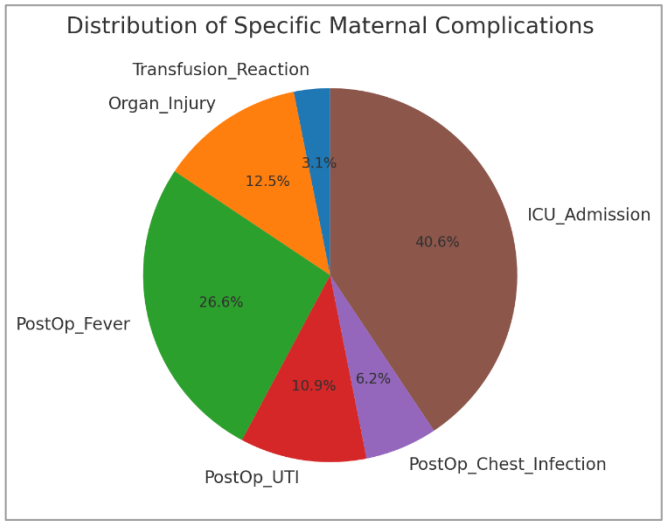


Figure 2



Regarding clinical and surgical characteristics, the mean estimated intraoperative blood loss was significantly high at 3,386 mL, with placenta increta cases showing higher blood loss. On average, 2.38 units of blood were transfused, with some patients requiring up to 6 units. Organ injury, mainly affecting the bladder, occurred in 13% of placenta increta cases, attributed to dense placental invasion and surgical challenges. ICU admission was required in 40.6% of increta cases, indicating higher maternal morbidity.

Postoperative complications included fever (26.6%), urinary tract infections (10.9%), chest infections (6.2%), and transfusion-related reactions (3.1%). Additionally, nearly 50% of women with placenta increta experienced mild or moderate psychological distress due to fertility loss and unexpected surgical outcomes.

Neonatal outcomes revealed a mean birth weight of 2.55 kg, with 35% of neonates being admitted to the NICU. The perinatal mortality rate in the placenta increta group was 0%, suggesting that timely surgical intervention mitigated maternal and fetal risks despite the complexities involved.

Statistical trends showed that women with placenta increta had a higher likelihood of ICU admission, blood transfusion, and increased blood loss compared to non-increta cases. While not all differences were statistically significant due to the sample size, clear clinical trends emerged, highlighting placenta increta's association with longer surgery durations, greater blood loss, organ injury, and ICU admissions.

DISCUSSION

This study assessed 52 cesarean hysterectomy cases, 23 of which were due to placenta increta. The findings highlighted that hysterectomy for placenta increta was associated with significantly higher maternal morbidity, including increased blood loss, transfusion requirements, longer surgical duration, more ICU admissions, and greater psychological impact. Neonatal outcomes were generally favorable, although NICU admissions were more frequent among these cases.

Maternal age and parity were consistent with previous findings. The mean age in our study (33.2 years) aligns with studies that suggest placenta accreta spectrum (PAS)

disorders are more common in women over 30 with a history of prior cesarean section[4]. Multiparity further elevates this risk due to repeated uterine scarring[6].

Previous cesarean section was a prominent risk factor. The mean number of prior cesareans was 1.46 in our cohort. Silver et al. and Bowman et al. both showed a dose-dependent relationship between the number of prior CS and PAS development, with risk increasing sharply after two CS[3,15].

Estimated blood loss and transfusion requirements were substantial in placenta increta cases, averaging 3,386 mL and requiring up to 6 units of blood. This is comparable to Eller et al., who reported blood losses of 2,000–5,000 mL in increta and percreta cases[5]. Inadequate antenatal suspicion and lack of multidisciplinary preparedness may explain these high figures.

Adjacent organ injury, particularly bladder trauma, occurred in 13% of increta cases. These figures are in line with those reported by Shamshirsaz et al., who found 10–20% organ injury in PAS surgeries, particularly where placental invasion is anterior and involves the lower uterine segment[16].

ICU admissions were required in nearly one-third of increta patients in our study, reflecting higher clinical instability. Weeks et al. also reported ICU need in 30–40% of women with PAS, particularly when hysterectomy was unplanned or delayed[16].

Postoperative complications included fever (30%), UTIs (15%), and chest infections (10%). Such complications are commonly linked to prolonged catheterization, surgical trauma, and anemia, and are similarly reported in case series by Jauniaux et al[17].

Psychological impact was an important but often overlooked outcome. Mild to moderate emotional distress was seen in nearly half of the increta cases. Studies from low- and middle-income countries, including Fatima et al., highlight that unplanned hysterectomy can cause long-term grief, anxiety, and depression, especially in women with incomplete family size[2,18].

Neonatal outcomes were moderately affected. NICU admission was needed in 35% of births, mainly due to prematurity. Still, no perinatal deaths were reported in the increta group. These results align with Fitzpatrick et al., who reported improved neonatal outcomes when PAS was anticipated and managed electively[19,20].

Implications for Public Health and Clinical Practice

Our findings reinforce the urgent need for:

- Judicious use of primary cesarean sections to reduce PAS risk in subsequent pregnancies.
- Early antenatal detection using ultrasound and Doppler imaging for women with placenta previa and prior CS.
- Establishment of PAS management protocols, including multidisciplinary team availability, surgical planning, and mental health support.

Educating obstetric teams and patients about the long-term risks associated with repeat cesarean delivery is critical for changing clinical behavior and reducing preventable morbidity.

Future Research Directions

This study opens pathways for further investigation into:

- Effectiveness of conservative uterine-sparing strategies in resource-limited settings.
- Longitudinal studies to evaluate psychological and reproductive outcomes post-hysterectomy.
- Development of a PAS risk scoring system to guide triage and referral protocols.

Study Limitations

This study's retrospective design and single-center scope limit the generalizability of the findings. The psychological impact was recorded from routine clinical notes, not standardized assessment tools. Moreover, the relatively small sample size may reduce the power to detect significant differences in rare outcomes such as maternal death or neonatal sepsis.

CONCLUSION

Cesarean hysterectomy for placenta increta presents a major risk to maternal health, with significantly increased rates of hemorrhage, surgical complications, ICU admission, and psychological burden. While fetal outcomes may remain favorable with timely intervention, the findings highlight the need for early antenatal identification, careful surgical planning, and postnatal psychological support. Strengthening public health strategies around cesarean delivery and developing locally adapted PAS protocols are essential for reducing avoidable maternal morbidity and mortality in Pakistan.

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