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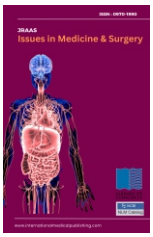

Research Article

Section: Obstetrics & Gynaecology

A Clinical Study of Placenta Previa & its Effect on Maternal & Fetal Outcome

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HIGHLIGHTS

- Cesarean section risk factor
- Multiparity associated with previa
- Maternal morbidity significantly increased
- Neonatal complications commonly observed
- Early diagnosis improves outcome

Key Words:
Placenta previa
Antepartum hemorrhage
Cesarean section
Maternal outcome
Fetal outcome

ABSTRACT

Introduction: Placenta previa is a major obstetric complication in which the placenta is implanted in the lower uterine segment, partially or completely covering the internal cervical os, leading to antepartum hemorrhage, operative delivery, and increased maternal and neonatal morbidity. Its incidence has gained importance with rising cesarean section rates and improved ultrasonographic diagnosis. **Aim & Objective:** To study the prevalence of placenta previa, evaluate maternal and fetal outcomes, and identify associated risk factors. **Materials & Methods:** This hospital-based observational study was conducted in the Department of Obstetrics and Gynaecology, MCH, KIMS Koppal, from June 2024 to May 2025. Pregnant women diagnosed with placenta previa after 28 weeks of gestation, either clinically or by ultrasonography, were included. Detailed history, clinical examination, investigations, intraoperative findings, maternal complications, and neonatal outcomes were recorded and analyzed. **Results:** A total of 38 cases were studied. Most women were aged 31 to 35 years (47.0%) and multiparous, with para 2 to 4 constituting 65.7%. Previous cesarean section was present in 75.0% cases. Cesarean delivery was performed in 78.94%. Maternal morbidity included blood transfusion (47.3%), uterine artery ligation (26.3%), postpartum hemorrhage (21.05%), ICU admission (7.89%), and cesarean hysterectomy (5.26%), with no maternal mortality. Neonatal outcomes showed birth weight ≥2.5 kg in 70.0%, APGAR score ≥6 in 72.0%, NICU admission in 28.9%, and perinatal death in 10.05%. Advanced maternal age and multiparity were prominent associated factors. **Conclusion:** Placenta previa remains a significant cause of maternal and perinatal morbidity. Early diagnosis, timely referral, blood bank preparedness, and multidisciplinary management are essential for improving fetomaternal outcome and reducing preventable complications in high-risk pregnancies managed at tertiary care centres overall.

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INTRODUCTION

Placenta previa is a major cause of obstetric morbidity and adverse perinatal outcome, characterized by placental implantation in the lower uterine segment partially or completely covering the internal cervical os, thereby obstructing vaginal delivery and predisposing to recurrent antepartum hemorrhage [1]. It remains a clinically significant placental disorder due to risks of severe bleeding, preterm birth, operative delivery, postpartum hemorrhage, transfusion, and hysterectomy in complicated cases. Closely associated with Placenta Accreta Spectrum, its global prevalence ranges from 0.3% to 2%, varying with cesarean rates, maternal age, and referral patterns [2].

Placenta previa has gained increasing relevance due to changing epidemiology driven by rising institutional deliveries, improved ultrasonographic detection, and notably increasing cesarean section rates. Previous cesarean delivery remains the strongest risk factor, with markedly higher risk when associated with uterine scarring and potential Placenta Accreta Spectrum [3]. Additional risk factors include multiparity, advanced maternal age, prior uterine surgery or evacuation, myomectomy, assisted reproductive techniques, smoking, and previous placenta previa, reflecting its close association with evolving reproductive and surgical trends [4]. From a pathophysiological perspective, the abnormal implantation of the placenta in the lower uterine segment becomes clinically hazardous as pregnancy advances and the lower segment stretches and thins. This process disrupts placental attachment and exposes maternal vessels, leading to the classic presentation of painless, recurrent bleeding in the second half of pregnancy.

In some women, the diagnosis is made incidentally on routine ultrasonography before symptoms appear, whereas in others the first manifestation may be significant vaginal bleeding requiring urgent hospitalization [5]. The importance of antenatal recognition lies in the fact that timely diagnosis permits surveillance, counseling, blood bank preparation, planning of delivery, and referral to an appropriately equipped centre. Both RCOG guidance and contemporary reviews emphasize that prenatal diagnosis substantially improves preparedness and clinical outcome by allowing delivery to occur in a controlled rather than emergency setting [6].

Ultrasonography has revolutionized the evaluation of placenta previa and is now central to diagnosis, classification, and follow-up. Transabdominal ultrasonography is often the first screening tool, but transvaginal ultrasonography is considered highly accurate and safe when the placental location remains uncertain [7]. Early pregnancy low-lying placentation may resolve with advancing gestation because of placental trophotropism and differential growth of the uterus, so a persistent placenta previa diagnosed later in pregnancy is of greater clinical significance than an early low-lying placenta. This dynamic nature explains why repeat imaging is essential before definitive labeling and delivery planning. Accurate localization is also critical because anterior placenta previa over a previous cesarean scar raises strong suspicion for placenta accreta spectrum, thereby escalating maternal risk and surgical complexity [2].

Placenta previa carries significant maternal morbidity, with antepartum hemorrhage as the principal complication, ranging from mild spotting to life-threatening bleeding. Recurrent

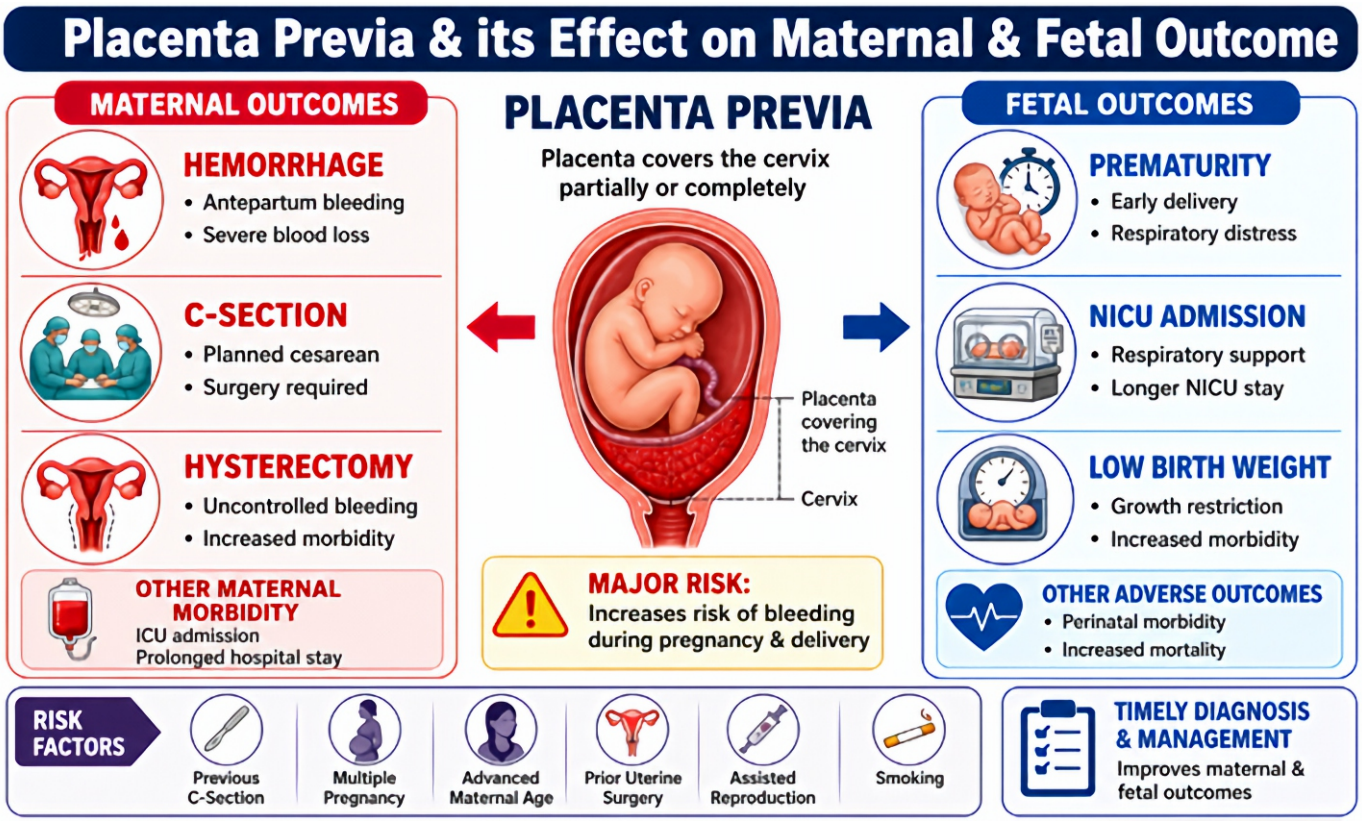

Figure 1. Placenta previa and its effects on maternal and fetal outcomes, associated risk factors, and importance of timely diagnosis and management.

episodes often require hospitalization, corticosteroids, and planned early delivery [8]. It is associated with malpresentation, difficult cesarean section, increased intraoperative blood loss, postpartum hemorrhage, transfusion requirement, prolonged hospital stay, and possible ICU care. Coexisting placenta accreta spectrum markedly increases risks, including peripartum hysterectomy and adjacent organ injury, necessitating multidisciplinary management in well-equipped centers [9].

The fetal and neonatal consequences are equally important and are largely mediated through prematurity, recurrent maternal bleeding, and the need for planned or emergency preterm cesarean section [10]. Placenta previa has been associated with preterm birth, low birth weight, neonatal respiratory morbidity, higher neonatal unit admission, and increased perinatal mortality in severe or poorly resourced settings. Contemporary evidence indicates that neonatal outcome is strongly influenced by gestational age at delivery; therefore, much of the fetal risk in placenta prevails the balance clinicians must maintain between prolonging pregnancy safely and preventing catastrophic maternal hemorrhage. In addition, abnormal placentation may coexist with fetal growth problems in selected cases, although prematurity remains the dominant determinant of neonatal morbidity [11].

Clinical management of placenta previa, therefore requires a careful, individualized, risk-based approach. Women diagnosed with major placenta previa need counseling regarding warning symptoms, avoidance of unsupervised vaginal examination, the possibility of recurrent bleeding, and the likelihood of cesarean delivery [12]. Timing of delivery depends on the severity of previa, gestational age, maternal stability, fetal condition, and presence or absence of bleeding episodes. Planned cesarean section is generally the mode of delivery for persistent major placenta previa because the placenta overlies or encroaches upon the cervical os, making vaginal delivery unsafe. At the same time, contemporary care emphasizes anticipation of hemorrhage, preoperative optimization, neonatal preparedness, and multidisciplinary decision-making, particularly when placenta accreta spectrum is suspected [13].

Despite advances in antenatal imaging, transfusion services, anesthesia, and neonatal care, placenta previa remains a major contributor to maternal and fetal morbidity, particularly in referral centres managing high-risk and scarred pregnancies [14]. It reflects both immediate hemorrhagic risk and evolving obstetric trends such as rising cesarean rates. A clinical study is therefore essential to assess local disease burden, associated maternal and neonatal complications, and effectiveness of current management strategies, thereby improving anticipatory care, referral planning, operative preparedness, and overall fetomaternal outcomes [2]. Placenta previa with maternal and fetal outcomes, risk factors, and management **(Figure 1)**.

This study aims to evaluate the prevalence of placenta previa, along with associated maternal & neonatal outcomes & related risk factors. The primary objectives are to assess maternal outcomes and fetal outcomes in cases of placenta previa. The secondary objective is to identify & analyze the various risk factors contributing to the occurrence of placenta previa in the study population.

MATERIALS & METHODS

A hospital-based observational study was conducted in the Department of Obstetrics & Gynaecology, MCH, KIMS Koppal, over a period of one year (June 2024 to May 2025). All pregnant women diagnosed with placenta previa after 28 weeks of gestation, either clinically or by ultrasonography, were included. Detailed history, clinical examination, and relevant investigations, including Doppler studies, were performed. Data regarding maternal characteristics, obstetric history, clinical presentation, and mode of delivery were recorded. Intraoperative findings and maternal outcomes such as hemorrhage, transfusion, and complications were noted. Neonatal outcomes, including birth weight, APGAR score, and NICU admission, were also assessed.

RESULTS

The age distribution in our study demonstrates a clear predominance of placenta previa in the advanced maternal age group, with the highest proportion seen in 31–35 years (47.0%), followed by 36–40 years (26.3%), while younger age groups contributed comparatively fewer cases (26–30 years: 15.7%; ≤25 years: 10.5%). This trend indicates a progressive increase in incidence with advancing maternal age, suggesting age as a significant risk factor. The clustering of cases in women above 30 years reflects cumulative obstetric exposure and possible endometrial changes predisposing to abnormal placental implantation. Overall, the findings highlight advanced maternal age as an important epidemiological determinant influencing the occurrence of placenta previa **(Table 1)**. The parity distribution in our study shows a marked predominance of placenta previa among multiparous women, with the majority belonging to para 2–4 (65.7%), followed by grand multipara (≥5) accounting for 28.9%, while primiparous women (para 0–1) constituted only 5.2%. This pattern demonstrates a strong positive association between increasing parity and the occurrence of placenta previa. The higher incidence in multiparous and grand multiparous women may be attributed to repeated endometrial and uterine structural changes from prior pregnancies. Overall, the findings reinforce multiparity as a significant obstetric risk factor for placenta previa **(Table 2)**. The gestational age distribution in our study shows that the majority of placenta previa cases presented between 33–37 weeks (52.6%), followed by term pregnancies >37 weeks (26.3%), while a smaller proportion occurred at 28–32 weeks (21%). This indicates that placenta previa commonly manifests in the late preterm period, contributing significantly to preterm obstetric burden. The higher frequency before term reflects the tendency for antepartum hemorrhage leading to earlier clinical presentation and intervention. Overall, these findings highlight the strong association of placenta previa with late preterm delivery and its impact on timing of obstetric management **(Table 3)**. The past obstetric history in our study reveals a strong

association between placenta previa and prior cesarean delivery, with the majority of cases having a history of 1–2 C-sections (75%), while only 22.2% had previous normal vaginal delivery and a minimal proportion had ≥3 cesarean sections (2.6%). This indicates that previous uterine surgical intervention is a major predisposing factor for abnormal placental implantation. The high prevalence among women with prior cesarean sections supports the role of uterine scar formation and endometrial disruption in the pathogenesis of placenta previa. Overall, the findings reinforce previous cesarean delivery as a key modifiable risk factor in its occurrence **(Table 4)**. The placental position distribution in our study shows a predominance of anterior placenta (59.3%) compared to posterior placenta (40.6%) among cases of placenta previa. This suggests that anterior placentation is more frequently associated with abnormal implantation in the lower uterine segment. The higher occurrence of anterior placenta may be related to prior uterine scarring, particularly from previous cesarean sections, which predisposes to implantation over the scarred anterior wall. Overall, these findings indicate that anterior placental location may have a stronger association with placenta previa and its related obstetric risks **(Table 5)**. The mode of delivery distribution in our study demonstrates a clear predominance of cesarean section (78.94 %) over normal vaginal delivery (21.05%) in cases of placenta previa. This reflects the clinical necessity of operative delivery due to the risk of severe antepartum and intrapartum hemorrhage associated with placental location over or near the cervical os. The relatively low proportion of vaginal deliveries indicates that only carefully selected cases with minor degrees of previa or favorable conditions were managed conservatively. Overall, the findings highlight cesarean section as the primary and safest mode of delivery in placenta previa to optimize maternal and fetal outcomes **(Table 6)**. The maternal outcome profile in our study demonstrates a significant burden of hemorrhagic morbidity, with blood transfusion being the most common intervention (47.3%), followed by uterine artery ligation (26.3 %) and postpartum hemorrhage (21.05%), indicating substantial intraoperative and postoperative bleeding risk. ICU admission was required in 7.89% of cases, reflecting moderate severity in a subset of patients, while cesarean hysterectomy was performed in 5.26%, highlighting life saving surgical intervention in complicated cases. Notably, no cases of bladder injury or maternal mortality were observed, suggesting effective surgical management and multidisciplinary care. Overall, the findings indicate high maternal morbidity but favorable survival outcomes in placenta previa **(Table 7)**. The fetal outcome profile in our study shows that the majority of neonates had adequate birth weight (≥2.5 kg: 70%), while 26% were low birth weight, indicating a moderate impact of placenta previa on fetal growth. APGAR scores were reassuring in most cases (≥6: 72%), although 24% had lower scores, reflecting initial neonatal compromise. NICU admission was required in 28.9% of neonates, highlighting the need for enhanced neonatal care, while perinatal mortality was observed in 10.05% of cases. Overall, despite generally favorable birth weight and APGAR outcomes, placenta previa is associated with significant neonatal morbidity and some mortality **(Table 8)**.

Table 1: Distribution of patients according to age

Age (in years)	Frequency	Percentage (%)
31–35	18	47.0
36–40	10	26.3
26–30	6	15.7
26–25	4	10.5
Total	**38**	**100**

Table 2: Distribution of patients according to parity

Parity	Frequency	Percentage (%)
Para 2–4	25	65.7
Para ≥5	11	28.9
Para 0–1	2	5.2
Total	**38**	**100**

Table 3: Distribution of patients according to gestational age

Gestational Age	Frequency	Percentage (%)
33–37 weeks	20	52.6
28–32 weeks	8	21.0
>37 weeks	10	26.3
Total	**38**	**100**

Table 4: Distribution of patients according to past obstetric history

Past Obstetric History	Frequency	Percentage (%)
NVD	8	22.2
1–2 C-sections	27	75.0
≥3 C-sections	1	2.6
Total	**36**	**100**

Table 5: Distribution of patients according to placental position

Placental Position	Frequency	Percentage (%)
Anterior	23	59.3
Posterior	15	40.6
Total	**38**	**100**

Table 6: Distribution of patients according to mode of delivery

Mode of Delivery	Frequency	Percentage (%)
Normal vaginal delivery	8	21.05
Caesarean section	30	78.94
Total	**38**	**100**

Table 7: Distribution of patients according to maternal outcomes

Maternal Outcomes	Frequency	Percentage (%)
PPH	8	21.05
Caesarean hysterectomy	2	5.26
Bladder injury	0	0.0
ICU admission	3	7.89
Mortality	0	0.0
Blood transfusion	18	47.3
Uterine artery ligation	10	26.3

Table 8: Fetal outcome

Fetal Outcome	Frequency	Percentage (%)
Birth weight		
<2.5 kg	12	26.0
≥2.5 kg	26	70.0
APGAR score		
<6	10	24.0
≥6	28	72.0
NICU admissions	11	28.9
Perinatal deaths	4	10.05

DISCUSSION

Placenta previa are significant obstetric conditions characterized by placental implantation in the lower uterine segment, leading to antepartum hemorrhage and adverse maternal and fetal outcomes. Its prevalence ranges from 0.3% to 2% and is increasing due to rising cesarean rates and improved diagnosis. Major risk factors include prior cesarean delivery, multiparity, and advanced maternal age. Antenatal diagnosis using ultrasonography enables better planning and reduces complications. Maternal risks include hemorrhage, transfusion, and hysterectomy, while fetal risks are mainly due to prematurity and low birth weight. Effective management requires timely diagnosis, multidisciplinary care, and planned cesarean delivery to optimize outcomes [15].

Our findings are in close agreement with recent literature showing that placenta previa is strongly associated with both advanced maternal age and higher parity. In our study, most cases occurred after 30 years of age, particularly in 31 to 35 years (47.0%) and 36 to 40 years (26.3%), with a parallel predominance among para 2 to 4 women (65.7%) and grand multipara (28.9%). This pattern is supported by Adere et al. (2020), who identified advanced maternal age ≥35 years as a major risk factor for placenta previa with AOR 6.3 (95% CI 3.20 to 12.51) and also found multiparity to be significant with AOR 2.2 (95% CI 1.46 to 3.46). A similar age-related association was reported by Monterde-Fernández et al. (2025), where advanced maternal age remained independently associated with placenta previa with OR 3.0 (95% CI 1.3 to 7.1). Together, these studies validate our observation that increasing age and repeated childbearing are important epidemiological determinants of placenta previa [16,17].

Our findings are consistent with recent evidence showing that placenta previa is closely linked to late preterm delivery and previous cesarean section. In our study, the largest proportion presented at 33 to 37 weeks (52.6%), followed by more than 37 weeks (26.3%), while 21.0% occurred at 28 to 32 weeks, indicating that placenta previa commonly manifests before term and contributes substantially to preterm obstetric intervention. This is supported by Otake et al. (2024), who studied 78 placenta previa patients and found antenatal bleeding in 34.6%, emergency cesarean section in 32.1%, and a significantly shorter gestational age at delivery in affected cases, with median delivery at 36 weeks 3 days versus 37 weeks 1 day (p=0.048). Our finding of strong association with prior cesarean delivery is similarly corroborated by Monterde-Fernández et al. (2025), who reported previous cesarean section as a major independent risk factor for placenta previa with OR 10.7 (95% CI 1.7 to 68.5) [17,18].

Our findings are consistent with recent literature showing that anterior placenta previa is associated with greater obstetric risk and that cesarean section is the predominant mode of delivery in placenta previa. In our study, anterior placentation accounted for 59.3% of cases versus 40.6% posterior, suggesting a stronger association of anterior lower segment implantation likely related related to prior uterine scarring. This is supported by Lee et al. (2024), who, in 781 women with placenta previa, reported that the anterior group (n=209) had significantly lower gestational age at delivery, higher rates of previous cesarean section, admission for bleeding, emergency cesarean section, transfusion, and placenta accreta spectrum, with transfusion OR 2.23 (95% CI 1.50 to 3.30) and placenta accreta spectrum OR 2.16 (95% CI 1.21 to 3.97). Likewise, Oğlak et al. (2022) studied 208 confirmed placenta previa pregnancies, and all were delivered by cesarean section, with 46.6% emergency and 53.4% planned cesareans, reinforcing cesarean delivery as the safest standard management in placenta previa [19,20].

Our findings are consistent with recent evidence that placenta previa carries substantial maternal hemorrhagic morbidity and important neonatal morbidity, although survival is usually favorable with timely tertiary care. In our study, blood transfusion (47.3%), uterine artery ligation (26.3%), postpartum hemorrhage (21.05%), ICU admission (7.89%), and cesarean hysterectomy (5.26%) together indicate considerable bleeding-related maternal risk, while the absence of maternal mortality suggests effective multidisciplinary management. A similar pattern was reported by Ali et al. (2025) in 150 previa pregnancies, where maternal morbidity included PPH ≥1000 mL in 88.7%, transfusion in 90.0%, hysterectomy in 14.7%, and ICU admission in 18.7%; neonatal morbidity was also high, with preterm birth in 72.7%, NICU admission in 70.7%, and 5-minute Apgar <7 in 11.3%. Likewise, Rao et al. (2021) found poorer outcomes in placenta previa covering a uterine scar, including postpartum hemorrhage 48.7%, transfusion 34.6%, hysterectomy 2.6%, fetal distress 35.7%, and 1-minute low Apgar 15.2%, thereby supporting our observation that placenta previa is associated with major maternal bleeding and meaningful neonatal compromise [21,22].

CONCLUSION

Placenta previa remains a significant contributor to maternal and perinatal morbidity, primarily due to risks of antepartum hemorrhage, operative delivery, and preterm birth. Early diagnosis through ultrasonography, timely referral to tertiary care centers, and multidisciplinary management are crucial in improving outcomes. Our study demonstrates that with appropriate antenatal surveillance, availability of blood transfusion facilities, and neonatal intensive care support, favorable maternal and fetal outcomes can be achieved. Preventive strategies, including reducing unnecessary cesarean sections and proper counseling, are essential to decrease the rising incidence and associated complications of placenta previa.

LIMITATIONS & FUTURE PERSPECTIVES

The study's limitations include a single-centre setting, a relatively small sample size, and a short study duration, which may limit the broader applicability of the results. Future studies should incorporate multicentre designs with larger populations to enhance validity, assess long-term outcomes, and investigate advanced diagnostic & management approaches. Such efforts will improve

overall patient care and help minimize complications.

CLINICAL SIGNIFICANCE

The clinical significance of this study lies in its potential to bridge the gap between research findings and practical healthcare applications. It emphasizes the importance of translating scientific observations into meaningful improvements in patient care, diagnosis, and treatment outcomes. By highlighting real-world relevance, the study contributes to evidence based medical practice and supports informed clinical decision making. Ultimately, the findings aim to enhance patient quality of life, optimize therapeutic strategies, and promote better disease management in clinical settings.

ABBREVIATIONS

AOR: Adjusted Odds Ratio
OR: Odds Ratio
CI: Confidence Interval
ICU: Intensive Care Unit
PPH: Postpartum Hemorrhage
NICU: Neonatal Intensive Care Unit
PAS: Placenta Accreta Spectrum
LSCS: Lower Segment Cesarean Section

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AUTHOR CONTRIBUTIONS

All authors significantly contributed to the study conception and design, data acquisition, or data analysis and interpretation. They participated in drafting the manuscript or critically revising it for important intellectual content, consented to its submission to the current journal, provided final approval for the version to be published, and accepted responsibility for all aspects of the work. Additionally, all authors meet the authorship criteria outlined by the International Committee of Medical Journal Editors (ICMJE) guidelines.

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CONFLICT OF INTEREST

Authors declared that there is no conflict of interest.

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ETHICAL APPROVAL & CONSENT TO PARTICIPATE

All necessary consent & approval was obtained by authors.

CONSENT FOR PUBLICATION

All necessary consent for publication was obtained by authors.

DATA AVAILABILITY

All data generated and analyzed are included within this research article. The datasets utilized and/or analyzed in this study can be obtained from the corresponding author upon a re-asonable request.

USE OF ARTIFICIAL INTELLIGENCE (AI) & LARGE LANGUAGE MODEL (LLM)

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This article serves as an important educational tool for the scientific community, offering insights that may inspire future research diretions. However, they should not be relied upon independently when making treatment decisions or developing public health policies.

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