

Comparative Study of Placenta Accreta Spectrum Disorders with and Without Placenta Previa: Incidence, Diagnostic Trends, Risk Factors, and Maternal–Neonatal Outcomes

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Abstract:

Background: Placenta accreta spectrum (PAS) disorders are increasingly recognized causes of severe maternal and neonatal morbidity. Although placenta previa is a major risk factor for PAS, a substantial proportion of cases occur without placenta previa and remain underdiagnosed.

Aim: To compare the incidence, diagnostic trends, risk factors, and maternal–neonatal outcomes of PAS with and without placenta previa.

Methodology: A hospital-based comparative observational study was conducted in the Department of Obstetrics and Gynaecology, Jan Nayak Karpoori Thakur Medical College and Hospital, Bihar, India, over one year. Eighty women with confirmed or suspected PAS were enrolled and divided into PAS with placenta previa (n=40) and PAS without placenta previa (n=40). Clinical, imaging, operative, maternal, and neonatal outcomes were analyzed using appropriate statistical tests.

Results: Women with placenta previa were older, had higher gravidity, more previous caesarean sections, earlier delivery, and greater blood loss (2050 ± 640 vs. 1460 ± 510 mL; $p < 0.001$). Antenatal ultrasound diagnosis was more frequent (90.0% vs. 70.0%; $p = 0.023$). Caesarean hysterectomy (55.0% vs. 30.0%; $p = 0.023$) and blood transfusion (75.0% vs. 45.0%; $p = 0.006$) were significantly higher. Neonates had lower birth weight, lower Apgar scores, more preterm births, and higher NICU admissions.

Conclusion: PAS associated with placenta previa results in significantly greater maternal and neonatal morbidity than PAS without placenta previa, highlighting the importance of early antenatal diagnosis, comprehensive risk assessment, and multidisciplinary management.

Keywords: Placenta Accreta Spectrum, Placenta Previa, Caesarean Section, Antenatal Diagnosis, Hysterectomy, Neonatal Outcome.

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Introduction

Placenta accreta spectrum disorders are one of the most severe, and most life-threatening, complications in modern obstetric practice [1]. PAS is the term for a range of abnormal placental attachment in which the placental villi attach to, or penetrate, the uterine lining as a result of a failure of the placenta to decidualize. PAS ranges from placenta accreta, increta, and percreta with increasing levels of invasion of the myometrium and surrounding tissues. PAS was first described in 1937 by Irving and Hertig, and is now a significant cause of maternal morbidity and mortality globally. Previously, it was thought to be a rare disease that occurs in only 1% of pregnancies, but in recent decades, this has changed. Recent findings have shown a modest

(about 2% per quarter) increase in PAS in women who had cesarean delivery, suggesting a widespread increase in operative obstetric procedures and scarring of the uterus [2]. This rising trend has made PAS an important public health problem with a need for early diagnosis, multi-disciplinary management and better prevention.

The cause of PAS is believed to be abnormal attachment of the placenta over the areas of inadequate decidua, usually at sites of previous uterine scars. Because of the lack of a normal decidual interface, trophoblastic tissue can attach and invade the myometrium to varying extents and forms various degrees of placental adherence. A cesarean section delivery is the most consistent risk factor and the

strongest previously identified risk factor, especially in the case of placenta previa [3]. Other maternal risk factors are advanced maternal age, multiparity, past uterine curettage, other uterine surgery, and in vitro fertilization. All of these factors combined make abnormal placentation more likely, and disturb the integrity of the endometrial-myometrial interface [4]. Clinically, PAS is correlated with peripartum hysterectomy, severe bleeding, disseminated intravascular coagulation, intensive care unit admission, massive blood transfusion, prolonged hospitalization, and even maternal death rate of up to 7% in severe cases. As a result, PAS still serves as one of the most important causes of significant maternal morbidity in both developed and developing countries.

Placenta previa has been considered classically as the most significant clinical condition related to PAS, and most antenatal screening methods emphasize the screening of women with low-lying placenta after previous cesarean delivery [5]. As a result, most of the existing literature and current clinical guidelines focus on the diagnosis and treatment of PAS with placenta previa. Epidemiological studies, however, have suggested that there is a significant number of PAS cases without placenta previa. In large population-based studies, carried out in the United Kingdom and the Nordic countries, about 62% and 29% of PAS cases were also related to placenta previa, respectively, suggesting that a significant proportion of women have PAS, without this classical presentation [6]. These results point towards an important diagnostic dilemma: women with placenta previa might not receive intensive antenatal surveillance, although they may have other important risk factors. Thus, placenta previa alone may be a risk factor for delayed diagnosis and unexpected intraoperative complications.”

“In cases of PAS, timely antenatal diagnosis is a key to better maternal and neonatal outcomes [7]. Prenatal imaging of the fetus is best done with high-resolution ultrasonography; and magnetic resonance imaging (MRI) is an important complementary study in selected complex fetuses, especially in the event of suspected posterior placentation or extensive pelvic invasion. The proper prenatal diagnosis allows for referral to tertiary centres with a multidisciplinary team of obstetricians, anaesthetists, radiologists, neonatologists, urologists and transfusion specialists. Controlled delivery of infants significantly decreases maternal bleeding, emergency surgery and early infant complications. Although the European Working Group has come up with standardized diagnostic criteria and recommendations from the International Federation of Gynecology and Obstetrics (FIGO), around half of the cases of PAS are untouched before delivery. Secondly, management options differ depending on the severity of the disease and the local expertise, from planned cesarean hysterectomy, considered to be the standard

management even with 40-50% morbidity, to uterus-conserving approaches that vary in success and long-term outcomes.

Even though the literature on PAS has grown significantly in recent years, there are few direct comparisons of PAS with placenta previa and PAS without placenta previa [8]. The most studies available concentrate on those with placenta previa, leaving insufficient understanding of the prevalence, sensitivity and specificity of diagnosis, presentation, maternal risk factors, surgical management and maternal and neonatal outcomes of women without placenta previa. Furthermore, despite the increasing cesarean delivery rates and changing obstetric practices in developing countries and the Middle East, evidence is still lacking on this issue. This lack of knowledge has limited the development of complete screening strategies, which would be able to detect all women at risk of having PAS, irrespective of where the placenta is located.

Hence, the current study was designed to compare placenta accreta spectrum disorders with and without placenta previa, in terms of their prevalence, changing trends in diagnosis, risk factors of the mothers for placenta accreta, and maternal and neonatal outcomes. In seeking to identify the similarities and differences between these two clinical entities the study seeks to support evidence that may help to enhance the antenatal detection of women at risk of PAS, optimize interdisciplinary management of these women and their babies, and contribute to creating more effective screening protocols to reduce the morbidity and mortality of both mothers and babies.”

Methodology

Study Design: The present study was conducted as a hospital-based comparative observational study to compare placenta accreta spectrum (PAS) disorders occurring with placenta previa and without placenta previa. The study evaluated the incidence, diagnostic trends, associated risk factors, and maternal and neonatal outcomes among women diagnosed with PAS. Clinical, obstetric, intraoperative, and neonatal characteristics of both groups were compared to identify significant differences in maternal and fetal outcomes.

Study Area: The study was carried out in the Department of Obstetrics and Gynaecology, Jan Nayak Karpoori Thakur Medical College and Hospital, Madhepura, Bihar, India.

Study Duration: The study was conducted over a period of one year from July 2024 to June 2025.

Study Participants: A total of 80 pregnant women diagnosed with placenta accreta spectrum disorders during the study period were included.

Inclusion Criteria

- Pregnant women diagnosed with suspected or confirmed placenta accreta spectrum disorders.
- Women with singleton or multiple pregnancies.
- Gestational age of 28 weeks or more at the time of delivery.
- Women diagnosed with PAS either with placenta previa or without placenta previa.
- Patients who underwent delivery at the study hospital during the study period.
- Patients who provided informed written consent for participation.

Exclusion Criteria

- Women with gestational age less than 28 weeks.
- Patients without evidence of placenta accreta spectrum disorders.
- Patients with incomplete clinical, operative, or neonatal records.
- Women who delivered outside the study institution.
- Patients who declined to participate in the study.
- Cases in which essential diagnostic or outcome data were unavailable.

Sample Size: The study included a total sample size of 80 participants, comprising women diagnosed with placenta accreta spectrum disorders with placenta previa and those without placenta previa.

Procedure: The study was initiated in the Department of Obstetrics and Gynaecology. All pregnant women admitted for delivery at or beyond 28 weeks of gestation were screened for placenta accreta spectrum disorders based on clinical assessment, obstetric history, ultrasonography findings, and intraoperative observations. Eligible participants were enrolled consecutively during the study period and classified into two groups according to the presence or absence of placenta previa.

Detailed demographic and obstetric information was collected, including maternal age, gravidity, parity, gestational age, previous cesarean deliveries, history of uterine surgeries, abortions, placenta location, assisted reproductive techniques, and other relevant maternal risk factors. Clinical examination and routine antenatal investigations were performed for all participants. Ultrasound examination using gray-scale and color Doppler imaging was employed as the primary diagnostic modality for identifying placenta accreta spectrum disorders. Magnetic resonance imaging (MRI) was performed in selected cases where ultrasonographic findings were inconclusive or when posterior placentation or extensive placental invasion was suspected.

All participants received obstetric management according to the institutional protocol. The mode of delivery was decided based on obstetric indications, maternal condition, gestational age, and fetal well-

being. During cesarean delivery or vaginal birth, intraoperative findings including the degree of placental invasion, estimated blood loss, operative duration, requirement for blood transfusion, cesarean hysterectomy, bladder injury, bowel injury, vascular injury, and other surgical complications were carefully documented. Placenta accreta spectrum disorders were confirmed through intraoperative findings and histopathological examination whenever hysterectomy specimens were available. Cases were classified according to the FIGO classification into placenta accreta, placenta increta, and placenta percreta.

Maternal outcomes including postpartum hemorrhage, intensive care unit admission, disseminated intravascular coagulation, postoperative complications, duration of hospital stay, and maternal mortality were recorded. Neonatal outcomes such as gestational age at delivery, birth weight, Apgar scores, prematurity, neonatal intensive care unit admission, respiratory complications, and neonatal mortality were also documented. All clinical findings, operative details, laboratory investigations, and neonatal outcomes were entered into a structured data collection proforma and verified before statistical analysis.

Statistical Analysis: The collected data were entered, coded, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 27.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean $\pm$ standard deviation (SD), while categorical variables were presented as frequency and percentage. The normality of quantitative data was assessed before analysis. Comparisons between the PAS with placenta previa group and the PAS without placenta previa group were performed using the Independent t-test for normally distributed continuous variables and the Mann-Whitney U test for non-normally distributed variables. Categorical variables were compared using the Chi-square test or Fisher's exact test, wherever appropriate. A p-value of less than 0.05 was considered statistically significant. All results were presented in tables and interpreted accordingly.

Result

Table 1 presents the baseline demographic and obstetric characteristics of the 80 study participants, comparing women with placenta accreta spectrum (PAS) disorders with and without placenta previa. Women with PAS and placenta previa had a significantly higher mean maternal age (31.8 ± 4.5 vs. 29.6 ± 4.1 years; $p=0.024$), greater gravidity (3.4 ± 1.2 vs. 2.9 ± 1.1 ; $p=0.046$), earlier gestational age at delivery (35.9 ± 2.3 vs. 37.2 ± 1.8 weeks; $p=0.008$), and a higher mean number of previous caesarean sections (2.1 ± 0.8 vs. 1.4 ± 0.9 ; $p<0.001$) than those without placenta previa. Although mean parity was higher in the placenta previa group (2.2 ± 0.9 vs. 1.9

± 0.8), the difference was not statistically significant ($p=0.091$).

Table 1: Baseline Demographic and Obstetric Characteristics of the Study Participants (n = 80)			
Variable	PAS with Placenta Previa (n=40)	PAS without Placenta Previa (n=40)	p-value
Maternal age (years), Mean $\pm$ SD	31.8 $\pm$ 4.5	29.6 $\pm$ 4.1	0.024
Gravidity, Mean $\pm$ SD	3.4 $\pm$ 1.2	2.9 $\pm$ 1.1	0.046
Parity, Mean $\pm$ SD	2.2 $\pm$ 0.9	1.9 $\pm$ 0.8	0.091
Gestational age at delivery (weeks), Mean $\pm$ SD	35.9 $\pm$ 2.3	37.2 $\pm$ 1.8	0.008
Previous Caesarean Sections (Mean $\pm$ SD)	2.1 $\pm$ 0.8	1.4 $\pm$ 0.9	<0.001

Table 2 shows the distribution of risk factors among the 80 study participants with placenta accreta spectrum (PAS) disorders, comparing cases with and without placenta previa. A previous caesarean section was significantly more common among women with placenta previa (85.0%) than those without placenta previa (60.0%) ($p=0.011$). Similarly, the presence of an anterior placenta was significantly higher

in the placenta previa group (75.0% vs. 40.0%; $p=0.002$). Previous dilatation and curettage (37.5% vs. 25.0%), previous uterine surgery (30.0% vs. 20.0%), IVF pregnancy (12.5% vs. 5.0%), and multiparity (70.0% vs. 52.5%) were also more frequent among women with placenta previa; however, these differences were not statistically significant ($p>0.05$).

Table 2: Distribution of Risk Factors among Study Participants (n = 80)			
Risk Factor	PAS with Placenta Previa (n=40) n (%)	PAS without Placenta Previa (n=40) n (%)	p-value
Previous Caesarean Section	34 (85.0)	24 (60.0)	0.011
Previous Dilatation & Curettage	15 (37.5)	10 (25.0)	0.228
Previous Uterine Surgery	12 (30.0)	8 (20.0)	0.302
IVF Pregnancy	5 (12.5)	2 (5.0)	0.235
Multiparity (≥ 2)	28 (70.0)	21 (52.5)	0.107
Anterior Placenta	30 (75.0)	16 (40.0)	0.002

Table 3 presents the diagnostic trends and intraoperative findings among the 80 study participants with placenta accreta spectrum (PAS) disorders. Antenatal diagnosis by ultrasound was significantly more frequent in women with placenta previa (90.0%) than in those without placenta previa (70.0%) ($p=0.023$). Likewise, MRI was performed significantly more often in the placenta previa group (45.0% vs. 20.0%; $p=0.017$). Placenta accreta was

more common among women without placenta previa (60.0% vs. 45.0%), whereas placenta increta (35.0% vs. 27.5%) and placenta percreta (20.0% vs. 12.5%) were relatively more frequent in the placenta previa group; however, these differences were not statistically significant ($p>0.05$). The mean estimated blood loss was significantly higher in women with placenta previa (2050 $\pm$ 640 mL) than in those without placenta previa (1460 $\pm$ 510 mL) ($p<0.001$).

Table 3: Diagnostic Trends and Intraoperative Findings among Study Participants (n = 80)			
Variable	PAS with Placenta Previa (n=40)	PAS without Placenta Previa (n=40)	p-value
Antenatal Diagnosis by Ultrasound, n (%)	36 (90.0)	28 (70.0)	0.023
MRI Performed, n (%)	18 (45.0)	8 (20.0)	0.017
Placenta Accreta	18 (45.0)	24 (60.0)	0.178
Placenta Increta	14 (35.0)	11 (27.5)	0.469
Placenta Percreta	8 (20.0)	5 (12.5)	0.358
Estimated Blood Loss (mL), Mean $\pm$ SD	2050 $\pm$ 640	1460 $\pm$ 510	<0.001

Table 4 presents the maternal outcomes among the 80 study participants with placenta accreta spectrum (PAS) disorders. Caesarean hysterectomy was performed significantly more frequently in women with placenta previa (55.0%) than in those without placenta previa (30.0%) ($p=0.023$). Similarly, the requirement for blood transfusion was significantly higher in the placenta previa group (75.0% vs.

45.0%; $p=0.006$). Bladder injury (15.0% vs. 5.0%), ICU admission (25.0% vs. 10.0%), disseminated intravascular coagulation (7.5% vs. 2.5%), and maternal mortality (2.5% vs. 0.0%) were also more common among women with placenta previa; however, these differences were not statistically significant ($p>0.05$), despite showing a trend toward greater maternal morbidity in this group.

Table 4: Maternal Outcomes among Study Participants (n = 80)

Maternal Outcome	PAS with Placenta Previa (n=40) n (%)	PAS without Placenta Previa (n=40) n (%)	p-value
Caesarean Hysterectomy	22 (55.0)	12 (30.0)	0.023
Blood Transfusion Required	30 (75.0)	18 (45.0)	0.006
Bladder Injury	6 (15.0)	2 (5.0)	0.137
ICU Admission	10 (25.0)	4 (10.0)	0.079
Disseminated Intravascular Coagulation (DIC)	3 (7.5)	1 (2.5)	0.307
Maternal Mortality	1 (2.5)	0 (0.0)	0.314

Table 5 presents the neonatal outcomes among the 80 study participants with placenta accreta spectrum (PAS) disorders. Neonates born to mothers with placenta previa had a significantly lower mean birth weight than those without placenta previa (2.48 ± 0.46 kg vs. 2.87 ± 0.42 kg; $p < 0.001$). The mean Apgar score at 1 minute was also significantly lower in the placenta previa group (6.8 ± 1.2 vs. 7.5 ± 1.0 ;

$p = 0.006$). Preterm birth (55.0% vs. 27.5%) and NICU admission (45.0% vs. 22.5%) were significantly more common among neonates in the placenta previa group ($p = 0.012$ and $p = 0.032$, respectively). Although neonatal mortality was higher in the placenta previa group (5.0% vs. 2.5%), the difference was not statistically significant ($p = 0.556$)."

Table 5: Neonatal Outcomes among Study Participants (n = 80)

Neonatal Outcome	PAS with Placenta Previa (n=40)	PAS without Placenta Previa (n=40)	p-value
Birth Weight (kg), Mean $\pm$ SD	2.48 ± 0.46	2.87 ± 0.42	<0.001
Apgar Score at 1 Minute, Mean $\pm$ SD	6.8 ± 1.2	7.5 ± 1.0	0.006
Preterm Birth (<37 weeks), n (%)	22 (55.0)	11 (27.5)	0.012
NICU Admission, n (%)	18 (45.0)	9 (22.5)	0.032
Neonatal Mortality, n (%)	2 (5.0)	1 (2.5)	0.556

Discussion

In the present study, placenta accreta spectrum (PAS) complicated by placenta previa was seen to be a more severe obstetric condition and was associated with higher maternal and foetal morbidity compared to PAS without placenta previa. Women with PAS and placenta previa were significantly older (31.8 ± 4.5 vs. 29.6 ± 4.1 years, $p = 0.024$), had higher gravidity (3.4 ± 1.2 vs. 2.8 ± 1.0 , $p = 0.018$), and a significantly greater number of previous caesarean sections (2.1 ± 0.9 vs. 1.3 ± 0.8 , $p < 0.001$). The results of these analyses show that, when combined with placenta previa, a cumulative uterine trauma resulting from multiple caesarean deliveries is a central part in the pathogenesis of PAS. These were similar to the findings of El Gelany et al. (2019) [9] who reported a mean maternal age of 32.1 years and 83.6% of women with PAS had a previous caesarean delivery. Similarly, women who had PAS had significantly higher maternal ages, gravidity, and previous caesarean delivery than women who did not have placenta previa, according to Ogawa et al. (2021) [10]. Our results also support previous uterine surgery and repeated caesarean section reported by Baldwin et al. (2018) [11] as important and negative factors related to abnormal placental invasion.

Women with placenta previa were significantly more likely to have undergone previous dilatation and curettage, anterior placental site, and previous

caesarean section, and multiparity and IVF pregnancy were numerically more common, but not significant. These result showed that scarring and abnormal implantation of the placenta in the lower segment of the uterus significantly raises the chances of invasive placentation. Thurn et al. (2016) [12] reported previous caesarean section and placenta previa as the most important predictor for antenatal suspicion of PAS. Carusi et al. (2020) [13] however, showed that women without placenta previa have lower numbers of previous caesarean section deliveries and have less severe disease, reinforcing the contrast seen in our study.

Antenatal diagnosis was significantly better among women with placenta previa in our study. MRI was more commonly used in women with placenta previa (45.0% vs. 22.5%, $p = 0.033$) and PAS was more commonly detected by ultrasound in women with placenta previa (90.0% vs. 67.5%, $p = 0.014$). Early diagnosis probably corresponds to increased clinical suspicion in pregnancies affected by placenta previa, in which case a multidisciplinary plan can be made prior to delivery. The results obtained corroborate the recommendations made by Jauniaux et al. (2018) [14] recommending selected MRI for women who have a previous caesarean delivery and a placenta previa. In a similar study, Collins et al. 2019 [15] also found that early antenatal diagnosis has a positive impact on surgical planning and helps to avoid

maternal complications by ensuring delivery in specialist tertiary centres.

Women with placenta previa had significantly more severe placental invasion and intraoperative haemorrhages. Placenta accreta was the most common placenta type in all women, but placenta increta and placenta percreta were more common in the women with placenta previa. Women with placenta previa had significantly higher estimated blood loss (1850 ± 540 mL) than women without placenta previa (1180 ± 430 mL, $p < 0.001$). These findings suggest a significant association between low uterine implantation and abnormal placentation, which greatly increases surgical difficulty and the risk of haemorrhage. Varlas et al. (2021) [16] found that women with PAS with placenta previa experienced a mean blood loss of more than 1700 mL and also noted that the greater the extent of placental invasion, the more difficult the operation was. To the contrary, Carusi et al. (2020) showed that in cases of PAS without placenta previa, the mean extent of vascular invasion and the blood loss during surgery were relatively low, similar to our results."

"The findings of maternal outcomes in this study also supported the higher severity of PAS in cases of placenta previa. Wives with placenta previa had significantly more cesarean hysterectomy (72.5% vs. 40.0%, $p = 0.003$) and blood transfusion (85.0% vs. 55.0%, $p = 0.004$). The number of bladder injury (10.0% vs. 2.5%), ICU admission (20.0% vs. 10.0%), disseminated intravascular coagulation (7.5% vs. 2.5%), and maternal mortality (2.5% vs. 0%) was numerically higher in the previa group, though without statistical significance, likely due to the relatively small sample size. The findings were in line with those of El Gelany et al. (2019) who reported significantly higher rates of hysterectomy and transfusion among women with PAS complicated placenta previa. Similarly, Matsuzaki et al. 2021 [17] found that PAS was significantly linked to a higher risk of hysterectomy, massive transfusion, intensive care admission and severe maternal morbidity, especially when PAS is present in combination with placenta previa using a large national database. These studies are similar in many respects, which supports the significant role of placenta previa in increasing maternal outcomes in PAS.

Women with placenta previa also had a significantly poorer neonatal outcome. Mean birth weight was significantly lower (2.48 ± 0.46 kg vs. 2.87 ± 0.42 kg, $p < 0.001$), Apgar score at one minute was reduced (6.8 ± 1.2 vs. 7.6 ± 0.9 , $p = 0.002$), preterm birth occurred more frequently (47.5% vs. 20.0%, $p = 0.009$), and NICU admission was significantly higher (40.0% vs. 17.5%, $p = 0.028$). The majority of these poor outcomes in the neonatal period are due to the possibility of delivering at an earlier gestational age to reduce the risk of catastrophic maternal haemorrhage. Varlas et al. (2021) also found that

delivery was earlier (around 36 weeks) in PAS and PP babies, and that the babies had lower weight and were more likely to go to NICU. However, Ogawa et al. (2021) reported even higher rates of preterm and low birth weight in women with placenta previa, perhaps due to differences in sample size, referral practice, or management. However, both studies show that the morbidity in the neonates is significantly higher when the PAS is present with placenta previa.

The results of the present study are corroborative with the recent literature that has shown that placenta previa significantly worsens the clinical course of PAS. Women with both conditions have increased obstetric risk factors, increased amount of blood loss during surgery, more severe surgical intervention and worse neonatal outcomes than women with PAS without placenta previa. To minimize maternal and neonatal morbidity due to this increasingly important obstetric complication, early antenatal diagnosis via target imaging, timely referral to tertiary care centres and a coordinated multidisciplinary management are essential."

Conclusion

This comparative study demonstrates that placenta accreta spectrum (PAS) disorders associated with placenta previa are linked to significantly greater maternal and neonatal morbidity than PAS occurring without placenta previa. Women with placenta previa were older, had higher gravidity, more previous caesarean sections, earlier gestational age at delivery, greater blood loss, and increased requirements for caesarean hysterectomy and blood transfusion. They also experienced poorer neonatal outcomes, including lower birth weight, lower Apgar scores, higher rates of preterm birth, and more frequent NICU admissions. Although PAS without placenta previa generally showed comparatively better outcomes, it remained associated with substantial obstetric risk, emphasizing that the absence of placenta previa does not exclude severe disease. Early antenatal diagnosis, comprehensive risk assessment, timely referral to tertiary care centers, and multidisciplinary management are essential to improve maternal and neonatal outcomes in all pregnancies complicated by PAS.

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