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Research Article

Maternal and Fetal Outcome in Placenta Accreta Spectrum (PAS): A prospective Study at Minia University Maternity Hospital

Ahmed Kotb Ahmed Abdel-Hakeem[1], Mohamed Tawfeeq GadElrab[1], Shereen Ragaiee Mohamed Mohamed[1] and Osama Ahmed Ibrahim[1]
[1] Department of Obstetrics and Gynecology, Faculty of Medicine, Minia University, Egypt

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Abstract
Aim: This study aimed to evaluate maternal and fetal outcome in placenta accreta spectrum cases at Minia University Maternity hospital. **Methods:** A prospective study was conducted in Minia University Maternity hospital in the period between June 2024 till February 2025. Study included 100 patients. Outcome measures: Maternal outcome measures. included: Estimated blood loss, Amount of blood transfusion, Mode of delivery, Complications, pre and postoperative, hemoglobin level, ICU admission and Neonatal outcome measures included: Neonatal weight, APGAR score, Prematurity, NICU admission, IUFD. **Results:** Our results showed that, 75% of cases had Placenta accreta, 17% of cases had Placenta increta, and 8% of cases had Placenta percreta. mean of hemoglobin (pre) was 11.13 ±1.33 g/dl with range 11.3 (7.5-14), mean of Visual assessment of blood loss was 1417.5 ±570.81 cc, with range 1500 (750-300), mean of Blood transfusion was 3.08 ±1.5 units with range 3 (1-10) , and mean of hemoglobin(post) was 8.97 ±1.8 g/dl with range(5 - 12.7) , 14% of cases entered ICU, while 86% of cases entered HDU, no cases were dead, 4% of cases required Ventilatory support, 10% of cases required Hemodynamic support, 13% of cases preformed Primary Cs hysterectomy, 5 % performed secondary Cs hysterectomy , 11% of cases had Postpartum hemorrhage, 18% of cases had UB injury, and 2% of cases had Acute kidney injury. **Conclusion**: placenta previa has higher incidence rate with increasing number of previous caesarean section deliveries. Placenta previa patients at risk of maternal and neonatal morbidities,maternal morbidities include life threatening haemorrhage, caesarean hysterectomy, blood transfusion, and ICU admission. Neonatal morbidities include premature delivery, low birth weight, intrauterine fetal death and NICU admission.

Keywords: placenta accreta spectrum, placenta previa, accreta, increta, percreta, maternal and fetal outcome

Introduction
The term "placenta accreta spectrum" (PAS) refers to a group of illnesses caused by an abnormally attached placenta. These disorders include placenta accreta, increta, and percreta [(1)].

Placenta previa is strongly associated with PAS and is usually detected in the mid-pregnancy period; this enables clinicians to prepare for preventing postpartum hemorrhage before delivery This gives them time to take precautions, such collecting blood for an autologous transfusion, before the baby is born. (The study conducted by Ogawa and colleagues in 2022")

The most prevalent cause of PAS is aberrant placentation due to a decidua deficiency or susceptibility; this is seen most frequently in cases when the mother has had a prior caesarean procedure and the placenta previa is present. (The study conducted by [(2)]

Some other recognised risk factors include the mother's advanced age, a history of uterine

curettage, and the use of artificial reproductive technology (ART) for conception. In [3]

PAS is a leading cause of maternal mortality and a major obstetrical emergency; it affects about 0.4% of pregnancies and is widely believed to be among the leading causes of PPH [4].

It is crucial to diagnose PAS during pregnancy and manage it interdisciplinaryly since it raises the risk of serious complications during childbirth, including hysterectomy, end organ damage, maternal death, and major obstetric haemorrhage. (Abrahamad and Morgan, 2022)

Cases with PP and PAS undergo surgery in accordance with established local protocols. An obstetrician consultant is to oversee the management of all PP cases in accordance with this procedure. In addition, a second expert is kept on standby in the operating area to control any excessive bleeding or PAS findings immediately [5].

Throughout the research period, the management protocol remained unchanged. At 38 weeks gestation, or between 36 and 37 weeks if preeclampsia was suspected, an elective caesarean section was scheduled according to the protocol. It was stated by Orlando et al., in 2021.

Aim of the work

In order to assess the effects on mother and child in cases of placenta accreta spectrum (PAS) at Minia University Maternity Hospital (MUMH), during the course of nine months beginning in June 2024 and ending in February 2025.

Patients and Methods

Minia University Maternity Hospital was the site of this prospective study that included women with placenta accreta spectrum (PAS). From June 2024 until February 2025, a period of nine months

Eligibility requirements:

• Women confirmed to have placenta accreta spectrum (PAS) during their pregnancies.

• Patients who were seen in the hospital, guaranteeing that they had access to obstetric specialists.

Diagnosis is made between the ages of 24 and 40 weeks of gestation.

Ineligibility requirements:

Patients who have severe preeclampsia, eclampsia, or uncontrolled diabetes mellitus as well as any other co-existing medical disorders will not be eligible for participation.

• Carrying a large number of children (e.g., multiples, quads).

• Maternal age being less than 18 or more than 45 years-old.

Having a gestational age of 24 weeks or more at the time of diagnosis is not acceptable.

Ultrasound through the abdomen (TA):

TA, pictures were sagittal and parasagittal, with an angular range from the middle to the edges. The transverse plane pictures were taken at an angle to the pelvis and above and below the bladder, starting at the midline. In cases where the bladder's fluid level is low, imaging can be done by positioning the transducer over the side of the bladder and directing it to the other side. A better functioning acoustic window and more fluid for the US beam to travel through were both made possible by this.

Procedure:

Operative time, anticipated blood loss during surgery, units of packed red blood cell (PRBC) transfusion given, and whether the caesarean section was elective or performed as an emergency were all factors included in the review.

• Use gauze and suction bottles to manually weigh blood to determine intraoperative blood loss. Postpartum haemorrhage volumes more than 1500 mL collected within 2 hours after surgery are considered to be interaoperative large haemorrhage.

• A blood cell analyser was used to obtain the level of preoperative maternal haemoglobin, which was determined from the last tested haemoglobin before delivery.

Although difficult, visual evaluation of blood loss during PAS surgery is crucial. Even while it's not always the most precise method, it's usually the only one that's available right now. Typically, it is performed during surgery in this way:

1. Methods for Visual Quantitative Estimation:
   a. Containers for Soaks

Check the suction canisters for fluid volume.

Estimate actual blood loss by removing irrigation fluid.

b. Mats and Sponges for Operation

It is predicted that 100-150 mL of blood can be found in a completely wet lap sponge.

c. Floor and curtains

• Determine the likelihood of blood pooling on the floor or curtains used in the surgery.

d. Sponges for Weighing (An Improved Visual Aid)

Compare the weight of dry and wet sponges in order to determine the amount of blood absorbed.

One millilitre of blood is equivalent to one gramme of heavier sponge.

2. Team Coordination for Clinical Judgement

• Visual indicators (such as excessive bleeding or seeping surfaces), changes in haemodynamics (blood pressure, heart rate, etc.), and the difficulties of uterine tone and placental separation are all factors that experienced anaesthesiologists and surgeons take into account.

Results

This prospective study including women with placenta accreta spectrum (PAS) at Minia University Maternity Hospital For 9 months from June till February 2025.

This study administered to all women placenta accreta spectrum (PAS).

This study **100** Pregnant females diagnosed with placenta accreta spectrum (PAS) by ultrasound.

Pre-coded data will be processed and statistically analyzed by using the statistical package of the social science software (SPSS), version 21.

Results

Table (1): Distribution ofPlacental types in the studied group.

	Studied group N= 100
Placental types	
Placenta acreta	75 (75%)
Placenta increta	17 (17%)
Placenta percreta	8 (8%)

This table shows that, 75% of cases had Placenta acreta, 17% of cases had Placenta increta, and 8% of cases had Placenta percreta

Table (2): Distribution ofMaternal Blood Loss and Hematological Status in the studied group.

	Studied group N= 100
Hemoglobin (pre) (g/dl) **Mean ±SD** **Range**	 11.13 ±1.33 7.5-14
Hemoglobin (post) (g/dl) **Mean ±SD** **Range**	 8.97 ±1.8 5 - 12.7
Visual assessment of blood loss (cc) **Mean ±SD** **Range**	 1417.5 ±570.81 750-3000
Blood transfusion (units) **Mean ±SD** **Range**	 3.08 ±1.5 1-10

SD: Standard deviation.

This table shows that, mean of hemoglobin was 11.13 ±1.33 g/dl with range from 7.5 to 14, mean of hemoglobin post-operative was 8.97 ±1.8 g/dl with range from 5 to 12.7, mean of Visual assessment of blood loss was 1417.5 ±570.81 cc, with range from 750 to 3000, and mean of Blood transfusion was 3.08 ±1.5 units with range from 1 to 10.

Table (3): Distribution of Maternal complications in the studied group.

	Studied group N= 100
ICU / HDU admission	
ICU	14 (14%)
HDU	86 (86%)
Maternal mortality	0 (0%)
Ventilatory support	4 (4%)
Hemodynamic support	10 (10%)
Primary Cs hysterectomy	13%(13%)
Secondary Cs hysterectomy	5% (5%)
Postpartum hemorrhage	11 (11%)
UB injury	18 (18%)
Acute kidney injury	2 (2%)

UB injury: urinary bladder Injury, ICU: Intensive Care Unit, HDU: High Dependency Unit.
This table shows that, 14% of cases entered ICU, while 86% of cases entered HDU, no cases were dead, 4% of cases required Ventilatory support, 10% of cases required Hemodynamic support, 13% of cases performed primary Cs hysterectomy, 5% of cases performed secondary Cs hysterectomy 11% of cases had Postpartum hemorrhage, 18% of cases had UB injury, and 2% of cases had Acute kidney injury.

Discussion

In prenatal development is supported by the placenta, an important organ. PAS, which occurs when trophoblastic tissue abnormally binds to the myometrium of a pregnant woman's uterus, is one clinical issue with placental development [(6)].

One definition of placenta accreta spectrum is an aberrant invasion of the placenta into the myometrium of the uterine wall, either partially or completely. [(7)] found that for every 10,000 births, there is an incidence of placenta accreta spectrum. Although estimates varied greatly because to variations in diagnosis standards and healthcare settings, the prevalence of PAS has been on the rise globally. In 2024, [(8)] published their findings.

Placenta accreta spectrum (PAS) disorders have emerged as a major cause for concern in the field of obstetrics, with a reported death rate of around 7.0% and an incidence rate that has jumped from 0.12% to 0.31 percent in the past 30 years. [(9)] also found that it is associated with a significant amount of maternal morbidity, such as hysterectomy, urinary tract injury, and major blood transfusions.

Thus, while placenta previa is present, the likelihood of placenta accreta spectrum (PAS) increases, with incidence rates varying between 11% and 25%. In addition, research shows that the risk is enhanced by 5% to 10% for every past caesarean delivery[(10)], and it increases dramatically with each prior caesarean.

For women suffering with PAS, no randomised controlled trial has yet investigated the various therapy alternatives. Despite hysterectomy being the gold standard for treating PAS, there is new evidence that conservative procedures can lessen the amount of blood lost during CS. [(11)]

When screening for PAS at a patient's regular clinical visit, ultrasound is the most practical method. Ultrasound results from many institutions formed the basis of numerous PAS grading systems (Yang et al., 2022).
Placenta accreta spectrum (PAS) was the focus of this research, which sought to assess maternal and foetal outcomes.

Minia University Maternity Hospital recruited one hundred pregnant women with a placenta accreta spectrum (PAS) diagnosis for this prospective study.

Here are the key takeaways from the study:
In our study, we found that the average age of the mothers was 30.01 ±5.01 years, with a range of 30–45. The average gravidity was 4.19

±1.73, with a range of 4–10, and the average parity was 2.5 ±1.3 with a range of 2.5–7. The average number of caesarean sections was 2.68 ±1.24, with a range of 2.5–1-6.

Thirty patients were enrolled in the trial, which is in agreement with our findings [12]. Patients' ages ranged from 26 to 45 years, with a median of 35 years. They had a median of 3 pregnancies, ranging from 1 to 7, and 1.7 caesarean deliveries, ranging from 0 to 5.

In line with the findings of [13], the purpose of this study was to examine the therapeutic management and counselling of patients involving placenta accreta spectrum (PAS) in conjunction with placenta previa. The researchers discovered that the average age of the mothers was 34±3.44 years. In terms of parity, all of the patients had had at least one caesarean section before, with 83.3% of the patients having had two and 16.7% having only one.

Similarly, [14] sought to assess the results of various individual management options for PAS by analysing accessible cases from a tertiary perinatal centre. The median parity (number of pregnancies before giving birth) was 1, and the median maternal age was 31, according to their report.

On the subject of parity, [15] discovered that 35 percent of cases had P1 and 65 percent had P2 when it came to the mode of prior deliveries. The mean maternal age (in years) was 26.25±3.22, ranging from 23 to 34. 10% of patients had no surviving children, 60% had one living child, and 40% had two living children; 35% of cases had previous one caesarean section and 65% had previous two caesarean sections.

Out of 1647 patients, 265 had a placenta accreta spectrum and 1382 did not, according to [16], who sought to describe the neonatal outcomes in pregnancies complicated with PAS compared with pregnancies not complicated by PAS.

Our findings revealed that 75% of patients had an accreta placenta, 17% had an increta placenta, and 8% had a percreta placenta.

Considering the topography of the placenta previa, [13] discovered that 75% of the cases had the anterior type and 25% had the posterior type.

In addition,[17] observed that out of 115 patients, 13.7% had a major anterior placenta, 10.4% a major posterior placenta, and 53.9% a complete centralis placenta.

Our research revealed that the average pre-hemoglobin level was 11.13 ±1.33 g/dl, ranging from 7.5 to 14.5; the average visual assessment of blood loss was 1417.5 ±570.81 cc, ranging from 750 to 300; the average number of units of blood transfusion was 3.08 ±1.5, ranging from 3 to 10, and the average post-hemoglobin level was 8.97 ±1.8 g/dl, ranging from 5.27 to 12.4.

Our results are in line with those of [12], who also discovered that the average haemoglobin (Hgb) level ranged from 8.1 to 13.7 g/dL.

It was also noted by[15] that patients' haemoglobin levels were measured both prior to and following the CS. After the operation, the average haemoglobin level dropped to 10.7 ± 0.5 g/dl from 11.3 ± 0.4 g/dl before the procedure. The statistical significance of this discrepancy was not established. A mean estimated blood loss (EBL) of 1.1 ± 0.2 (L) and a mean transfusion unit (TU) of 2.1 ± 0.3 (units) were recorded during the first set of interventions, which was a caesarean section.

The estimated intraoperative blood loss, measured in millilitres (ml), had a median (Q1, Q3) of 1600 (1100, 2750), as reported by [14]. In addition, FYALA et al., (2018) discovered that with a range of 300-7000, the median blood loss was 1800 and the median number of transfusions was 3, with a range of 0-12.

Based on our findings, 14% of patients ended up in the intensive care unit, 86% ended up in the high-dependency unit, no patients died, 4% needed mechanical ventilation, 10% needed haemodynamic support, 13% had a primary C-section hysterectomy, 5% had a secondary C-section hysterectomy, 11% experienced post-partum haemorrhage, 18% had a uterine bulge injury, and 2% had acute kidney injury.

According to [14], a bladder damage was the sole recorded surgical complication in a woman who had her fifth caesarean section during an emergency delivery because of prenatal haemo-

rrhage and concerns about foetal distress; 13% of these instances ended up in the neonatal intensive care unit. All births were officially recorded as live, and the research cohort did not experience any maternal death.

Researchers [18] set out to assess PAS women's demographics, risk factors, fetal-maternal outcomes, and treatment choices. They discovered that 82.05 percent of patients involved hysterectomy, 25.64 percent involved bladder injury, 33.33 percent needed ventilator support, and 79 percent involved the intensive care unit.

Our research revealed that the average gestational age was 36.72 ±1.11 weeks, with a range of 33–39 weeks. The average birth weight was 3.07 ±0.41 kg, with a range of 3–4.5 kg. The average APGAR score was 7.5 ±1.37, with a range of 8–8, and 13% of the newborns had to be admitted to the neonatal intensive care unit (NICU). Tragically, 5% of these instances were fatal.

According to[13], who also found an average birth weight of 2696.3±466.3 grammes and a mean gestational age of 35.8±2.3, 8.33% of the cases admitted to the neonatal intensive care unit were in conformity with our findings. The average gestational age at delivery (in weeks), according to Adel et al., (2022), was 35.7±1.34, with a range of 34 to 38.

The median APGAR score after 5 minutes was 9, the median gestational age at delivery was 37 weeks, and 41% of cases were admitted to the neonatal intensive care unit (NICU), according to [14].

Furthermore, the average Apgar score at 1', 5', and 10' minutes was 8.7, 6.8, and 8.7 correspondingly, according to [12]. The average birth weight was 2435 g, with a range of 950-3450 g. In addition, the study by Toussia-Cohen et al., (2024) found that, on average, babies were 36 weeks gestational age at caesarean section, 2660 grammes at birth weight, 8.3% with an APGAR score of 5 minutes or lower, and 29.8% admitted to the neonatal intensive care unit.

Consistent with our findings Researchers [1] separated 390 placentas into three groups: those located posteriorly (n=89), anteriorly (n=60), and non-centrally (n=241). Their goal was to determine how placental site affected the severity of placenta accreta spectrum (PAS). In terms of gestational age, they discovered a statistically significant difference between the groups that were tested (P= 0.01).

Feng et al., (2024) divided 118 patients into three groups according to placental location: 59 patients were placed anteriorly, 52 patients posteriorly, and 7 patients lateral to the wall or fundus. The purpose of the study was to examine the prenatal diagnosis, clinical characteristics, and perinatal outcomes of placenta accreta spectrum in different placental locations. With p-values of0.151,0.165,0.256, and0.408, respectively, for birth weight, bladder damage, intensive care unit admission, and estimated blood loss in 24 hours, the researchers found no statistically significant difference between the groups.

Conclusion

We looked at the placenta accreta spectrum (PAS) and its effects on the mother and the baby.

According to our results, there was a significant difference between the groups when it came to UB injury, gestational age, APGAR score, and NICU admission; however, there was no statistically significant difference when it came to maternal mortality, postpartum haemorrhage, acute kidney injury, birth weight, or ICU / HDU admission.

Thus, we determined that although there were no significant variations in neonatal survival rates, ventilator or haemodynamic support demands, or maternal death, there were substantial disparities in particular problems such as uterine injury and gestational age at birth.

Recommendations

Future research should preferably employ large-scale comparative observational studies or carefully planned randomised controlled trials.

Include a group of patients that are typical in terms of age, gender, and the severity of their illness.

Future research should ensure that their sample sizes are sufficiently large to draw significant results while also controlling for potential confounding factors.

Studies need a longer duration of follow-up in order to properly evaluate long-term effects.
In order to validate our findings, we suggested that future research use multicenter trials.

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