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MORBIDLY ADHERENT PLACENTA (MAP): STUDY OF MATERNAL AND PERINATAL OUTCOME IN MAP AT A TERTIARY CARE CENTER

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Abstract

Background: Placenta accreta spectrum is a pathologic condition of placentation in which the villous tissue adheres or invades the uterine wall. Present study was aimed to study cases of abnormal placentation in the form of placenta accreta spectrum and the maternal and perinatal outcomes associated with it in our hospital. **Material and Methods:** Present study was single-center, prospective, observational study, pregnant female, gestational age>32weeks, with morbidly adherent placenta diagnosed antenatally by USG/ DOPPLER/ MRI or per operatively (on table). Maternal & Perinatal, outcomes & parameters were studied. **Results:** Among 58 patients' majority were (43.1%) of the age group of 30 to 34 years, were third gravida (41.4%), 33 (56.9%) delivered before 37 weeks of gestation. 56 (96.6%) patients had at least one LSCS in past pregnancies, 22 (37.9%) had prior curettage, 20 (34.5%) had prior LSCS and curettage, 49 (84.5%) had associated placenta previa. 31 out of 58 patients (53.3%) were diagnosed with morbidly adherent placenta antenatally on ultrasound doppler or MRI and 27 patients (46.6%) were intraoperatively (on table) diagnosed. 33 (56.9%) were diagnosed with placenta percreta, 16 (27.6%) had placenta increta and 9 (15.2%) were diagnosed with placenta accreta. 48 (82.8%) patients had hysterectomy as the first line of treatment. 47 patients (81%) were shifted to ICU, 23 patients (39.7%) had bladder injuries due to placenta percreta invading the bladder, 30 patients (51.7%) had haemorrhagic shock, sepsis was seen in 3 (5.2%) patients, 2 patients (3.4%) landed in DIC and there were 3 (5.2%) mortalities. 33 (56.8%) neonates had APGAR score at 5 mins of < 7, 58.6% were born preterm, 55.1% required NICU admissions, and 13.7% died

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in neonatal period. **Conclusion:** Morbidly adherent placenta is one of the most devastating complications in pregnancy, associated with significant and increased maternal and perinatal mortality and morbidity.

Keywords: Morbidly adherent placenta, maternal mortality, perinatal morbidity, placenta accreta

Introduction

Placenta accreta spectrum is a pathologic condition of placentation in which the villous tissue adheres or invades the uterine wall.[1] Both the adherent and invasive grades of placenta accreta spectrum lead to failure of parts or the whole placenta to separate spontaneously from the uterine wall at delivery.[2] This is associated with highly increased maternal and perinatal morbidity and mortality.

The incidence of placenta accrete, approximately being 1 in every 2500 deliveries, has increased dramatically over the last three decades due to the increase in caesarean delivery rate, prior uterine surgery, myomectomy and curettage. In addition to caesarean section being associated with abnormal placentation, more ominously, placenta previa has been shown to be associated with a high rate of placenta accrete.[3]

The maternal mortality risk may reach 7 % as opposed to less than 1% in cases with normal placentation and most cases of placenta increta and percreta require complex surgical management that often involves different surgical specialists, interventional radiologists, intensivist anesthesiologists, hematologists neonatologists and the extensive surgery related morbidities include massive transfusions, infections, urologic injuries and fistula formation.[4.5]

The use of color and 3D Doppler ultrasound is also helpful in diagnosing placenta accreta. MRI may be helpful when the diagnosis is uncertain, if posterior invasion is concerned, or if percreta/invasion of other surrounding organs is suspected. Present study was aimed to study cases of abnormal placentation in the form of placenta accreta spectrum and the maternal and perinatal outcomes associated with it in our hospital.

Material And Methods

Present study was single-center, prospective, observational study, conducted in department of Obstetrics and Gynecology, at XXX medical college & hospital, XXX, India. Study duration was of 1 year (January 2021 to December 2022). Study approval was obtained from institutional ethical committee.

Inclusion criteria

- Pregnant female, gestational age>32weeks, with morbidly adherent placenta diagnosed antenatally by USG/ DOPPLER/ MRI or per operatively (on table), willing to participate in present study

Exclusion criteria

- Gestational Age less than 32 weeks
- Patients per operatively not found to have morbidly adherent placenta

Study was explained to patients in local language & written consent was taken for participation & study. All the cases underwent thorough history taking, clinical examination, routine investigations (Blood grouping, CBC, BT, CT, Platelet count, PBF, Urine routine

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exanimation, TSH, T3, T4, HIV, VDRL, HbsAg, GCT, Ultrasonography/ MRI/ Doppler), findings were noted in proforma.

Maternal outcomes & parameters studied were mode of presentation of the patient, gestational age, time of Diagnosis, history of previous lower segment/classical Caesarean section/ Hysterotomy/ Myomectomy, history of Placenta Previas in Current/ Previous Pregnancies, history of other intrauterine operative procedure (dilatation and curettage, manual removal of placenta, etc.), mode of delivery of the current pregnancy, management, transfusion of blood & blood products, complications (Ureteric/ Bladder/Gut injury, ICU/HDU/CCU Admissions, Sepsis, DIC, Shock), duration of hospital stay & mortality. Perinatal outcomes studied were APGAR score at 5 minutes, birth weight, morbidities (Neonatal jaundice, birth asphyxia, anemia, prematurity), admissions to NICU & mortality.

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel). Statistical software SPSS (version 20.0) and Microsoft Excel were used to carry out the statistical analysis of data. Continuous variables were expressed as Mean ± SD and categorical variables were summarized as percentages.

Results

A total of 58 patients with gestational age of 32 weeks or more with morbidly adherent placenta, either diagnosed antenatally (on ultrasound doppler or MRI) or during surgery (intraoperatively) were studied.

25 out of 58 patients (43.1%) were of the age group of 30 to 34 years with the mean age being 32.1±3.94 years. Out of 58 patients 34 (58.6%) were booked, 19 (32.8%) were unbooked and 5 (8.6%) were referred. 24 patients (41.4%) were third gravida with mean gravidity of 3.2±0.954. 33 (56.9%) delivered before 37 weeks of gestation with mean gestational age at delivery being 35.8±2.07 weeks.

Table 1: General characteristics

Characteristics	Number	Percentage
Age (Years)		
20-24	3	5.2
25-29	13	22.4
30-34	25	43.1
35-39	17	29.3
Mean ± SD (Range)	32.1±3.94 (23-38)	
Registration status		
Booked	34	58.6
Unbooked	19	32.8
Referred	5	8.6
Gravidity		
Gravida 2	12	20.7
Gravida 3	24	41.4
Gravida 4	16	27.6
≥ Gravida 5	6	10.3
Gestational age (weeks) at delivery		

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32 to <34	10	17.2
34 to <37	23	39.7
≥ 37	25	43.1
Mean ± SD (Range)	35.8±2.07 (32-39)	100

56 (96.6%) patients had at least one LSCS in past pregnancies, 22 (37.9%) had prior curettage, 20 (34.5%) had prior LSCS and curettage, 49 (84.5%) had associated placenta previa, 3 (5.2%) had prior hysterotomy and 1 (1.7%) patient had prior myomectomy for infertility.

Table 2: Obstetric history of study patients

Obstetric history	Number	Percentage
Previous LSCS	56	96.6
Previous 1 LSCS	24	41.4
Previous 2 LSCS	30	51.7
Previous 3 LSCS	2	3.4
Prior curettage	22	37.9
Prior curettage & previous LSCS	20	34.5
Prior D&E	2	3.4
Prior hysterotomy	3	5.2
History of MRP	1	1.7
Prior Myomectomy	1	1.7
Placenta previa in previous pregnancies	8	13.8
Placenta previa in current pregnancy	49	84.5

31 out of 58 patients (53.3%) were diagnosed with morbidly adherent placenta antenatally on ultrasound doppler or MRI and 27 patients (46.6%) were intraoperatively (on table) diagnosed. 33 (56.9%) were diagnosed with placenta percreta, 16 (27.6%) had placenta increta and 9 (15.2%) were diagnosed with placenta accreta.

Table 3: Time of diagnosis & spectrum of morbidly adherent placenta

Time of diagnosis	Number	Percentage
Antenatal	27	46.6
Intraoperative	31	53.4
Spectrum	Number	Percentage
Accreta	9	15.5
Increta	16	27.6
Percreta	33	56.9

Majority of the patients (86.2%, 50 out of 58) had moderate anaemia (Hemoglobin ranging from 7 to 9.9 g%). Mean intraoperative blood loss was 1681.1± 446.2 ml with 24 (41.1%) patients suffering with blood loss of 2000 to 2500 ml.

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Table 4: Intraoperative blood loss (ml)

Intraoperative blood loss (ml)	Number	Percentage
1000-1499	9	15.5
1500-1999	23	39.7
2000-2499	24	41.4
≥ 2500	2	3.4
Mean ± SD (Range)	1681.1 ± 446.2 (1000-3500)	100

100% of patients required packed cell volume (PCV) and fresh frozen plasma (FFP) transfusions. 43 out of 58 patients (74.1%) required up to 4 units of PCV transfusions and 38 out of 58 patients (65.5%) required up to 4 units of FFPs.

Table 5: PCV and FFP transfusion in study patients

Units	PCV transfusion		FFP transfusion	
	Number	Percentage	Number	Percentage
1-2 units	14	24.1	14	24.1
3-4 units	43	74.1	38	65.5
> 4 units	1	1.7	6	10.3

48 (82.8%) patients had hysterectomy as the first line of treatment, 5 (8.6%) patients underwent hysterectomy following trial of other procedures like bilateral uterine artery ligation, bilateral internal iliac artery ligation and balloon tamponade, 3 (5.2%) patients were managed by procedures other than hysterectomy (Bilateral internal iliac Artery Ligation; Balloon Tamponade; Bilateral Uterine Artery Ligation) and 2 (3.4%) underwent subtotal hysterectomy.

Table 5: Treatment modality in study patients

Treatment modality	Number	Percentage
Hysterectomy with other procedure	5	8.6
Hysterectomy without other procedure	48	82.8
Subtotal hysterectomy	2	3.4
Other procedure without hysterectomy	3	5.2

47 patients (81%) were shifted to ICU, 23 patients (39.7%) had bladder injuries due to placenta percreta invading the bladder, 30 patients (51.7%) had haemorrhagic shock, sepsis was seen in 3 (5.2%) patients, 2 patients (3.4%) landed in DIC and there were 3 (5.2%) mortalities.

Table 6: Maternal outcome of study patients

Maternal outcome	Number	Percentage
ICU admission	47	81.0
Bladder injury	23	39.7
Shock	30	51.7
Sepsis	3	5.2
DIC	2	3.4
Acute Renal Shutdown	2	3.4

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Mortality	3	5.2

44 out of 58 patients (75.9%) were hospitalized for 7 to 14 days. Mean duration of hospital stay was 10.4 ± 4.73 days.

Table 7: Duration of hospital stay in study patients

Hospital stays (Days)	Number	Percentage
< 7 Days	6	10.3
7-14 Days	44	75.9
> 14 Days	8	13.8
Mean ± SD (Range)	10.4±4.73 (1-26 Days)	100

33 (56.8%) neonates had APGAR score at 5 mins of less than 7/10. 34 out of 58 neonates (58.6%) were born preterm, 32 out of 58 (55.1%) required NICU admissions, 31 (53.4%) suffered from respiratory distress and 8 (13.7%) died in neonatal period.

Table 8: Neonatal outcome

Neonatal outcome	Number	Percentage
Apgar score at 5 minutes		
< 7	33	56.9
≥ 7	25	43.1
Mean ± SD (Range)	6.7 ± 1.88 (2-10)	
Neonatal outcome		
NICU admissions	32	55.1
RDS	31	53.4
Prematurity	34	58.6
Jaundice	8	13.8
Neonatal death	8	13.7

Discussion

Caesarean deliveries are an essential component of a functioning and comprehensive maternity system in all countries; health interventions, in particular in low-income countries, have been focused mainly on access to safe obstetric surgical and anesthesia procedures. However, population studies[6] and a recent systematic review and metanalysis[7] have shown a strong association between cesarean delivery rates, number of previous cesarean deliveries, and incidence of accrete placentation in subsequent pregnancies.

MAP (morbidly adherent placenta) has been defined clinically as placenta adherent to the uterine wall without easy separation and/or bleeding from the placental bed at cesarean delivery with difficult manual and/or piecemeal removal of the placenta and histopathologically is defined as absence of decidual layer /nitabuch layer between the placenta and myometrium with direct attachment of the villous tissue to the uterine musculature.

Currently the management options for MAP include:

1. Conservative and
2. Extirpative approaches[8]

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The conservative strategy entails[9]

1. Leaving the placenta in situ which may be followed by medical management with methotrexate.
2. Uterine artery embolization.
3. Internal iliac artery ligation/embolization,
4. Hysteroscopic loop resection or dilatation and curettage.

There was a total of 22,838 deliveries conducted in our centre during this time period, out of which 58 patients were diagnosed with morbidly adherent placenta with an incidence of 2.5 per 1000 pregnancies. This was in concordance with study conducted by Higgins MF *et al.,*[10] with incidence of 2.37 cases of morbidly adherent placenta per 1000 pregnancies.

25 patients (43.1%) were of the age group of 30-34 years with the mean age of 32.1 ± 3.94 years. 24 patients (41.4%), were third gravida with mean gravidity of 3.2 ±0.954. In a study by Kassem GA *et al.,*[11] the mean age group of 32.9 ± 5.06 years and mean parity of 3.7 ±2.52 was found among the patients diagnosed with morbidly adherent placenta. Thus, showing how the incidence of morbidly adherent placenta increases with higher gravidity and older age group of patients. Similar study conducted by Aggarwal R *et al.,*[12] corroborates with the observations made by our study of how increasing age and higher birth order are risk factors associated with development of morbidly adherent placenta.

Majority of the patients ,96.6 % (56), had history of at least one lower segment caesarean section as mode of delivery in past pregnancies. Similar observations were made by Fitzpatrick KE *et al.,*[13] with a previous LSCS rate of 98 % in their patients. This explains how previous pregnancy with scar remains the most important risk factor in the development of morbidly adherent placenta in subsequent pregnancies.

Other most important association observed in our study was that of placenta previa, which was seen in 49 patients (84.5%). The incidence of concomitant placenta previa with morbidly adherent placenta has also been observed in studies by Aggarwal R *et al.,*[12] and Armstrong CA *et al.,*[14] with associations as high as 70% and 88% respectively. In a cohort study conducted by Bailit JL *et al.,* [15] on the treatments and outcomes of women with morbidly adherent placenta 53% were suspected to have morbidly adherent placenta before delivery which is in concordance with our study.

Placenta accreta was diagnosed in 15.5% (9) patients, placenta increta in 27.6% (16) of patients and placenta percreta was diagnosed in 56.9% (33) of patients. Although dedicated ultrasound doppler studies and MRI have improved antenatal diagnosis still between one half to two thirds of cases remain undiagnosed resulting in poorer maternal outcomes as stated by studies of Bailit JL *et al.,*[15]

Majority of the patients (94.8%) had hysterectomy as the main treatment modality. These results were comparable with some other studies such that conducted by Armstrong CA *et al.,*[14] in which 91.0% of the cases underwent hysterectomy, a study by Aggarwal R *et al.,*[12] with 85% patients having hysterectomy as their first line of treatment and 5% requiring internal iliac artery ligation and a study by Al-Khan A *et al.,*[16] showed 83.6% of hysterectomy rate among study patients.

23 (39.7%) patients had bladder injury due to placenta percreta invading the bladder, for which urologist help was sought and 4 (6.8%) of these patients required suprapubic cystostomy prolonging the hospital stay. One of these four cases, suffered from post

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operative wound sepsis which necessitated secondary suturing and prolonged hospital stay. Study conducted by Aggarwal R *et al.,*[12] on outcomes and treatment in morbidly adherent placenta showed similar rates of bladder injuries (20%) in their study patients among which 5% required partial cystectomy and 15% required bladder repair.

30 (51.7%) patients required inotropic support in addition to the massive blood and blood products transfusions due to haemorrhagic shock. 2 patients (3.4%) suffered from DIC, which was managed multiple FFP and platelet transfusions. A total of 3 (5.2%) patients couldn't be salvaged due irreversible shock and sudden cardiopulmonary arrest. Maternal morbidity has been reported to occur in up to 60 % of patients and mortality in up to 7 % of women with morbidly adherent placenta by study conducted by Eller AG *et al.,*[17] which corroborates with our study.

33 patients (56.9%) delivered before 37 completed weeks of period of gestation and 25 patients (43.1%) delivered at and beyond 37 weeks. In our study, the mean gestational age at delivery was 35.8±2.07 weeks. In a retrospective study conducted by Kassem GA *et al.,*[11] on maternal and fetal outcomes of placenta previa and placenta accreta, the mean gestational age at time of delivery was 35.7±2.56 weeks which was comparable with our study.

The mean Apgar score of the neonates born to the study patients was 6.7±1.88 with 33 (56.7%) scaling less than 7/10 on the Apgar scale. Prematurity which was seen in 34 out of 58 neonates (58.6%) and respiratory distress was reported in 31(53.4%) neonates. Similar results were observed in study conducted by Chaudhari HK *et al.,*[18] with 53% of patients delivering preterm. In retrospective study carried by Aggarwal R *et al.,*[12] on fetomaternal outcomes, 55% of newborns born were preterm. There were a total 13.7% (8) of neonatal deaths in our study due to respiratory distress and prematurity.

Optimal management of women with placenta accrete involves early recognition of high-risk women based on clinical risk factors, accurate preoperative diagnosis, detailed maternal counselling and meticulous planning at the time of delivery along with arrangement of adequate units of blood and blood products.

Conclusion

Morbidly adherent placenta is one of the most devastating complications in pregnancy, associated with significant and increased maternal and perinatal mortality and morbidity. Its incidence is increasing due to the rising caesarean section rate and other procedures on the uterus. The maternal and foetal outcome can be further improved by early diagnosis, planned surgery by experienced multidisciplinary team, availability of interventional radiology, ICU , NICU , blood and blood products.

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