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Original Article

Maternal Outcomes in the Management of Morbidly Adherent Placenta: Multidisciplinary Team vs. Standard Care at a Tertiary Care Hospital

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Abstract

Background: Morbidly adherent placenta (MAP) is one of the obstetric emergencies, if not diagnosed and managed properly.
Objective: The objective of the study was to compare maternal outcomes in patients with morbidly adherent placenta managed in a multidisciplinary team setting compared to standard care.
Study type, settings & duration: A comparative cross-sectional study was conducted in obstetrics and gynecology Department, Liaquat University of Medical and Health Sciences for a period of two years from June 2018 to May 2020.
Methodology: A total of 40 patients were enrolled, using convenient sampling technique**.** All patients either booked, un-booked, referral or who came as emergency cases with morbidly adherent placenta (including Accreta, Increta, Percreta) confirmed on TVS, MRI or clinically diagnosed during surgery were included in study. A questionnaire was used to retrieve the required data for statistical analysis. Chi-square test was applied and p-value ≤ 0.05 considered as level of significance.
Results: Twenty study participants (50%) were booked cases and ante-natally diagnosed cases of MAP and 60% of them were admitted in the hospital, most of them were in the age group 20-30 years and all (100%) had history of previous caesarean section. Almost 88% were at or more than 35 weeks of pregnancy. Around 48% Percreta, 27% Accreta and 25% Increta types of MAP were found during surgical procedure. Out of 40 enrolled patients 26 (65%) were managed by multidisciplinary care while 14 (35%) by Standard care. There were less complications (p =0.057) and statistically significant better maternal (p =0.040) and fetal outcomes (p =0.050) were found in multidisciplinary team management as compared to the standard care.
Conclusion: The MAP was common in multiparous women with history of previous cesarean sections. The most common MAP types were Placenta Accreta and Percreta. Antenatal diagnosis of MAP allows multidisciplinary team to plan for expected case management in an attempt to minimize potential maternal or neonatal morbidity and mortality.
Key words: Morbidly adherent placenta, Multidisciplinary team, Placenta accreta, increta, percreta, maternal outcome.

Introduction

Morbidly adherent placenta (MAP) is a serious obstetrical condition induced by aggressive villi implantation in / through the myometrium. The spectrum of this disorder involves placenta accreta, increta, and percreta according to depth of placental villous invasion into the uterine wall that is into the deciduas, into uterine myometrium and up to uterine serosa respectively. In clinical practice, the term placenta accreta is often used for the three types of MAP.[1] Recent research found that elective cesarean hysterectomy with preoperative bilateral ureteric stent placement, and no attempt to remove the placenta, reduces maternal morbidity.[2]

Placenta accreta is a significant cause of postpartum hemorrhage and is not only associated with a 40 percent chance of extreme transfusion, but also with a 6-7 percent maternal mortality rate.[3] Hysterectomy is often done as a life-saving procedure, depending on the severity of the invasion and the type of morbidly adherent placenta. Incidence of MAP was very low until the 1980s; i.e., 1 in 70,000 births.[4]

Recent reports suggest the incidence of MAP varies between 1/210 to 1/2500 births in developed nations.[5] At the same time, the rates published from the countries with low resources are also very high. The incidence of MAP reported in a recent study from Karachi was 1.83/1000 deliveries.[6]

The high incidence of MAP includes many factors such as; recent damage to the defensive uterine decidua due to the cesarean section, myomectomy and frequent uterine curettage.[7] MAP is related with severe maternal morbidity, postpartum hemorrhage, acute tubular necrosis, hysterectomy, bladder and ureteric trauma, acute respiratory distress syndrome and disseminated intravascular coagulation (DIC). Blood loss after attempted placental removal has been reported to be higher than 3000ml in 90 percent of cases, including when conducting hysterectomy, as many as 90 percent of patients need transfusion and 40 percent need > 10 units of packed red blood cells. It results in high rates of maternal morbidity and mortality in a low resource region.[8]

MAP's optimum control is particularly difficult because most of these cases are diagnosed during labor or during cesarean section. A standard MAP care is scheduled pre-decided care of MAP by obstetricians by doing elective cesarean section with in situ placenta, without any attempt for placental delivery. This can reduce maternal morbidity and mortality. Followed by conservative treatment options including methotrexate and if placenta cannot be separated from the uterine wall then cesarean hysterectomy is a second option, which otherwise can lead to severe maternal consequences like hemorrhage, Dilatation and Curettage (D&C), hysterectomy, urinary bladder and ureteric trauma.[9,10]

Obstetric hemorrhage in Pakistan is one of the leading causes of maternal morbidity and mortality during parturition.[11] Usually, pregnant women presents as unbooked, anemic cases to hospital in an emergency. As with most other countries in Pakistan, the incidence of caesarean section, myomectomy & hysterectomy is rising but their long-term threats to mothers are rarely reported. MAP is one such grave complication. Multidisciplinary team approach is relevant in managing these patients in order to reduce morbidity and mortality associated with MAP. Multidisciplinary care as its name indicates is the care provided by a comprehensive team comprises of and is not limited to a number of specialized and experienced persons such as; obstetricians and maternal–fetal medicine subspecialists, pelvic surgeons with expertise in reconstruction surgery, urologists, obstetric anesthesiologists, pediatrician and other such as vascular surgeons/ oncologists to be available in the vicinity to provide the desired care, if needed. Liaquat University of Medical and Health Sciences University Hospital is a well-equipped hospital providing multidisciplinary services under one umbrella. Therefore, the aim of this study was to compare maternal outcomes in patients with morbidly adherent placenta managed in a multidisciplinary team setting compared to standard care in a local setup.

Methodology

The comparative cross-sectional study included all patients with confirmed diagnosis of placenta accreta, increta or percreta and treated at Department of Gynecology Unit III, Liaquat University Hospital, for a period of two years from June 2018 to May 2020.

Non probability purposive sampling technique was used to collect secondary data. The data of patients, whether booked ,un-booked , referral or emergency patients with morbid adherence of placenta (including Accreta, Increta, Percreta) confirmed on TVS, MRI or clinically diagnosed while performing surgery were included in study. The records of admitted patients followed during their hospital stay to measure the outcome i.e. morbidity and mortality. All patients other than MAP and those with incomplete records (due to any reason) were excluded from the study. A questionnaire was used to record, demographic data such as maternal age, gestational age, parity, location, antenatal booking status were recorded. Patients with > 3 antenatal visits were listed as "booked cases". Past history and number of caesarean deliveries was recorded on a predesigned proforma.

Those patients who arrived in the emergency room with no previous diagnosis of MAP followed by an emergency procedure were labeled

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Authors Contribution

FP conceptualized the project. FA, SA & SAM did the data collection. FA, SA, SAM, FNM & RE did the literature search. The statistical analysis was also done by FA, SA, SAM & FNM. FNM & RE did the drafting, revision & writing of manuscript.

as "emergency cases", while those admitted via OPD with suspicion and/or diagnosis of MAP and scheduled procedure were classified as "expected cases". Comparison of the two modes of admission with outcome variables was performed. Information on variables like placental localization, blood loss, and history of blood transfusion, surgical procedure and subsequent management to control hemorrhage were recorded from the patient's medical record. The complications of Intraoperative surgery such as bladder or bowel injuries were also recorded. Assessment of critical care, hospital stay, postoperative complications such as fever, DVT, wound infection, anemia and maternal outcome were recorded as maternal outcomes.

Operative reports clinically defined three categories of MAP, placenta accreta, placenta increta, and placenta percreta. In addition, data was examined for patients who came to the hospital in an emergency situation and those who were admitted but needed emergency surgery for obstetric complications. Neonatal outcomes were recorded too.

The statistical software SPSS (Version 22.0; SPSS Inc, Chicago, IL) was used to analyze the data. Frequencies and percentages were calculated for all categorical variables. Chi square test was performed to evaluate statistical significance of qualitative, independent and outcome variables at p-value ≤ .05 and at 95% confidence interval.

The ethical approval was taken from Research Ethics Committee (REC) of Liaquat University of Health & Medical Sciences (LUMHS), Jamshoro.

Results

A total of 40 patients were included in this study. Type of placental adherence on surgical findings of the patients are shown in Figure, which shows that out of 40 MAP, the highest number (19) were placenta Percreta. The basic demographic variables like mode of admission, educational status, occupation, residential status and socioeconomic status are shown in Table-1. Mostly (60%), booked patients were in the hospital, the most common age group was 20-30 years (48%), and most of the patients were educated house wives from socioeconomically middle class families.

Statistics regarding patients' history is described in Table-2 which shows booking status (50%) each, parity (93% multi-parious), and previous mode of delivery (100% previous caesarean section) and gestational age of the pregnant women (88% were more than 35 weeks) at the time of arrival in the hospital.

The results showed that 26 patients were managed by "multidisciplinary team" while 14 patients were managed by "standard care". A Chi square test was performed to examine the relation between management of the patient (multidisciplinary

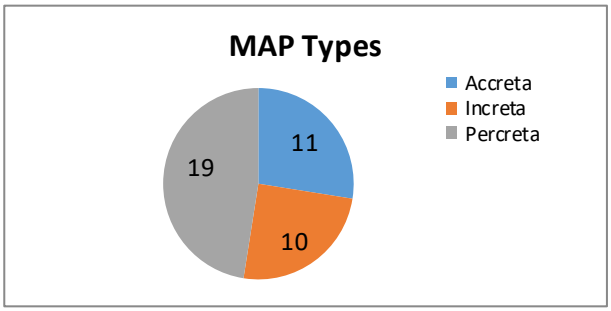

Figure: Types of morbid adherence on surgical findings of the patients. (n=40)

Table 1: Demographic information of the patients. (n=40)

Variables	*Frequency*	*Percentage (%)*
Mode of Admission		
Referred	2	5
Hospital Cases	24	60
Emergency	14	35
Age		
20-30 Years	19	47.5
31-40 Years	17	42.5
40 Years onwards	4	10
Educational status		
Uneducated	16	40
Educated	24	60
Occupation		
House wife	33	82.5
Working women	7	17.5
Residential status		
Urban	17	42.5
Rural	23	57.5
Socioeconomic status		
Poor	15	37.5
Middle class	25	62.5

Table 2: Gynecological history of patients.

Variables	*Frequency*	*Percentage (%)*
Booking status		
Booked	20	50
Unbooked	20	50
Parity		
Nulliparous	3	7.5
Multiparous	37	92.5
Previous mode of delivery		
Caesarean section	40	100
Normal	0	0
Gestational age		
24-30 weeks	2	5
31-35 weeks	3	7.5
More than 35 weeks	35	87.5

team versus standard care) with clinical presentation and outcome of delivery, Table-3a & 3b.

In multidisciplinary team care, patients presented as hemodynamically stable, had mild p/v bleeding (p =.007) and (p =.003) respectively. Highly significant difference was seen when patients were diagnosed (by ultrasound findings) and surgically managed by multidisciplinary team involvement (p =<.001 and p =.038) respectively. More blood transfusions to patients were seen in standard care management (p =.006). Whereas, statistically less complications (p =.057) and better maternal and fetal outcomes were observed in multidisciplinary care (p =.040) and (p =.050) respectively.

Table 3a: Clinical presentation of patient. (n=40)

Variable	*Multidisciplinary Team n =26 Frequency(%)*	*Standard Care n = 14 Frequency(%)*	*p-Value*
Clinical presentation			
Hemodynamically stable	16 (62)	2 (14)	0.007
Hemodynamically Unstable	10 (38)	12 (86)	
Bleeding P/V			
Mild	18 (69)	2 (14)	
Moderate	5 (19)	5 (36)	0.003
Severe	3 (11)	7 (50)	
Sonographic findings			
Type-II	0 (0)	1 (7)	
Type-III	13 (50)	4 (29)	0.204
Type-IV	13 (50)	9 (64)	
Placenta Previa			
Anterior	20 (76)	10 (71)	0.702
Posterior	6 (23)	4 (29)	
Type of Morbid Adherence of Placenta on U/S			
Accreta	16 (62)	1 (7)	
Incretta	5 (19)	1 (7)	< 0.001
Percretta	5 (19)	12 (86)	
Who were involved in multidisciplinary team			
Senior Obstetrician	0 (0)	4 (29)	
Urologist	16 (0)	5 (35.5)	< 0.001
Involved More than 1 specialty	26 (65)	5 (35.5)	
Surgical intervention			
Emergency C/S	0 (0)	3 (22)	
Total abdominal hysterectomy	10 (38)	9 (64)	
Subtotal hysterectomy	2 (8)	0 (0)	
Myometrial resection	8 (31)	1 (7)	0.038
Compression sutures	2 (8)	0 (0)	
Multiple	4 (15)	1 (7)	

Discussion

Our study provides a detailed comparison between multidisciplinary teams versus standard care for maternal outcomes in the management of morbidly adherent placenta. Study results showed better maternal and fetal outcomes in multidisciplinary team as compared to the standard care. The placenta previa anterior was present in 75% of patients and posterior in 25% of patients. Morbidly adherent placenta antenatal diagnosis is highly difficult in the absence of placenta previa. Better maternal results equates to antenatal treatment of morbidly adherent placenta as seen in present study. Imminent challenges in treating patients with morbidly adherent placenta may depend on precise antenatal diagnosis and prompt access to

Table 3b: Clinical Features and Management of Patients. (n=40)

Variable	*Multidisciplinary team (n = 26)*	*Standard care (n = 14)*	*P-value*
Type of Morbid adherence on surgical findings			
Accreta	11 (42)	0 (0)	< 0.001
Increta	8 (31)	2 (14)	
Percreta	7 (27)	12 (86)	
Units of blood transfused			
1-3	18 (69)	3 (21.5)	.006
4-6	5 (19)	7 (50)	
7-10	3 (12)	1 (7)	
more than 10	0 (0)	3 (21.5)	
Units of platelets transfused			
1-2	5 (19)	4 (29)	0.092
more than 2	0 (0)	2 (14)	
None	21 (81)	8 (57)	
Complications			
Bladder injury	4 (15)	1 (7)	0.057
Bowl injury	0 (0)	1(7)	
Excessive blood loss	2 (8)	2(14)	
Massive transfusion	2(8)	0 (0)	
More than 1 complication	7 (27)	9 (65)	
None	11(42)	1(7)	
Maternal outcome			
Satisfactory	20 (77)	5 (36)	
Having some single /multiple complication	6(23)	9(64)	
Description of single /multiple complication observed in number of patients			
Renal Failure	4	9	0.040
Multi organ failure	0	3	
Massive blood transfusion	6	4	
Transfusion reaction	0	1	
DIC	0	6	
ICU admission	6	7	
Prolong hospital stay	5	5	
Maternal mortality	0	3	
Fetal outcome			
Alive	21 (81)	6 (43)	0.050
IUD	0 (0)	1 (7)	
Stillborn	3 (11)	5 (36)	
Premature	0 (0)	1 (7)	
Multiple	2 (8)	1 (7)	

a multidisciplinary care protocol institution. Rationally, increased knowledge, experience, and skills relevant to the treatment of patients with morbidly adherent placenta may lead to better results in a multidisciplinary setting. This will include the modification of antenatal risk factors such as anemia, accessibility of cross-matched blood, successful fetal protection measures such as administration of neonatal corticosteroids or magnesium sulphate, if any, and the progress of a robust elective and emergency delivery plan. Using a multidisciplinary team approach led to higher elective delivery rates, enabling perioperative protocols to be followed and all appropriate employees to be available, resulting in improved blood loss and mortality from emergency delivery.[12,13]

A study conducted by Bartels et al.[14] reported that in the multidisciplinary team group, the expected blood loss was greatly reduced and these patients had lower transfusion requirements. Those handled in a standard care environment were more likely to experience complications, but there was no difference between the two groups in length of stay. Similarly, according to Podwika et al.[15] there was no difference in mean maternal age, gravity, parity, or number of prior caesareans between classes. Postoperative duration of stay, 30-day readmission, 5-minute Apgar <7, or birth weight were not distinguished. A significant difference was found in the estimated blood loss and the mean number of transfused units of packed red blood cells.

In contrast to a standard care approach, the present study provided a comprehensive analysis of maternal morbidity and morbidly adherent placenta-associated mortality when a multidisciplinary team approach is needed. Our data suggest that within a multidisciplinary team, the average expected blood loss, the average number of RBC units and the rate of use of a complex transfusion technique will shift over time as mutual awareness of standardized procedures increases and individual interactions with a team role increase. This means that a dedicated multidisciplinary team is an essential component of an optimal framework for handling these types of complications that are anticipated. Our findings are consistent with those of Bowman et al,[16] and Alchalabi et al[17] that there is an increased need for transfusion and ICU admission, as well as operating morbidities such as adjacent organ damage and postoperative bleeding, taking into account the adverse effects of MAP.

The improved performance may have resulted from many factors in the multidisciplinary team group. To decrease the probability of more serious gestational antepartum hemorrhage, regular preterm delivery is also often considered part of the multidisciplinary team care method. This is reflected in the lower gestational age during delivery in the multidisciplinary upper uterine segment incision team cohort. In fact, before progressing to hysterectomy, slightly fewer attempts at manual placental disruption were made in the multidisciplinary team cohort. Attempts to remove the placenta in cases of morbid adherence are associated with increased maternal morbidity and thus a enabling the delivery of the fetus without damaging the placenta followed by en bloc hysterectomy with in situ placenta in a multidisciplinary team setting is likely to lead to improved maternal outcomes.[18] If MAP is diagnosed during the antenatal phase and is handled by a comprehensive multidisciplinary team, then with regards to the outcome of pregnancy our study results are in line with the research performed in various regions.[17] The Like studies done elsewhere our study results also shows that MAP mostly occurs in multi gravid after caesarean sections and has placenta previa.[18]

To better understand the effects and consequences of the disease when establishing a systematic approach, future collaborative research needs to be carried out by centers with multidisciplinary management procedures for the MAP. In order to understand and handle the in-depth dynamics of MAP, we suggest that prospective study and randomized control trials with larger samples should be conducted in future. Our data concludes that within a multidisciplinary team, the average expected blood loss, the average number of RBC units and the rate of use of a complex transfusion technique will shift over time as mutual familiarity with standardized procedures increases and individual interactions with a team role increase.

Morbidly adherent placenta is most common in multiparous women with history previous cesarean sections. The most common types of MAP are Placenta Accreta and Percreta. Antenatal diagnosis and expected case management by multidisciplinary teams can reduce maternal morbidity and mortality as compared to the intrapartum diagnosis and emergency management.

Early diagnosis of MAP by taking a detailed obstetric history especially from multiparous women (with history previous of C-sections), detailed sonography of placenta during the antenatal period is essential for managing all pregnant women. This implies that a committed multidisciplinary team is an important component of an ideal system to manage such types of anticipated complications.

Conflict of interest: None declared.

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