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Original Research Article

Risk Factor Associated with PAS Disorder and Observation its Management Modalities and Fetomaternal Outcome

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Abstract: *Background:* Diseases of the placenta accreta spectrum (PAS) have become recognized as a serious and potentially fatal condition due to their increasing prevalence, morbidity, and mortality. Determining the risk factors for PAS illnesses has been the subject of extensive investigation. Choosing the best management strategy for PAS diseases requires thought. *Objective:* The aim of this study is to assess the risk factor associated with PAS disorder and observation its management modalities and fetomaternal outcome. *Methods:* The cross-sectional observatinal study was conducted in the Department of Obstetrics & Gynaecology, Dhaka Medical College Hospital, Dhaka from18[th] January 2020 to 17th July 2020. This study comprised 84 people who had been diagnosed with PAS condition. Patients were divided into three groups based on the management strategy that was employed: Group B (n = 40) had a cesarean section (CS) with cervical inversion and ligation of both uterine arteries; group C (n = 16) had a cesarean hysterectomy with the placenta left in place. The questionnaire was pretested, corrected and finalized. Data were collected by face-to-face interview and analyzed by appropriate computer based programmed software Statistical Package for the Social Sciences (SPSS), version 24. *Results:* In this study, mean ± SD of age was calculated 32.1 ± 3.3 years for Group – A, 31.7 ± 2.2 years for Group – B and 31.4 ± 1.4 years for Group – C (p-value = 0.415) which explains that there was no significant statistical difference between the groups was observed. About 16 (57.1%), 18 (64.3%) and 3 (18.8%) of them had a parity ≥ 3 in Group-A, Group-B and Group-C respectively. 17 (60.7%) in Group-A and 15 (37.7%) in Group-B of them had ≥2 previous CSs. 9 (31.1%), 11 (27.5%) and 5 (31.3%) of them had previous history of placenta previa in Group-A, Group-B and Group-C respectively. About 8 (25.0%) patients in group-A, 12 (28.6%) in group-B and 6 (55.0%) in group-C had the history of previous D & C. About 6 (42.9%) patients in group-A, 9 (21.4%) in group-B and 4 (25.0%) in group-C had the history of previous MR. Estimated blood loss (EBL) and blood transfusion in group-A 2.64 ± 1.12 and 3.6 ± 1.2 were significantly higher than other groups. Duration of hospital stay in Group-A 13 (46.4%), in Group-B 6 (15.0%) and in Group-C was > 7 days. Bladder injury, PPH, Re-exploration and ICU admission were the significant maternal outcome in Group-B patients, reported 3 (7.5%), 4 (10.0%), 0% and 2 (5.0%) of women and in less complication in Group A reported 3 (10.7%), 0%, 1 (3.6%) and 6 (21.4%) and Group C reported 1 (6.25%), 2 (12.5%), 0% and 1 (6.25%). Poor outcomes were significantly higher in group-C. NICU admission for prematurity was required in 6 (21.4%) of the babies in group-A, 8 (20.0%) babies of group-B and 4(25.0%) babies of group-C. Birth asphyxia was observed in 6 (21.4%) of the babies in group-A, 3 (7.5%) in Group-B and 3(18.8%) in Group-C. *Conclusion:* Prenatal diagnosis and placenta preservation may be linked to lower rates of morbidity in mothers. For morbidly adherent placenta linked with placenta previa, we advise hysterectomy as the preferred course of therapy following extremely thorough prenatal counseling. Maternal problems and fetal outcomes may be improved by early risk factor identification and proactive management.

Keywords: Risk Factor, Management Modalities, PAS Disorder, Fetomaternal Outcome.

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INTRODUCTION

Placenta accreta spectrum (PAS) illnesses are a dangerous and potentially fatal obstetric syndrome; in the past 30 years, their incidence has climbed from 0.12 to 0.31%. A reported death rate of approximately 7.0% further underscores this fact [1]. It is also linked to a significant amount of maternal morbidity, including large blood transfusions, damage to the urinary tract, hysterectomy, ICU hospitalization, sepsis, and prolonged hospital stays [2]. Different degrees of placenta adhesion and invasion of the uterus and/or surrounding organs, such as placenta accreta, increta, and percreta [3], are referred to as PAS. These conditions obstruct placental separation at delivery and can result in severe maternal hemorrhage that puts the lives of the mother and the infant in jeopardy [4].

Numerous recent studies that have looked into risk factors for PAS disorders have identified a high correlation between the development of PAS diseases and placenta previa and maternal age ($\geq$ 35 years) [5]. Zhang *et al.,* (2017) similarly identified parity as a risk factor [1], although the number of past CSs and advanced maternal age were also independent risk factors for PAS issues [6].

Regarding the optimal course of treatment for PAS illnesses, opinions differ [7]. The American College of Obstetricians and Gynecologists (ACOG) states that the placenta should be in place during an elective CS hysterectomy because removing it can cause a large amount of blood loss [8]. People who wish to keep their fertility may reject this option in some circumstances. In these situations, cautious management should be considered after getting the proper risk counseling [7].

All procedures meant to preserve the uterus are part of the conservative treatment for PAS issues. It includes the Triple-P procedure, leaving the placenta in place as part of the expectant care strategy, removing the placenta piecemeal (also known as the extirpative approach), and many more conservative surgical techniques. These methods have been used alone or in combination to reduce the bleeding associated with PAS issues [3].

The aim of expectant care is to reduce severe maternal morbidity during CS for PAS illnesses [9–12]. Forceful placenta extraction [13] increases the risk of hemorrhage, coagulopathy, severe bleeding, and damage to surrounding organs [9–12].

METHODOLOGY

The cross-sectional comparative study was conducted in the Department of Obstetrics & Gynaecology, Dhaka Medical College Hospital, Dhaka from 18th January 2020 to 17th July 2020. This study comprised 84 people who had been diagnosed with PAS condition. Patients were divided into three groups based on the management strategy that was employed: Group B (n = 40) had a cesarean section (CS) with cervical inversion and ligation of both uterine arteries; group C (n = 16) had a cesarean hysterectomy with the placenta left in place. Patients who were not willing to give consent were excluded. Purposive sampling was done according to the availability of the patients who fulfilled the selection criteria. Face to face interview was done to collect data with a semi-structured questionnaire. After collection, the data were checked and cleaned, followed by editing, compiling, coding, and categorizing according to the objectives and variables to detect errors and to maintain consistency, relevancy and quality control. Statistical evaluation of the results used to be obtained via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS-24).

RESULT

Table I: Distribution of the patients according to baseline characteristics (n = 84)

Age (years)	Group-A (n=28)	Group-B (n=40)	Group-C (n=16)	p-value
20 - 25	6 (21.4)	10 (25.0)	4 (25.0)	0.415
26 - 30	7 (25.0)	8 (20.0)	2 (7.1)	
31 - 35	12 (42.9)	16 (40.0)	7 (43.8)	
$\geq$35	3 (10.7)	6 (15.0)	3 (18.8)	
Mean ± SD	**32.1 ± 3.3**	**31.7 ± 2.2**	**31.4 ± 1.4**	
Parity				
1–2	2 (7.1)	22 (55.0)	13 (81.3)	< 0.001
3–4	16 (57.1)	18 (64.3)	3 (18.8)	
$\geq$ 5	10 (35.7)	0	0	
Previous CS				
1	0	9 (22.5)	9 (56.3)	< 0.001
2	2 (7.1)	14 (35.0)	7 (43.8)	
3	17 (60.7)	15 (37.7)	0	
4	9 (32.1)	2 (5.0)	0	
History of placenta previa				
Yes	9 (31.1)	11 (27.5)	5 (31.3)	0.035
No	19 (67.9)	29 (72.5)	11 (68.8)	

Table I shows that, mean ± SD of age was calculated 32.1 ± 3.3 years for Group – A, 31.7 ± 2.2 years for Group – B and 31.4 ± 1.4 years for Group – C (p-value = 0.415) which explains that there was no significant statistical difference between the groups was observed. About 16 (57.1%), 18 (64.3%) and 3 (18.8%) of them had a parity ≥ 3 in Group-A, Group-B and Group-C respectively. 17 (60.7%) in Group-A and 15 (37.7%) in Group-B of them had ≥2 previous CSs. 9 (31.1%), 11 (27.5%) and 5 (31.3%) of them had previous history of placenta previa in Group-A, Group-B and Group-C respectively.

Table II: Distribution of the patients according to evaluation of risk factors (n = 84)

Risk factors	Group-A (n=28)	Group-B (n=40)	Group-C (n=16)	p-value
Manual removal of placenta in previous SVD	3 (10.7)	4 (11.9)	2 (20.0)	0.582
Previous D & C	8 (25.0)	12 (28.6)	6 (55.0)	0.241
Previous MR	6 (42.9)	9 (21.4)	4 (25.0)	0.358
Short interval of pregnancy from previous C/S (<2 yr)	3 (10.7)	8 (19.0)	3(20.0)	0.891
GDM	1 (3.6)	2 (4.8)	0	0.323
DM	1 (3.6)	1 (2.4)	0	0.323
Chronic HTN	1 (3.6)	2 (4.8)	0	0.223
PE	1 (3.6)	1 (2.4)	1 (5.0)	0.603

Table II shows that, 8 (25.0%) patients in group-A, 12 (28.6%) in group-B and 6 (55.0%) in group-C had the history of previous D & C. About 6 (42.9%) patients in group-A, 9 (21.4%) in group-B and 4 (25.0%) in group-C had the history of previous MR.

Table III: Distribution of the patients according to clinical, laboratory findings (n = 84)

Variable	Group-A (n=28)	Group-B (n=40)	Group-C (n=16)	p-value
Pre op. Hb (g/dl)	10.3 ± 0.3	9.4 ± 0.7	10.4 ± 0.4	0.665
Post op. Hb (g/dl)	8.5 ± 0.4	9.2 ± 0.5	11.7 ± 0.5	0.047
Estimated blood loss (L)	2.64 ± 1.12	2.34 ± 1.03	2.10 ± 0.58	0.048
Blood transfusion (units)	3.6 ± 1.2	3.3 ± 1.1	2.7 ± 0.6	0.018

Table III shows that, estimated blood loss (EBL) and blood transfusion in group-A 2.64 ± 1.12 and 3.6 ± 1.2 were significantly higher than other groups

Table IV: Distribution of the patients according to duration of hospital stay (n = 84)

Hospital stay (day)	Group-A (n=28)	Group-B (n=40)	Group-C (n=16)	p-value
2	2 (7.1)	4 (10.0)	0	< 0.00
3 - 5	3 (10.7)	26 (65.0)	0	
6 - 7	10 (35.7)	4 (10.0)	7 (43.8)	
> 7	13 (46.4)	6 (15.0)	9 (56.3)	
Mean ± SD	6.8 ± 1.8	5.1 ± 1.8	8.4 ± 1.4	

Table IV shows that, duration of hospital stay in Group-A 13 (46.4%), in Group-B 6 (15.0%) and in Group-C was > 7 days

Table V: Distribution of the patients according to maternal outcome (n = 84)

Maternal outcome	Group-A (n=28)	Group-B (n=40)	Group-C (n=16)	p-value
Bladder injury	3 (10.7)	3 (7.5)	1 (6.25)	
Primary PPH	0	4 (10.0)	0	
Secondary PPH	0	0	2 (12.5)	
ICU admission	6 (21.4)	2 (5.0)	1 (6.25)	
Infection	0	0	3 (18.8)	
Delayed hysterctomy	0	0	2 (12.5)	
Re-exploration	1 (3.6)	0	0	
Mortality	0	0	0	0

Table V shows that, Bladder injury, PPH, Re-exploration and ICU admission were the significant maternal outcome in Group-B patients, reported 3 (7.5%), 4 (10.0%), 0% and 2 (5.0%) of women and in less complication in Group A reported 3 (10.7%), 0%, 1 (3.6%) and 6 (21.4%) and Group C reported 1 (6.25%), 2 (12.5%), 0% and 1 (6.25%)

Table VI: Distribution of the patients according to neonatal outcome (n = 84)

Neonatal outcome	Group-A (n=28)	Group-B (n=40)	Group-C (n=16)	p-value
NICU admission for prematurity	6 (21.4)	8 (20.0)	4(25.0)	0.003
Birth asphyxia	6 (21.4)	3 (7.5)	3(18.8)	0.027
IUGR	5 (17.9)	2 (5.0)	1(6.3)	0.062
Neonatal death	1 (3.6)	1(2.5)	0	0.001
No complication	16 (57.1)	28(70.0)	3(18.8)	0.004

Table VI shows that, poor outcomes were significantly higher in group-C. NICU admission for prematurity was required in 6 (21.4%) of the babies in group-A, 8 (20.0%) babies of group-B and 4(25.0%) babies of group-C. Birth asphyxia was observed in 6 (21.4%) of the babies in group-A, 3 (7.5%) in Group-B and 3(18.8%) in Group-C

DISCUSSION

Obstetricians face a significant difficulty in dealing with maternal and fetal morbidity and death resulting from PAS diseases. From January 18, 2020, to July 17, 2020, a cross-sectional observational study was carried out at the Dhaka Medical College Hospital's Department of Obstetrics and Gynecology in Dhaka. This study comprised 84 people who had been diagnosed with PAS condition.

In this study, mean ± SD of age was calculated 32.1 ± 3.3 years for Group – A, 31.7 ± 2.2 years for Group – B and 31.4 ± 1.4 years for Group – C (p-value = 0.415) which explains that there was no significant statistical difference between the groups was observed. About 16 (57.1%), 18 (64.3%) and 3 (18.8%) of them had a parity ≥ 3 in Group-A, Group-B and Group-C respectively. 17 (60.7%) in Group-A and 15 (37.7%) in Group-B of them had ≥2 previous CSs. 9 (31.1%), 11 (27.5%) and 5 (31.3%) of them had previous history of placenta previa in Group-A, Group-B and Group-C respectively. These findings were in line with the findings of numerous other authors. Fitzpatrick *et al.,* investigated the risk variables for PAS problems and concluded that placenta previa, high maternal age, and previous cesarean delivery were important risk factors [14]. Furthermore, a 2017 study found that placenta previa, high parity, older maternal age, and previous cesarean sections were independent risk factors for PAS abnormalities [15]. Moreover, comparable findings were observed by other researchers [1, 16].

About 8 (25.0%) patients in group-A, 12 (28.6%) in group-B and 6 (55.0%) in group-C had the history of previous D & C. About 6 (42.9%) patients in group-A, 9 (21.4%) in group-B and 4 (25.0%) in group-C had the history of previous MR. Group A experienced a substantially higher estimated blood loss (EBL) of 2.64 ± 1.12 and a blood transfusion rate of 3.6 ± 1.2 compared to the other groups. This conclusion was corroborated by two recent studies published in 2018: one found that approximately 75.0% of cases with PAS disorders required blood transfusions, while the other revealed that 94.7% of individuals with PAS disorders received blood transfusions [17, 18]. Therefore, in these situations, blood transfusions should be expected; additionally, some instances might require large transfusions. In a different study, groups A and B (conservative management) had substantially higher estimated blood loss and blood transfusion. Given that the majority of cases managed by this modality involved diffuse placenta accreta or placenta previa totalis percreta with massive hemorrhage, necessitating cesarean hysterectomy, the results of increased bleeding and increased need for blood transfusion in group A in their study may be explained by the nature of the cases themselves. Furthermore, it is possible for the placental tissues to inadvertently be disrupted during surgery; however, our protocol called for a cesarean hysterectomy with the placenta preserved, if possible. Additionally, bleeding from varicosities in the vesico-uterine pouch and on the bladder's surface is linked to downward displacement of the bladder in the group that underwent cesarean hysterectomy. This conclusion is backed by other research in the literature [19–23]. The primary disadvantage of cesarean hysterectomy performed for PAS diseases is significant blood loss [19]. According to Wright *et al.,* (2011), patients with PAS disorders undergoing cesarean hysterectomy lost an average of 3000 milliliters of blood, while they needed an average of 5 packed red blood cell (PRBC) units for transfusion. Of the women with a confirmed diagnosis of PAS diseases, about 41.7% had an estimated blood loss of ≥5000 mL [20]. Additionally, our findings concur with those of Epstein *et al.,* who studied 77 women with PAS disorders. When comparing the hysterectomy group to the conservative care group, there was a statistically significant increase in EBL (2989 ml vs. 1410 ml) [21].

Their findings concur with earlier research in the literature that found fewer instances requiring blood transfusions under conservative care as opposed to extrinsic management [9, 22, 23]. Blood transfusions,

DIC, hysterectomies, and sepsis were lower during the second phase of conservative management compared to extirpative therapy, according to a retrospective research comparing expectant management to extirpative management in two successive periods [24].

Duration of hospital stay in Group-A 13 (46.4%), in Group-B 6 (15.0%) and in Group-C was > 7 days. Bladder injury, PPH, Re-exploration and ICU admission were the significant maternal outcome in Group-B patients, reported 3 (7.5%), 4 (10.0%), 0% and 2 (5.0%) of women and in less complication in Group A reported 3 (10.7%), 0%, 1 (3.6%) and 6 (21.4%) and Group C reported 1 (6.25%), 2 (12.5%), 0% and 1 (6.25%). Poor outcomes were significantly higher in group-C. NICU admission for prematurity was required in 6 (21.4%) of the babies in group-A, 8 (20.0%) babies of group-B and 4(25.0%) babies of group-C. Birth asphyxia was observed in 6 (21.4%) of the babies in group-A, 3 (7.5%) in Group-B and 3(18.8%) in Group-C. Large-scale French multicenter retrospective study was conducted to assess the effectiveness of expectant care of PAS problems. In our study, the uterus was maintained in 78% of cases as opposed to 87.5% in group C. Overall, these findings point to the convenience of conservative management in situations where additional conception is desired with consent for follow-up [10]. In addition to a conservative strategy, other procedures such pelvic devascularization (permanent or temporary) and embolization have been utilized to accelerate placental absorption. Additionally, according to some writers [25, 26], these measures stop subsequent postpartum hemorrhage from happening. Ten of the sixteen patients in group C of our study had uterine artery embolization (UAE) after the placenta was left in situ. In line with past research, they also found that UAE aided in accelerating placental resorption and reducing placental vascularity [25, 26]. Numerous investigations, which found that bladder and ureteric injuries are the most common ailments reported following cesarean hysterectomy, confirmed our findings [27–30]. Their findings showed that the CS hysterectomy group's average length of hospital stay was 6.8 days. It has been reported that the mean hospital stay following CS hysterectomy ranged from 4 to 8 days, which is consistent with our findings [31].

CONCLUSION

Prenatal diagnosis and placenta preservation may be linked to lower rates of morbidity in mothers. We found a low rate of effective uterine preservation, a low rate of maternal complications, and a generally favorable fetal outcome in our analysis. For morbidly adherent placenta linked with placenta previa, we advise hysterectomy as the preferred course of therapy following extremely thorough prenatal counseling. Women who have a strong desire to become pregnant and those whose condition is too advanced for a primary hysterectomy to be performed safely should be treated conservatively. Strategic management and early risk factor identification may enhance the results for both the mother and the fetus.

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