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Dr Vandana Rani
Associate Prof, Obstetrics and Gynaecology Department, Pt B.D.S PGIMS, Rohtak, Haryana, India

Dr. Shaveta Jain
Associate Prof, Obstetrics and Gynaecology Department, Pt B.D.S PGIMS, Rohtak, Haryana, India

Dr. Smiti Nanda
Sr Prof & Head, Obstetrics and Gynaecology Department, Pt B.D.S PGIMS, Rohtak, Haryana, India

Dr. Vani Malhotra
Prof, Obstetrics and Gynaecology Department, Pt B.D.S PGIMS, Rohtak, Haryana, India

Dr. Meenakshi B Chauhan
Prof, Obstetrics and Gynaecology Department, Pt B.D.S PGIMS, Rohtak, Haryana, India

Dr. Neetu Sangwan
Prof, Obstetrics and Gynaecology Department, Pt B.D.S PGIMS, Rohtak, Haryana, India

Correspondence
Dr Vandana Rani
Associate Prof, Obstetrics and Gynaecology Department, Pt B.D.S PGIMS, Rohtak, Haryana, India

Placenta accrete spectrum-management and fetomaternal outcome at a tertiary care centre

Dr Vandana Rani, Dr. Shaveta Jain, Dr. Smiti Nanda, Dr. Vani Malhotra Dr. Meenakshi B Chauhanand and Dr. Neetu Sangwan

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Abstract
Objectives: The aim of this study was to evaluate the demographic profile, risk factors, management strategies in women with placenta accrete spectrum and also to see the feto-maternal outcome of these women.
Study design- Prospective Analysis
Methods: This study was conducted in the Department of Obstetrics and Gynaecology, PGIMS, Rohtak, Haryana from January 2017 to December 2018. All the women who were diagnosed as placenta accrete spectrum (PAS) either on ultrasonography, magnetic resonance imaging or intra-operatively were included in the study.
Results: During the two year study period, there were 22745 deliveries, out of which 22 patients were diagnosed to have placenta accrete spectrum, therefore, the incidence was 0.09%. The majority (41%) of the women in study belonged to the age group of 30-35 years. Most of the women (77%) were unbooked and 80% were from rural background. None of the women in our study were primiparous. The risk factors for PAS in our study included history of one caesarean section in 11(50%) patients, two caesarean section in 4 (18%) patients and history of three caesarean section in 2 (9%) patients. Co-existing placenta previa was present in 17 (77%) of the women with placenta accrete spectrum. Eight women (36%) had placenta accrete, one (5%) had placenta increta and rest of the 59% were diagnosed as placenta percreta. The maternal complications encountered in the study were post-partum haemorrhage (95%), bladder injury (59%), DIC (9%) and sepsis (5%). Maternal mortality rate was 9%. The most common neonatal complication was prematurity and low birth weight.
Conclusion: The rising rates of caesarean sections is an important factor behind increase in incidence of placenta accrete spectrum. Early diagnosis in antenatal period, timely intervention, multi-disciplinary team approach and adequate arrangement of blood and blood products is a key for successful management of PAS, thereby, reducing maternal and neonatal morbidity and mortality.

Keywords: Placenta accrete, spectrum-management, fetomaternal outcome, tertiary care centre

Introduction

Obstetric haemorrhage is one of the leading causes of maternal morbidity and mortality especially in the developing countries. Placenta accrete spectrum (PAS) is a life threatening condition, which is, now, becoming an emerging cause of obstetric haemorrhage. It is the most frequent indication of peripartum hysterectomy [1, 2].

Placenta accrete spectrum, formerly called as morbid adherent placenta, collectively includes placenta accreta, placenta increta and placenta percreta. Placenta accreta is the condition where placenta is attached or adherent to the uterine wall. In placenta increta, placenta is invading into the myometrium whereas placenta percreta describes invasion through the myometrium and serosa and occasionally, into the adjacent organs such as bladder. Globally, there is increase in incidence of PAS and this increase is directly contributed by the rising rates of caesarean sections worldwide. Rise in prevalence has been shown from observational studies in 1970s and 1980s from 1 in 2510 and 1 in 4017 to 1 in 533 from 1982-2002 [3-6]. Overall rates of placenta accrete in the United States was found to be dramatically increased to 1 in 272 [6].

The aim of this study was to evaluate the demographic profile, risk factors, management options and feto-maternal outcome in women with Placenta accrete spectrum at a tertiary care centre.

Material and Methods

This was a prospective study conducted in the Department of Obstetrics and Gynaecology, at a tertiary care referral centre, PGIMS, Rohtak, and Haryana from 1st January 2017 to 31st December 2018.

All the women who were diagnosed as placenta accrete spectrum either on ultrasonography, magnetic resonance imaging or intra-operatively were included in the study. Demographic data including age, parity, socioeconomic status, obstetric history including previous history of caesarean section or dilatation and curettage, gestational age at delivery and any intra-operative or post- operative events were recorded. A note was also made about current pregnancy investigations and outcomes like exact placental localisation, mode of delivery, estimated blood loss, number of blood transfusions, procedures required to control bleeding, intra-operative or post-operative complications, transfer to intensive care unit and duration of hospital stay. Neonatal outcomes were reviewed for birth weight, neonatal intensive care unit admissions and perinatal mortality.

Results

During the two year study period, there were 22745 deliveries, out of which 22 patients were diagnosed to have placenta accrete spectrum. This gives an incidence of 0.09% (1 per 1034 deliveries) at our institute.

The demographic characteristics of the women with PAS are summarised in Table 1. The majority (41%) of the women in study belonged to the age group of 30-35 years and two women were more than 35 years of age. The mean age of the women was 29.7 years. 18 (82%) women belonged to lower socioeconomic class. Most of the women (77%) were not registered at our institute and 80% were from rural background. None of the women in our study were primiparous. Out of the 22 women diagnosed as PAS, eight women (36%) had placenta accreta, one (5%) had placenta increta and rest of the 59% were diagnosed as placenta percreta. Antenatal diagnosis of PAS could be made only in three (14%) patients. All these three had suspicious findings for placenta percreta on colour doppler ultrasonography and MRI was also done to confirm the diagnosis. 16 (72%) patients were diagnosed during intra-operative period and three (14%) were diagnosed in the post-partum period with the presenting feature of retained placenta. Out of these three patients, one had a preterm vaginal delivery of a macerated foetus at 34 weeks and then, had a retained placenta. Placenta was densely adherent and manual removal of placenta could not be done, so a provisional diagnosis of placenta accreta was made which was confirmed on USG and MRI. Patient was kept on expectant management but she developed sepsis on eighteenth post-natal day. Laparotomy followed by hysterectomy was done and patient had a successful outcome after hysterectomy. The other two patients had retained placenta after induced abortions at 17 and 22 weeks.

Table 1: Sociodemographic profile

Type of Placentation	Number (n=22)	Percentage (%)
Placenta accreta	8	36
Placenta increta	1	5
Placenta percreta	13	59
AGE (years)		
≤ 24	3	14
25-29	8	36
30-35	9	41
>35	2	9
Socioeconomic status		
Upper class	0	0
Upper middle	0	0
Lower middle	4	18
Upper lower	8	36
Lower class	10	46
Parity		
P1	8	36
P2	5	23
P3	7	32
P4 or more	2	9
Registration status		
Booked	5	23
Unbooked	17	77
Timing of diagnosis		
Antenatal	3	14
Intra-operative	16	72
Postpartum	3	14

The risk factors for PAS in our study included history of one caesarean section in 11(50%) patients, two caesarean section in 4 (18%) patients and history of three caesarean section in 2 (9%) patients. Three (14%) women had placenta previa alone while co-existing placenta previa with caesarean section was present in 17 (77%) of the women with placenta accrete spectrum. There was history of dilatation and curettage in 6 (27%) women. Forty five percent of the women delivered between 35 and 38 weeks while 32% delivered between 30 to 34 weeks of gestation. There were 23% of the women who presented and delivered at period of gestation less than 30 weeks of gestation. Only three women were taken up for elective surgery, rest all others were operated on an emergency basis due to antepartum or postpartum haemorrhage. Classical caesarean section was done in 23% while lower segment caesarean section was done in 63% of the women with PAS (Table 2).

Table 2: Risk Factors, Timing and Route of Delivery

Risk Factor	Number	Percentage (%)
History of caesarean section (C.S)	17	77
Previous one C.S	11	50
Previous two C.S	4	18
Previous three C.S	2	9
Placenta previa	3	14
Placenta previa with previous C.S	17	77
Curettage	6	27
POG at time of delivery		
<30 weeks	5	23
30-34 weeks	7	32
35-38 weeks	10	45
Timing of surgery		
Elective	3	14
Emergency	19	86
Route of delivery		
Lower segment C.S	14	63
Classical	5	23
Vaginal delivery	1	5
Abortion	2	9

Out of twenty two women with PAS, 95% women had postpartum haemorrhage (PPH). Total hysterectomy was done in 86% (18) of the women who had PPH. Sixteen women had emergency caesarean hysterectomy. One patient was referred after lower segment caesarean section (LSCS) and hysterectomy was done after an interval of 12 hours of LSCS and in one patient, hysterectomy was done after eighteenth postnatal day of a preterm vaginal delivery due to ongoing sepsis in view of conservatively managed placenta accreta. PPH was managed by combination of bilateral uterine artery ligation and balloon tamponade in 9% of the patients whereas balloon tamponade alone was successful in 5% of the patients with placenta accreta with PPH (Figure 2). The average blood loss was around 2-2.5 litres. An average of six units of packed cell RBC's (Range 3-8) and eight units of fresh frozen plasma (FFP) (range 2-10) were transfused in women with massive blood loss in our study.

The other complications encountered in our study are mentioned in Figure 1. Bladder repair was done in 59% (13) patients, 9% (2) were diagnosed to have disseminated intravascular coagulation (DIC) and 5% (1) had sepsis. The number of women to be shifted to intensive care unit (ICU) was 11 (50%) and the average duration of stay at ICU varied from two to five days. Out of 11 women shifted to ICU, two had expired and rest were discharged in stable condition (Table 3).

Table 3: Details of ICU admissions in our study

Sr No.	POG at delivery (wks)	Pre-op Hb (gm%)	El/ Em.	Surgery	Blood loss (ltr)	complication	No. of blood units transfused	ICU stay	outcome
1	36	3	Em.	LSCS f/b Caesarean hysterectomy	2.7	PPH	5 PCV 5 FFP	3 hrs	expired
2	22	5	Em.	MRP f/b Hysterotomy	2.5	PPH DIC	6 PCV 6 FFP	2 hrs	expired
3	26	7	Em.	Classical C.S f/b hysterectomy with bladder repair	2	PPH	5 PCV 5 FFP 8 FWB	5 D	stable
4	38 Lscs done outside	5	Em.	laparotomy f/b hysterectomy with bladder repair	2.5	PPH DIC	8 PCV 9 FFP 3 PRP 3 CRYO	6 D	stable
5	37	10	El.	Classical C.S f/b hysterectomy with bladder repair	2	PPH	5 PCV 5 FFP 2 PRP 2 CRYO	3 D	Stable
6	35	9	Em.	LSCS f/b hysterectomy with bladder repair	1.5	PPH	5 PCV 5 FFP	2 D	Stable
7	30	8	Em.	LSC.S f/b hysterectomy with partial cystectomy	1.5	PPH	5 PCV 5 FFP	3 D	Stable
8	34 PTVD	10	El.	laparotomy f/b hysterectomy with bladder repair	1	SEPSIS	3 PCV 3 FFP	20 D	Stable
9	36	11	El.	Classical C.S f/b hysterectomy with bladder repair	2	PPH	2 PCV 2 FFP	3D	Stable
10	34	7	Em.	LSCS with balloon tamponade	1.5	PPH	5 PCV 5 FFP	2D	Stable
11	36	9	Em.	C.S f/b hysterectomy with bladder repair	1.5	PPH	4 PCV 10 FFP	5D	stable

Abbreviations : POG- period of gestation; El. – Elective; Em.-emergency; LSCS-lower segment caesarean section; PPH-post-partum haemorrhage; MRP- manual removal of placenta; DIC- disseminated intravascular coagulation; PCV- Packed cell volume; FFP- fresh frozen plasma; PRP- platelet rich plasma; D- days ; ltr-litres; ICU – intensive care unit

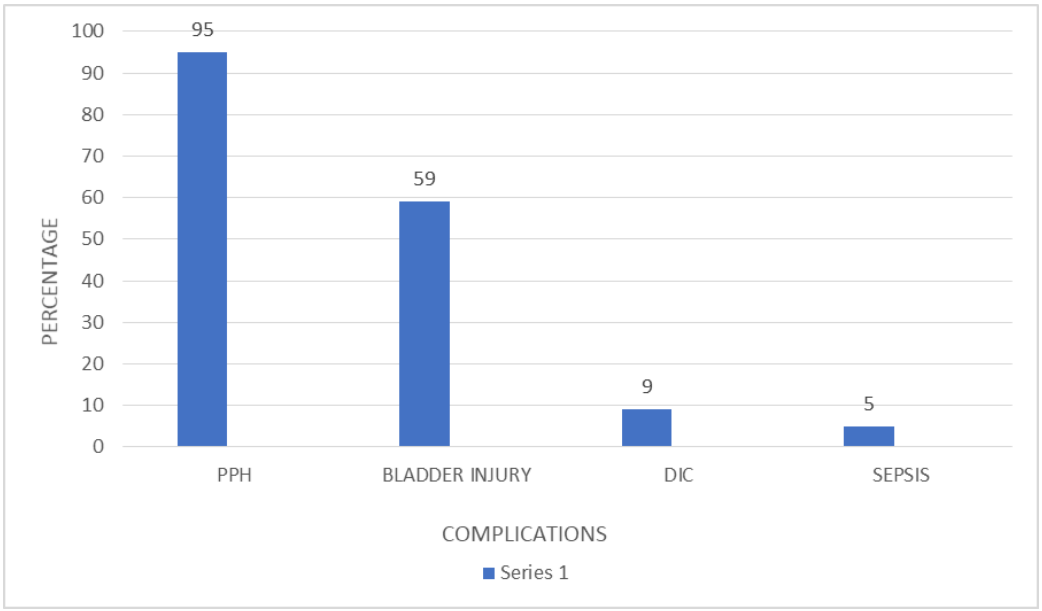

Fig 1: Maternal complications

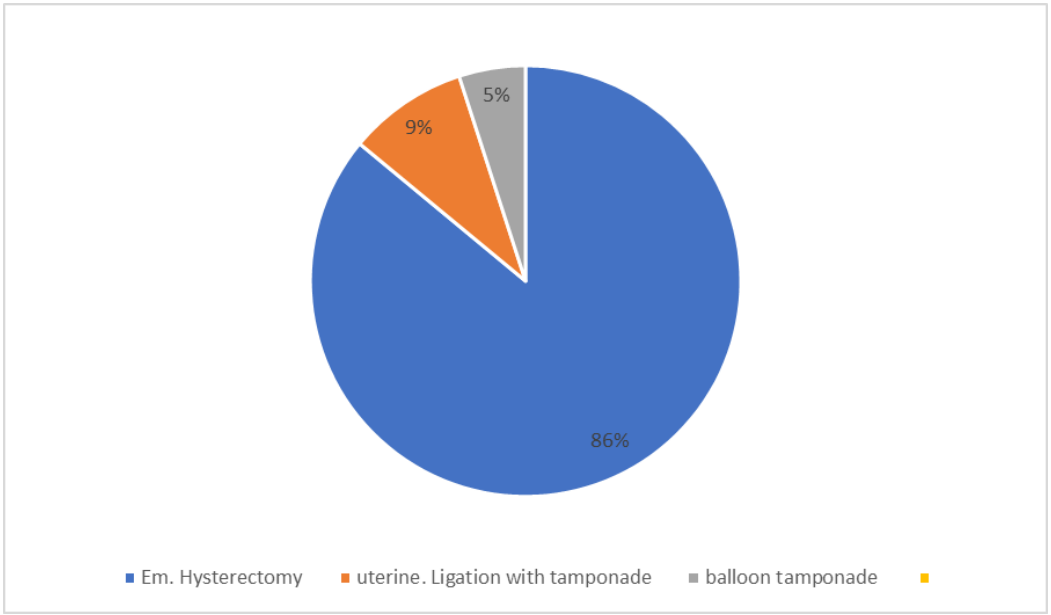

Fig 2: Management of PPH

Eighty percent of the patients in our study had live births, 10% had macerated still births and 10% had fresh still births. The neonatal ICU admission rate was 50% and 38% of the live births were having low birth weight. Out of total NICU admissions, 88% were discharged in stable condition and there was one neonatal mortality due to prematurity and respiratory distress.

Discussion

Placenta accrete spectrum (PAS) is a very devastating complication of pregnancy. It is a spectrum of abnormal placental attachment to the myometrium or even invading the myometrium, reaching beyond serosa and involving the adjacent organs. The incidence of PAS in this study was 0.09% i.e one per 1034 deliveries, thereby, showing an rising trend over previous years. Previously, the incidence of PAS at our institute was one per 2490 deliveries during 2007-11 [7]. This increasing incidence is due to worldwide increase in the rates of caesarean sections over previous decades. The incidence in our study was higher than the incidence found by Wadhwa *et al* (0.048%) [8] and Aggarwal *et al* (0.04%) [9].

The mean age of women with PAS in our study was 29.8 years and this was comparable to the study by Aggarwal *et al.* [9] but lower when compared to the study by Rizvi SM *et al.* [10] In our study, the most significant risk factors for the placenta accrete spectrum were previous caesarean section and placenta previa; each present in 72% of the women with PAS. It has been revealed in a prospective study that risk of Placenta accrete spectrum was 3% in women with placenta previa and no prior caesarean section but 11% in women with placenta previa with one previous caesarean section. The risk increases to 40 % to those with history of two caesarean section and risk more than 60% in those with three prior caesarean sections and co-existing placenta previa. But risk of accrete is 1% in women with three or more caesarean sections and no placenta previa [11]. Other risk factors for PAS mentioned in literature are history of myomectomy, dilatation and curettage, multiparity, advanced maternal age, erythroblastosis fetalis, thermal ablation and uterine artery embolization [12, 13, 14].

Majority of the patients in our study were diagnosed during intra-operative period. This may be due to the reason that ours is

a tertiary referral institute and majority of the patients were referred from peripheral centres due to ongoing haemorrhage. All of these were operated on emergency basis. However, diagnosis of PAS in antenatal period is highly recommended because outcomes are optimized when delivery occurs at a level III or IV maternal care facility before the onset of labour or bleeding with avoidance of placental disruption [15-18]. Antenatal obstetric ultrasonography is the primary diagnostic modality to establish the diagnosis of placenta accrete spectrum. Magnetic resonance imaging should be considered for the diagnosis only when ultrasound findings are inconclusive, in cases of posterior placenta accreta and to assess the depth of invasion in cases of placenta percreta.

Maternal mortality in our study was 9% (n=2). Both these patients were admitted in an exsanguinated state and PAS was not diagnosed prior to surgery. This was higher when compared to Malhotra *et al* (5%) [7] and comparatively very low when compared to Aggarwal *et al* (30%) [8]. The management of PAS should always involve a multidisciplinary team including expert obstetrician who should also be expert in pelvic surgery, a urologist, consultant anaesthetist, an interventional radiologist, neonatologist, intensivist and staff from blood bank. There should always be an alert to the blood bank prior to operating PAS patients keeping in view the risk of massive intra-operative haemorrhage in these cases. A multi-disciplinary approach including careful planning of surgery, adequate timely transfusion of blood and blood products is the key for the successful outcome in patients with this precarious condition of PAS. Pre-operative planning for patients with PAS should include informed consent including the possible surgical strategies, complications, blood transfusions and collaboration with the required above mentioned departments.

The most optimal accepted surgical approach to patients with PAS is planned preterm caesarean hysterectomy with placenta left in situ after delivery of the foetus. No attempts should be made to remove the placenta since it has been associated with significant risk of profuse intra-operative haemorrhage [19].

Surgery for PAS should be planned in elective operation theatre at period of gestation 35-36 weeks with the adequate arrangement of blood and blood products and involvement of the multi-disciplinary team. The conservative surgical strategies may have a role in certain carefully selected patients who desire for future fertility. Several adjuvant techniques along with surgery may also be used such as methotrexate treatment, pre-operative internal iliac artery balloon catheters for arterial occlusion and/or arterial embolization [20].

Conclusion

There is an dramatic increase in incidence of Placenta accrete spectrum and the increasing number of caesarean sections worldwide is a direct contributory factor. There is an urgent need for decreasing the rates of caesarean sections especially in primigravida. Timely audit of the caesarean sections may prove beneficial for keeping a check on the rates of caesarean sections. Obstetricians should always suspect this morbid condition in presence of risk factors, especially placenta previa and previous caesarean section. Antenatal diagnosis of PAS is an important step for implementation of multi-disciplinary approach in the management of PAS, thereby, decreasing maternal and neonatal morbidity and mortality

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