Original Research Article

Placenta previa and it's maternal and fetal outcome- A prospective observational study in a tertiary care hospital of West Bengal

Salma Khatun[1*], Aftabuddin Mondal[2], Soumitra Mondal[3], Tanjib Hassan Mullick[4]

[1]Medical Officer (G&O), Garden Reach SSH, South 24 Parganas, West Bengal, India
[2]Associate Professor, Department of Obstetrics & Gynaecology, Calcutta National Medical College & Hospital, Kolkata, West Bengal, India
[3]Tutor, Community Medicine Department, Medical College Kolkata, West Bengal, India
[4]Assistant Professor, Community Medicine Department, Medical College Kolkata, West Bengal, India

Received: 24-11-2021 / Revised: 18-12-2021 / Accepted: 07-01-2022

Abstract

Background: Placenta previa is characterized by the abnormal placenta overlying the endocervical os, and it is known as one of the most feared adverse maternal and fetal-neonatal complications in obstetrics. **Objectives**: We aimed to find out the prevalence of placenta previa including Morbidly Adherent Placenta amongst pregnant mothers attending antenatal OPD and Emergency Department and evaluate maternal and fetal outcome in all cases of placenta previa. **Methods:** A prospective observational study was carried out in the department of Obstetrics and Gynaecology of a Tertiary Care hospital in Kolkata. Data from one hundred and twenty pregnant women presenting with bleeding per vagina during the third trimester of pregnancy either symptomatic or asymptomatic with ultrasonographic diagnosis of placenta previa. Department during the one-year period from 1st April 2020- 31st March 2021 were analysed. Demographic data including age, parity, gestational age and previous caesarean delivery or other uterine surgery, details of medical and obstetric history and information on the intraoperative and postoperative events were recorded. Descriptive analysis was used to report the frequency of maternal and neonatal adverse outcomes. **Result**: The incidence of Placenta previa was 1.03%. Majority (62.9%) were unbooked cases. Placenta previa cases was highest in the age group 22-30 years (80.9%). It was found that second gravida formed majority of the cases (42.5%), 68.4% of the cases presented at 37 weeks gestational age. From this study, we found that clinical presentation with antepartum haemorrhage was seen in 76 (63.4%) case. Among the admitted PP patients,108 (90%) of the cases were in the class 1 category of Benedetti classification. Out of the120 neonates born, 5 (4.1%) were still born. Out of 115 live-born babies, 56 (48.7%) required NICU admission. Among these neonates 6.7% were in early preterm.

Keyword: Placenta previa, prevalence, Maternal outcome, Neonatal outcome.

Introduction

Placenta previa (PP) is characterized by the abnormal placenta overlying the endocervical os, and it is known as one of the most feared adverse maternal and fetal-neonatal complications in obstetrics[1]. Women with placenta previa are at an approximately 4-fold increased risk of second trimester vaginal bleeding[2]. In addition, peripartum hysterectomy, blood transfusion, postpartum haemorrhage, and placenta accreta are also associated with placenta previa. Fetal complications with placenta previa are primarily those prone for prematurity and intrauterine growth restriction. In turn, neonatal mortality rates are increased by about 4-fold in singleton pregnancies with placenta previa[3]. Although the etiology of placenta previa is still unknown, the pathogenesis is likely to be the result of endometrial damage and uterine scarring[4].

Patient mainly presents with a history of painless vaginal bleeding. The bleeding happens from the placental site which lies in the lower uterine segment, which is being stretched during the later-half of pregnancy. During pregnancy it may be asymptomatic or may present with ante partum haemorrhage, whereas in the intra partum period it may be retained and associated with postpartum hemorrhage. Other maternal complication includes severe haemorrhage, shock, puerperal sepsis etc. Placenta previa is associated with high perinatal mortality and morbidity.

*Correspondence
Dr. Salma Khatun
Medical Officer (G&O), Garden Reach SSH, South 24 Parganas, West Bengal, India

Some cases of placenta previa may be complicated with morbidly adherent placenta (MAP). It is a life threatening situation for pregnant women especially in resource poor countries like India. If it is not detected and treated accordingly then outcome of the pregnancy may be unfavourable due to various antenatal, intranatal and post-natal complications.

A study reported that the overall prevalence of placenta previa was approximately 5 per 1000 pregnancies by world region, however, there is also some evidence suggestive of regional variation[5]. The risk factors for placenta previa as well as MAP includes previous uterine surgery, e.g., previous caesarean section, myomectomy, dilatation and curettage, multiparty, multifetal gestation, advance maternal age, trauma, etc[6]. Low socioeconomic status and unavailability of adequate health care facility favour the prevalence of the maternal and perinatal outcome in placenta previa as well as MAP. In our country the incidence of placenta previa is 0.82% and among them the incidence of post-partum hemorrhage was found to be 73.2 %[7].

Although previously studies provided lots of valuable information, they focused on one or several provinces rather than nationally representative sample of pregnancies population. The data of placenta previa remain incompletely limited. There has been no study was conducted in West Bengal. Therefore, we aimed to find out the prevalence of placenta previa including Morbidly Adherent Placenta amongst pregnant mothers attending antenatal OPD and Emergency Department and evaluate maternal and fetal outcome in all cases of placenta previa.

Methods

A prospective observational study was carried out in the department of Obstetrics and Gynaecologyof a Tertiary Care hospital in Kolkata. Data from one hundred and twenty pregnant women presenting with bleeding per vagina during the third trimester of pregnancy either symptomatic or asymptomatic with ultrasonographic diagnosis of placenta previa attending Antenatal Clinic or the Emergency Department during the one-year period from 1stApril 2020- 31stMarch 2021 were analysed. All cases of placenta previa when confirmed by either transabdominal ultrasonography or transvaginal ultrasonography after 28 weeks of gestation were included in this study. Cases before 28 completed weeks, pregnant women who were diagnosed of having low lying placenta and other types of Antepartum Hemorrhage (APH) like abruptio placente, local causes, traumatic haemorrhage, and indeterminate causes were excluded from the study. The study was approved by the Institutional Ethics Committee of Calcutta National Medical College and Hospital, Kolkata.

Demographic data including age, parity, gestational age and previous caesarean delivery or other uterine surgery, details of medical and obstetric history and information on the intraoperative and postoperative events were recorded.

Descriptive analysis was used to report the frequency of maternal and neonatal adverse outcomes. Maternal outcomes included: maternal ICU stay during the delivery hospitalization, clinically determined estimated blood loss (EBL), number of units of packed red cells transfused, units of fresh frozen plasma transfused, units of cryoprecipitate transfused, units of platelets transfused, significant hypotension (defined as systolic blood pressure <80 mm Hg or diastolic blood pressure of <50 mm Hg on at least two occasions at least 30 minutes apart), significant tachycardia (defined as maternal pulse >120 beats per minute at any time for any duration after delivery), maternal ventilator support, any unanticipated additional maternal surgical procedures (including repair of other organs and hysterectomy), and length of stay. Neonatal outcomes recorded included gestational age at delivery, need for ventilator support within 24 hours of birth, size for gestational age (small [<10th percentile], appropriate, large [>90th percentile]) and length of neonatal stay. Because we only had data through the delivery hospitalization, complications or surgeries that occurred after delivery hospitalization discharge were not obtained.

Results

During the one-year period from 1st April 2020- 31st March 2021 there was a total of 11,544 deliveries. A total of one hundred and twenty cases of placenta previa were registered.The incidence of Placenta previa was 1.03%. Majority (62.9%) were unbooked cases. Placenta previa cases was highest in the age group 22-30 years (80.9%) followed by 17.91 % in the age group of 31-35 years. It was found that second gravida formed majority of the cases (42.5%), followed by third gravida (27.5%).

Majority (68.4%) of the cases presented at 37 weeks gestational age followed by 25% at 34-37 weeks while 4 patients (3.3%) were admitted at 30-34 weeks. The risk factors were previous caesarean section, abortion, twin gestation and myomectomy. Most common risk factor was previous caesarean section (30.8%). Out of the complications studied, severe anaemia contributed to 3.3% while malpresentations contributed to 13.3% (breech 11.7%, transverse lie 1.6%).

Table 1: Demographic profile

Parameter		No.(%)
Age in years	<21	09 (7.5%)
	22-30	97 (80.9%)
	>31	14 (11.6%)
Booking status	Booked	37 (30.8%)
	Unbooked	83 (69.2%)
Gravida	1	24 (20.0%)
	2	51 (42.5%)
	3	33 (27.5%)
	4	4 (3.3%)
	5	8 (6.7%)
Mode of admission	Emergency (ER)	106 (88.3%)
	Outdoor patient department (OPD)	14 (11.7%)

From this study, we found that clinical presentation with antepartum haemorrhage was seen in 76(63.4%) case. Among 120 cases of placenta previa 3 cases (2.5%) had morbidly adherent placenta which is diagnosed by USG. According to mode of admission 106 (88.3%) patients were admitted through Emergency and 14 (11.7%) were admitted through OPD. Majority 82 (68.4%) of the cases presented (68.4%) during gestational age 37 weeks and above followed by 30 (25%) at 34-37 weeks; and 4 patients (3.3%) were admitted at 30-34 weeks and 30 weeks gestation age respectively. Among 120 PP cases, severe anemia was found in 3.3%, moderate anemia was found in 29.2 % patients, while majority was having mild anemia (58.3%). Only 9.2% had hemoglobin above 11gm/dl. Almost one third suffered from moderate to severe anemia on admission. Most common risk factor was previous history of abortion (40%) followed in order by cesarean section (40%), previous one cesarean section and one D&E (13.8%), previous two cesarean section (7.7%), previous two cesarean section (6.2%) and previous two cesarean section one D&E (3.1%). Myomectomy was found in 3.1% of the cases.

Table 2: Antenatal profile of patients

Antenatal profile	No. of Patient
No. of patients with previous history of abortion	28 (40%)
No. of Patients with diagnosed MAP in USG	3 (2.5%)
No. of patients diagnosed PP in ER	106 (88.3%)
No. of patients diagnosed PP < 30 weeks of gestation	4 (3.3%)
No. of patients diagnosed PP 30-34 weeks of gestation	4 (3.3%)
No. of patients diagnosed PP 34-37 weeks of gestation	30 (25%)
No. of patients diagnosed PP >37 weeks of gestation	82 (68.4%)
No. of patients presented with antepartum haemorrhage	76 (63.4%)
No. of patients haemoglobin level < 6.9 g/dl	4 (3.3%)

Among the admitted PP patients,108 (90%) of the cases were in the class 1 category of Benedetti classification followed by class 2 constituted around 7.5% and class 3 which made up 2.5 % of the cases (Beneditti's classification of haemorrhage). According to type of placenta previa, it shows that 68 (56.7 %) cases had low lying placenta, 16 (13.3 %) had marginal placenta previa, 7 (5.9%) had partial placenta previa and 29 (24.1 %) had total placenta previa.

Table 3: Type of MAP. (n = 120)

Types of Placenta Previa	Number of Cases
Low Lying	68 (56.7%)
Marginal	16 (13.3%)
Partial	7 (5.9%)
Total	29 (24.1%)

In the present study massive blood transfusion was required in 35.4%of all cases, haemostatic suture and blood transfusion in 13.7%, only haemostatic suture in 5.9% cases, uterine artery ligation in 13.7%, medical management in 11.7% cases, pressure compression in 5.9% and peripartum hysterectomy and blood transfusion in 13.7% cases. 12 (10%) cases there was some postpartum complications. Out of the 12 cases, 41.7% had post-partum haemorrhage. Wound infection comprised of 33.3% followed by sepsis 25%. 98 (81.7%) of the cases required HDU admission following operation. Out of 120 admitted patients 114 (95 %) cases had a hospital stay of <10 days, 4 (3.3%) needed a stay of 11-15 days while 2 (1.7%) cases required long hospital stay of >16- 20 days. The mean of hospital stay is 8.1 days. 72 (60%) patients required blood/blood products transfusion, 13 (10.9%) patients cured with minor complications. Out of the 13 cases cured with minor complications, 6 (46.2%) having hypertension followed by anemia 5 (38.4%) and urinary tract infection 2 (15.4%).

Table 4: Morbidity associated with PP.

Morbidity	No. of Patient
Characteristics no. % hysterectomy	7 (13.7%)
HDU transfer	98 (81.7%)
Prolong hospital stay (> than 16 days)	(1.7%)
Blood transfusion	18 (35.4%)
FFP	30 (41.7%)
Internal iliac artery ligation	7 (13.7%)

Out of the120 neonates born, 5 (4.1%) were still born. Out of 115 live-born babies, 56 (48.7%) required NICU admission. Among these neonates 6.7% were in early preterm and 22 (18.4 %) were having birth weight less than 2 kg. Out of 56 infants admitted in NICU, 17 (30.3%) needed to stay for 2-5 days and 4 (7.2%) needed a stay more than 6 days and rest 35 (62.5%) stay for less than 2 days.
3 (13.1%) neonates died at NICU.

Table 5: Neonatal outcome

Neonatal outcome	No. of Patient
Average gestational age	34 weeks
Preterm newborn among live births	38 (31.7%)
Average birth weight	2.6 kg
Baby shifted to NICU	23 (20%)
Baby stayed in NICU > 2 days	21 (37.5%)
No of dead at NICU	3 (13.1%)

Discussion

The occurrence rates of placenta previa reported in epidemiological studies were considerably different among different countries.In Japan,the prevalence of placenta previa was 1.39 per 100 singleton births[8], whereas the rate was only 0.42% in a population-based study in Israel[2]. In retrospective studies, the occurrence rates of placenta previa among singleton pregnancies of women were 0.73%, 1.00%, 1.10%, 1.50%, and 2.80% in Saudi Arabia[9], Greece[10], Australia[11], Korea[12], and USA[13] respectively. In our study the prevalence of previa is 1.03%. A meta-analysis conducted by Fan D et al in china in 2016 showed similar prevalence of placenta previa which was 1.24%[14]. One explanation for the variation in the reported prevalence is due to the geographic or ethnic differences between populations.

Majority of women belonged to 22- 30 years (80.9%) being parous women. Similar finding was noted in a study done by Rajeshwari RR et al[7] in Tamil Nadu that showed the highest number of cases with PP was age group 20-29 years (79.9%). The incidence of MAP in our study was 20%. The high incidence of MAP in our study could be attributed to our hospital being a tertiary refer center. Sarojini et al[15] reported that 0.64% of the deliveries were complicated with placenta previa and that 4.7% had MAP. Gilliam et al[16]. also reported an increasing incidence of PP both parity and previous Caesarean sections increased and found that the joint effect of parity and prior Caesarean sections was greater than that of either variable alone; the likehood of PP in a woman with parity greater than four and with more than four previous Caesarean sections was almost nine fold greater.

The study conducted by Rajeshwari RR et al[7]. showed that the number of unbooked cases were 84.6% and 84.3 % each whereas in our study, 69.2% unbook cases are found. ANC care should have more booked patients by high risk screening for the betterment of the maternal and neonatal welfare and for the upliftment of our demographic statistics to the international standards. The most common gestational age in our study group, which presented with bleeding was 37 weeks and above (68.4%).

In the present study, majority were primi para (62.5%), while 30.8% were multipara, and 6.7% were grand multipara. The percentage of multigravida and grand multipara much lesser than the previous studies done by Michelle AW[17] (61.16% for multigravida and 12.5% for grand multipara), and Steven Clark[18] (44.06% for multigravida and 30.9% for grand multipara). We found that 54.1% of the placenta previa study group had history of previous uterine surgery with 56.9% having history of caesarean section. One group of authors have reported from a tertiary center in India that 46% (57/124) cases had history of previous uterine surgery in the form of caesarean section, myomectomy or curettage[19]. Another study showed that 42.6% patients had a history of prior caesarean section and 26.5% had a previous history of abortion[20]. It has been well established in most of the studies that previous uterine surgery and uterine curettage are risk factors for placenta previa and our study concludes the same.

From our study we found that 13.3% malpresentations was present and breech presentation (11.7%) being the most common. The finding of breech presentation is much lesser than study conducted by P.Rani Reddy[21] where malpresentations found 20% cases and study conducted by Mc shane[22].

When compared with the study done by McShane (1985)[22], our study has higher rates of sepsis, and UTI. In comparison to Rajeswari R[7] study, the present study had higher rates of PPH. Proper hygiene, more appropriate and prompt attempt in the management of placenta previa with complete dose of antibiotics with aseptic precautions are needed. The prevalence of morbidly adherent placenta is 0.025%. Similar finding is found in Ranjana R et al[23].

The main newborn complication was prematurity and the average gestational age in our study was 34 weeks. 31.7% of the newborns were preterm with an average birth weight low birth weight 2.6 Kg. The perinatal mortality was 13.1%. So there are potential risk factors and outcomes of pregnancies in patients with incidence of placenta praevia.

Conclusion

In the present study 120 cases of placenta previa were studied. As per SRS estimates for perinatal mortality rate in India for the year 2016 it was 23 per 1000 live births[24]. The perinatal mortality rate in west Bengal state for the year 2016 was 16 per 1000 live births. In the present study the perinatal mortality rates due to placenta previa was 69 per 1000 live births i.e., approximately 3 time higher than the general perinatal mortality rate. The maternal mortality rate due to placenta previa in this study was nil but maternal morbidity was high as the cases had antenatal, intranatal and/ or postnatal complications and since the pre-existing anaemia among pregnant women may have a contributory factor for maternal morbidity. For the same reason there was high requirement of blood transfusion. Thus direct efforts to correct anaemia in pregnancy and antepartum haemorrhage are needed.In order to reduce the placenta previa and morbidly adherent placenta a small family size to 1-2 child and efforts in reducing the primary C/S is needed. Timely referral to higher centres at the earliest is required. The availability of ultrasonography and experienced and skilled radiologist/sonologists for screening and proper diagnosis of abnormal placental localization and placental separation plays an important role in the early diagnosis of placenta previa thereby helps in proper management of the patient.

As the maternal and perinatal morbidity and mortality as a complication of placenta previa is preventable, efforts are to be taken to bring down these rates. This can be achieved by better spacing in between pregnancies, antenatal registration of all pregnant women, routine check-up, routine use of USG in pregnancy and early referral of high risk pregnant women to tertiary care centres.

Community awareness should be made. The health workers such as ASHA, anganwadi workers, ANM, should inform and educate them for birth preparedness and early detection of complications. Awareness about various maternal and child health schemes should be brought about in the urban slums and rural public to avail the facilities provided by the government. All should be made aware specially the females regarding antenatal care, postnatal care, various government schemes like Janani Suraksha Yojana, importance of institutional delivery, importance of family planning, importance of iron folic acid supplementation and immunization will be a huge step towards decreasing the maternal and perinatal morbidity and mortality due to morbidly adherent placenta and placenta previa.

In spite of the Government of India and The State Government of West Bengal doing a remarkable and praiseworthy progress and strengthening the establishment of District and Sub-Divisional Hospitals for management by bringingblood bank facilities, obstetricians and anaesthetists, there is still a huge scope for improvement. Delay in referral from lower centres has made the situation more complicated for women with APH which contributes to maternal morbidity and mortality.

There is need of well-functioning of the existing facilities and establishment of more facilities to provide quality care to the patients, so as to reduce the huge workload in Tertiary care centres and Medical Colleges. Lastly a strong referral system, with readily availability of services and awareness among the general population can contribute to the improvement of maternal and fetal outcome. In all high-risk pregnancies these measures will definitely help in a better outcome for both mother and foetus.

References

1. Silver RM. Abnormal Placentation: Placenta Previa, Vasa Previa, and Placenta Accreta. Obstet Gynecol. 2015 Sep;126(3):654–68.
2. Rosenberg T, Pariente G, Sergienko R, Wiznitzer A, Sheiner E. Critical analysis of risk factors and outcome of placenta previa. Arch Gynecol Obstet. 2011 Jul;284(1):47–51.
3. Ananth CV, Smulian JC, Vintzileos AM. The effect of placenta previa on neonatal mortality: A population-based study in the United States, 1989 through 1997. Am J Obstet Gynecol. 2003 May 1;188(5):1299–304.
4. Placenta previa associated with severe bleeding leading to hospitalization and delivery: a retrospective population-based cohort study - PubMed [Internet]. [cited 2022 Jan 25]. Available from: https://pubmed.ncbi.nlm.nih.gov/26653989/
5. Cresswell JA, Ronsmans C, Calvert C, Filippi V. Prevalence of placenta praevia by world region: a systematic review and meta-analysis. Trop Med Int Health TM IH. 2013 Jun;18(6):712–24.
6. Vora K, Chandana P, Patel A, Jain M. A prospective study of 20 cases of maternal outcome in morbidly adherent placenta in tertiary care hospital. Int J ReprodContraceptObstet Gynecol. 2017 Jan 31;6(2):571–4.
7. R RR, M R. Maternal and perinatal outcome in placenta previa - one year study in tertiary care center in Tamil Nadu, India. Int J ReprodContraceptObstet Gynecol. 2017 Jan 11;5(8):2819–22.
8. Matsuda Y, Hayashi K, Shiozaki A, Kawamichi Y, Satoh S, Saito S. Comparison of risk factors for placental abruption and placenta previa: case-cohort study. J ObstetGynaecol Res. 2011 ;37(6):538–46.
9. Bahar A, Abusham A, Eskandar M, Sobande A, Alsunaidi M. Risk factors and pregnancy outcome in different types of placenta previa. J ObstetGynaecol Can JOGC J ObstetGynecol Can JOGC. 2009 Feb;31(2):126–31.
10. Daskalakis G, Simou M, Zacharakis D, Detorakis S, Akrivos N, Papantoniou N, et al. Impact of placenta previa on obstetric outcome. Int J GynaecolObstet Off Organ Int Fed Gynaecol Obstet. 2011 Sep;114(3):238–41.
11. McCormack RA, Doherty DA, Magann EF, Hutchinson M, Newnham JP. Antepartum bleeding of unknown origin in the second half of pregnancy and pregnancy outcomes. BJOG Int J ObstetGynaecol. 2008 Oct;115(11):1451–7.
12. Jang DG, We JS, Shin JU, Choi YJ, Ko HS, Park IY, et al. Maternal Outcomes According to Placental Position in Placental Previa. Int J Med Sci. 2011 Jul 23;8(5):439–44.
13. Eichelberger KY, Haeri S, Kessler DC, Swartz A, Herring A, Wolfe HM. Placenta previa in the second trimester: sonographic and clinical factors associated with its resolution. Am J Perinatol. 2011 Oct;28(9):735–9.
14. Prevalence of placenta previa among deliveries in Mainland China: A PRISMA-compliant systematic review and meta-analysis - PubMed [Internet]. [cited 2022 Jan 25]. Available from: https://pubmed.ncbi.nlm.nih.gov/27749592/
15. Sarojini, V MK, Radhika. Clinical study of placenta previa and its effect on maternal health and fetal outcome. Int J ReprodContraceptObstet Gynecol. 2016 Dec 15;5(10):3496–9.
16. Gilliam M, Rosenberg D, Davis F. The likelihood of placenta previa with greater number of cesarean deliveries and higher parity. Obstet Gynecol. 2002 Jun;99(6):976–80.
17. Increasing maternal age as a determinant of placenta previa. More important than increasing parity? - PubMed [Internet]. [cited 2022 Jan 25]. Available from: https://pubmed.ncbi.nlm.nih.gov/8331620/

18. Clark SL, Koonings PP, Phelan JP. Placenta previa/accreta and prior cesarean section. Obstet Gynecol. 1985 Jul;66(1):89–92.
19. C MS. Maternal and fetal outcome of Placenta Previa at a tertiary centre in North Kerala, India. Int J Reprod Contracept Obstet Gynecol. 2018 Apr 28;7(5):1723–9.
20. Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. Lancet Lond Engl. 2006 Apr 1;367(9516):1066–74.
21. 1999_53_55_Jun.pdf [Internet]. [cited 2022 Jan 25]. Available from: https://jogi.co.in/articles/files/filebase/Archives/1999/jun//1999_53_55_Jun.pdf
22. McShane PM, Heyl PS, Epstein MF. Maternal and perinatal morbidity resulting from placenta previa. Obstet Gynecol. 1985 Feb;65(2):176–82.
23. Desai R, Jodha BS, Garg R. Morbidly adherent placenta and it's maternal and fetal outcome. Int J ReprodContraceptObstet Gynecol. 2017 Apr 27;6(5):1890–3.
24. Park K. Park's textbook of preventive and social medicine. Jabalpur: M/S BanarsidasBhanot; 2009.

Conflict of Interest: Nil Source of support: Nil