

Original Article

Maternal Risk Factors of Placenta Praevia and Its Effects on Maternal and Fetal Outcome

* Adhikary A¹, Begum A², Sharmin F³, Sarker NR⁴, Sultana R⁵

Abstract

Placenta praevia is one of the most serious obstetric emergencies, which continues to be an important contributor to perinatal mortality and is responsible for leading maternal and infant morbidity. Very few data on etiology of placenta praevia are available till now. This study aims to explore the maternal risk factors related to occurrence of placenta praevia and its effects on maternal and fetal outcome. This cross-sectional observational study was carried out among 3279 obstetrics patients admitted in labour ward in the Department of Obstetrics and Gynecology, Sher-e-Bangla Medical College Hospital from January to December 2006. Out of 3279 obstetrics patients 93 placenta praevia cases were identified purposively as study subjects. The patients of placenta praevia were selected either diagnosed clinically by painless antepartum haemorrhage or asymptomatic placenta praevia diagnosed by ultrasonography irrespective of age, gestational age, parity, booking status. Pregnant woman admitted with painful antepartum haemorrhage were excluded from the study. With the ethical approval from the Institutional Ethical Committee (IEC), patients were selected after taking their written consent. A structured questionnaire and a chick list were designed with considering all the variables of interest. Out of 93 respondents, 73.88% were associated with risk factors in addition to

advanced maternal age and high parity. Among them 24.73%, 33.33% and 7.52% had history of previous caesarean section (CS), MR and abortion and both CS & abortion previously. Patients aged above 30 years were 47% and 35.48% were in their 5th gravid and more; whereas, 31.18% patients were asymptomatic, 68.82% patients presented with varying degree of vaginal bleeding, among them 12.08% were in shock. Active management at presentation was done on 76.34% patients and 23.66% were managed expectantly. CS was done on 82.79% patients and only 17.2% were delivered vaginally. Case fatality rate was 1.07% and about 22% perinatal death was recorded, majority belonged to low birth weight (<1500 gm). About 10% patients required caesarean hysterectomy, 3.22% required bladder repair. Advanced maternal age, high parity, history of previous CS and abortion found to be common with the subsequent development of placenta praevia. Proper diagnosis, early referral and expectant management of patients will reduce prematurity, thereby improvised foetal outcome but to improve maternal outcome rate of primary CS have to be reduced and increase practice of contraception among women of reproductive age..

Keywords: Placenta praevia, risk factors, caesarean section, fetomaternal outcome

INTRODUCTION

Around the world, each year about 300,000 women die from pregnancy related complications 99% of them occurring in developing countries¹. It is evident that 70-80% of all maternal deaths resulting from complication of pregnancies like haemorrhage, eclampsia, obstructed labour, rupture uterus, sepsis and induced abortion². Placenta praevia is one of the major cause of bleeding in third trimester, responsible for many maternal deaths in developing countries due to widely spread pre-existing anaemia, difficulties with transport and unavailable medical facilities³. Maternal mortality in developed countries continues to be an important contributor to perinatal mortality and is responsible for high rate of maternal and infant morbidity.

Placenta praevia is one of the most serious obstetric emergencies and often presents without warning. It complicates approximately one in 200 pregnancies, with

*1. Dr. Alpana Adhikary, Associate Professor, Department of Gynae & Obs, Shaheed Suhrawardy Medical College Hospital, Dhaka. E-mail: alpanaadhikary@gmail.com

2. Dr. Anwara Begum, Associate Professor, Department of Gynae & Obs, Dhaka Medical College Hospital, Dhaka.

3. Dr. Fahmida Sharmin Joty, Assistant Professor, Department of Gynae & Obs, Care Medical College Hospital, Dhaka.

4. Dr. Nihar Ranjan Sarker, Associate professor, Dept of paediatrics, Shaheed Suhrawardy Medical College Hospital, Dhaka.

5. Dr. Rifat Sultana, Junior Consultant, Department of Gynae & Obs, Shaheed Suhrawardy Medical College Hospital, Dhaka.

*For correspondence

the incidence ranging from 0.29% - 1.24% of pregnancy obtains from various studies⁴. Very few updated data on etiology of placenta praevia are available till now. The incidence of placenta praevia are raised in the last decade mainly owing to increasing rate of caesarean section⁵, advanced maternal age at the time of first pregnancy and increased number of parity^{6,7}. Some studies revealed placenta praevia are also associated with potential risk factors such as spontaneous abortion or induced abortion, previous uterine operations, previous placenta praevia, smoking, multiple gestation and others.⁸⁻¹⁰ But other factors which are associated with placenta praevia also varies from study to study.

Placenta praevia is an important determinant of adverse perinatal outcome. Various reviewed literatures support that it carried an appallingly high perinatal mortality in the past^{11,12}. With the advent of ultrasonographic evaluation of placenta praevia with foetal maturity, conservative expectant management in preterm pregnancies and availability of neonatal care unit has brought an important impact on perinatal outcome^{8,13,14}. Cotton et al showed a perinatal mortality rate 12.6% roughly a half [decade?] of earlier studies¹⁵.

Though there are various studies on placenta praevia and its management, this study was an endeavor to explore the maternal risk factors related to occurrence of placenta praevia and its effects on maternal and fetal outcome in a peripheral medical college hospital in Bangladesh.

MATERIAL AND METHOD

This cross-sectional observational study was carried out among 3279 obstetrics patients admitted in labour ward in the Department of Obstetrics and Gynecology, Sher-e-Bangla Medical College Hospital from January to December 2006. Purposive sampling technique was followed in this study to include all the patients of placenta praevia from the total 3279 obstetrics patients. A total number of 93 patients of placenta praevia were identified as study subjects. The patients of placenta praevia were selected either diagnosed clinically by painless antepartum haemorrhage or asymptomatic placenta praevia diagnosed by ultrasonography irrespective of age, gestational age, parity, booking status. Pregnant woman admitted with painful antepartum haemorrhage were excluded from the study.

With the ethical approval from the Institutional Ethical Committee (IEC), patients were selected after taking their

written consent. From 3279 obstetrics patients, 93 subjects met the selection criteria. A structured questionnaire and a chick list were designed with considering all the variables of interest.

Data were collected through face to face interview and checking medical records of the patients at the respective departments by the researcher and competent colleagues. Detailed history regarding active per vaginal bleeding or history of per-vaginal bleeding and pregnancy outcome of patients were recorded. Patients were examined and investigated meticulously. Ultrasonogram was done in a number of patients, few cases were diagnosed during caesarean section. For patients who have vaginal deliveries, partograph was maintained. Postnatally, patients were followed up for PPH, infection, rate of involution and sepsis. Newborn were examined for birth weight, congenital anomalies, injuries and Apgar score were recorded at 1 minute and at 5 minutes.

Collected data were checked and edited first. Then data entry, data cleaning, data processing and lastly analysis of data were done by using of software Statistical Package for Social Sciences (SPSS, Version 16). The test statistics used to analysis the data were descriptive statistics; interference were drawn according to findings of the study.

RESULTS

This cross-sectional observational study was conducted among 3279 obstetrics patients from where a total number of 93 patients of placenta praevia were identified as study subjects. The age range of study subjects was of 18-45 years.

Table I shows that, among 3279 obstetrics patients, 93 (2.83%) patients were placenta praevia.

Table-I: Distribution of placenta praevia (PP) cases among obstetric patients (n=3279)

Total no of obstetric patients	No of placenta praevia	Percentage
3279	93	2.83

Table II shows that the highest no. of 36 (38.71%) PP patients were in age group 30-34 years. Maternal age <20 years was only 2.15% and >35 years was 8.6%. Other two age group 20-24 years and 25-29 years were 23.65% and 26.88% respectively. Regarding the socio-economic status, lower (46.24%) and lower middle class group (25.80%).

Only 18.27% and 9.67% were in Upper middle and Upper class socio-economic group.

Table II: Distribution of maternal age and economic status of PP patients (n=93)

	Number of patients	Percentage
Maternal age group in years		
<20	02	2.15
20-24	22	23.65
25-29	25	26.88
30-34	36	38.71
>35	08	8.60
Economic status		
Lower	43	46.24
Lower-middle	24	25.80
Upper middle	17	18.27
Upper	09	9.67

Table III shows that (90.4%) was multi gravida, of which 35.48% were grand multipara. Maximum number of cases (31.18%) were admitted in gestational period between 35-37 weeks. Breech presentation were 13.97% and transverse lie were 4.30%. Regarding risk factors of PP, 73.11% patients were associated with different risk factors; among them 33.33% were associated with previous abortion, MR and D, E & C, where 24.73% were with caesarean section, 7.52% had both H/O caesarean section & abortion. Other contributing factors were manual removal of placenta, history of APH, multiple pregnancy, Cigarette smoking. No risk factors could be identified in 26.88% cases.

Table III: Distribution of the obstetric factors among the cases of PP (n=93)

Obstetric factors	Number of patients	Percentage
Gravida		
Primi	09	9.6
2nd gravida	14	15.03
3rd gravida	18	19.35
4th gravida	19	20.24
≥ 5th gravida	33	35.48
Gestational age in weeks during presentation		
29 -31	17	18.28
32-34	24	26.0
35-37	29	31.18
≥38	23	24.73

Table III (Cont'd)

Obstetric factors	Number of patients	Percentage
Presentation of foetus		
Cephalic	76	81.72
Breech	13	13.97
Transverse	04	4.30
Obstetric risk factors predisposing to placenta praevia		
H/O CS	23	24.73
Previous MR, abortion, D,E &C	31	33.33
H/O CS +Abortion	7	7.52
H/O manual removal of retained placenta	2	2.15
H/O previous APH	1	1.08
H/O uterine anomaly	01	1.08
Multiple pregnancy	02	2.15
Cigarette smoking	01	1.08
No risk factor	25	26.88

Table IV: Clinical presentation of patients during admission (n=93)

Clinical presentation	Number of patients	Percentage
In labour	27	29.04
Per vaginal bleeding with shock	11	12.08
Per vaginal bleeding without shock	16	17.20
Not in labour	66	70.96
Per vaginal bleeding	37	39.78
No P/V bleeding	29	31.18

Table V: History of per vaginal bleeding in early pregnancy (n=93)

H/O per vaginal bleeding	Number of patients	Percentage
1st trimester ≤ 12 weeks	06	6.45
2nd trimester	23	24.73
No H/O early trimester bleeding	64	68.82

Table IV shows that, 29.04% patients came with labour pain, among them 12.08% were in varying degree of hypovolemic shock. 70.96% were came without labour pain and 31.18% patients were asymptomatic.

Table V shows that 6.45% cases had first trimester and 24.73 % experienced 2nd trimester haemorrhage but 68.82% patient had no history of warning haemorrhage.

Table VI shows that 31.18% patients were diagnosed during caesarean section rest of the patient were diagnosed by ultrasonography.

Table VI: Confirmatory method of diagnosis (n=93)

Methods	Number of patients	Percentage
Ultrasonogram	64	68.81
During caesarean section	29	31.18

Table VII shows the management and perinatal outcome, (76.34%) patients were managed actively and perinatal death was 25.35%, Other 23.66% were treated expectantly and the perinatal death was 23.66%.

Table VII: Methods of management and perinatal outcome (n=93)

Methods of management	No. of patients	Percentage	Perinatal death (%)
Active	71	76.34	18 (25.35)
Expectant	22	23.66	3 (13.64)

Table VIII: Foetal outcome of this series (n=95)

No. of patients	No of babies	Live birth (%)	Still birth (%)	Neonatal death (%)	Perinatal death (%)
93	95	74 (77.89)	09(9.47)	12(12.63)	21(22.10)

Table X shows that those who have Birth weight < 1500 gm perinatal deaths was 69.23% but only 4.35% perinatal death were in birth weight >2500 gm.

Table 9: Distribution of mode of delivery of among the patients (n=93)

Mode of delivery	Number of patients	Percentage
Vaginal delivery	16	17.20
Caesarean section	77	82.79

Table X: Distribution of birth weight and foetal outcome (n=95)

Birth weight	Number of baby	Perinatal death	Percentage
<1500 gm	13	9	69.23
1500-2000 gm	21	8	38.10
2000-2500 gm	29	3	10.34
2500-3000 gm	23	1	4.35
>3500 gm	9	0	0.00

Table VIII shows that out of total 93 mothers, they delivered 95 babies including 02 twin pregnancy, among them 77.89% were live births, 9.47% were still birth and 12.63% were neonatal death.

Table IX shows the delivered by caesarean section (82.79%) and 17.2% were delivered vaginally.

Table XI: Major obstetric complications (n=93)

Obstetric complications	No of patients	Percentage
Post-partum hemorrhage	17	18.28
Caesarean hysterectomy	9	9.68
Bladder injury	3	3.22
Maternal death	1	1.07

Table XI shows that, 18.28% patients had post-partum haemorrhage, 9.68% patients required caesarean hysterectomy, 3.22% required bladder repair and maternal death was 1.07%.

DISCUSSION

Placenta praevia is one of the important obstetric hazards contributing significantly to the cause of maternal morbidity, mortality & perinatal loss in developing countries. Wide spread use of USG for early diagnosis and expectant management with frequent use of caesarean section appears to be effective.¹² But in developing countries with limited facilities, patients generally present with advanced stage with moderate to severe p/v bleeding.

This study showed the rate of placenta praevia 2.83% of hospital deliveries during the period which is higher than the range reported in other literature (Annath CV.⁵ Tuzovic et al.⁶ Hussain.¹⁶

Placenta praevia occurs 2 to 3 times more commonly in above 35 years as compared to those at age 20 years or

less.^{6,8} It is more than that of Hossein et al¹⁶, Dutta⁴. Zhang J et al.¹⁷ shown that advanced maternal age has increased risk of developing placenta praevia, regardless of other known risk factors. Most of the patients (90.4%) in this study were multigravida and out of which more than one third was grand multipara (35.48%). This figure is same more or less in other series Cotton et al.¹⁵ Hussain.¹⁶ Khatun.¹⁸

In this study irrespective of age and parity 68.81% cases of placenta praevia associated with risk factor like H/O previous caesarean section in 24.73%, 33.33% had H/O abortion, MR and history of manual removal of placenta in previous pregnancy. Increased trend in caesarean section act as contributing factor for developing placenta praevia. In this study 24.73% patient has H/O caesarean section which is much higher than other studies. Several studies conducted around the world confirmed that 2.5 fold increases risk of placenta praevia development in woman with H/O previous caesarean section.^{5,6} Tylor et al.⁹ had shown threefold increase incidence of placenta praevia with H/O induced abortion.

In this study 60.22% placenta praevia diagnosed by USG which is much higher than other studies.^{16,18} Rest are diagnosed by clinical presentation and during caesarean section. As it is a referral center, several patient came with per vaginal bleeding and shock, so immediate caesarean section performed on basis of clinical diagnosis.

As this study recorded, 76.34% patients were managed actively and 23.66% patients were managed expectantly. Incidence of expectant management is lower than other studies.^{12,14,15} Premature termination done in 09 cases due to recurrent haemorrhage. Most expectantly managed group delivered by caesarean section. Perinatal death was 13.64% among expectantly managed group which is lower than actively managed group (25.35%).

In this study, including two twin pregnancy 93 patient delivered 95 babies. Therefore 82.10% live birth, 9.47% still birth, 12.63% neonatal loss was recorded, which is lower than that of studies by Brenner (21.03%)¹² and Cotton(12.6%)¹⁵. Hibberd et al has showed that despite an increase utilization of caesarean section, prolonged expectant management, prolonged hospitalization and proper diagnosis, the foetal salvage in placenta praevia had not appreciably improved.²⁰ In this present series about one third patients came in labour with p/v bleeding or with shock. So, pregnancy have to be terminated irrespective of gestational age. This is likely the cause of increase incidence of perinatal mortality than others.

Birth weight, gestational age and prematurity were the dominant factor in perinatal mortality. In this study 69.23% perinatal mortality occur in those whose birth weight <1500 gm and 38.10% preterm birth weighing 1500-2000, whereas in term baby's whose birth weight >2500gm perinatal death occur only 4.35%. This study correlates with cotton et al¹⁵ showing that perinatal mortality reduced significantly with gestational age and weight of the newborn.

In this study 9.68 % patients required caesarean hysterectomy, 18.28% developed PPH, 3.22 % had bladder injury due to bladder invasion. This result more or less same as that of Zeba et al.²¹ This study recorded, one maternal death due to irreversible shock following massive haemorrhage. In this study, case fatality rate was 1.07%, which is lower than that of Brenner.¹² Zeba et al.²¹

CONCLUSIONS

This study showed that rate of placenta praevia in our hospital was 2.83%, Case fatality rate 1.07%, perinatal death 22.10% due to placenta praevia. It can provide only an idea about the situation in our country. Maternal and perinatal death associated with placenta praevia are almost prevented in developed countries because nutritional status, wide health coverage, adequate transportation and communication system, availability of trained personal, optimal antenatal and intrapartum care. In Bangladesh only 37% deliveries taking place at facility²². For placenta praevia we have to ensure institutional delivery. In hospital there should be provision for USG in obstetric dept. 24 hours presence of anesthesiologists, blood bank at all levels, neonatal unit and incubator facilities in every district & tertiary level hospitals. To overcome this unfortunate but mostly preventable outcome of placenta praevia, particular attention to be given to increase community awareness, decentralization of maternity service, effective health care planning like community clinic from grass route level to tertiary levels and well established referral system and lower rate of primary caesarean section.

LIMITATION

Within the period this study observed small number of study subjects. This study merely represents the community people. Many of the patient came with such moribund condition that time and scope for investigations were beyond the scope. Various maternal and foetal parameters were to be monitored clinically due to lack of sophisticated monitoring method. Causes of maternal and foetal death assumed from clinical findings without post mortem examination.

RECOMMENDATION

Regular ante natal care reduces the risk of complications by prior determination of blood group, prevention of anaemia, confirmation of diagnosis by USG. Proper diagnosis, early referral and expectant management of patients will reduce prematurity. Therefore, to ensure better foetal outcome and also to improve maternal outcome, the rate of primary C section have to be reduced and practice of contraception and vaginal delivery should be encouraged in.

REFERENCES

1. WHO | Trends in maternal mortality: 1990 to 2015 [Internet]. WHO. Available from: <http://www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2015>; page no12
2. Strategic Plan for Health, Population and Nutrition Sector Development Program (HPNSDP) 2011-2016. Dhaka, Bangladesh: MOHFW. Page no-8-9
3. Dutta DC, Basu G, Konar H. Caesarean section in placenta praevia in rural obstetric practice. *J Indian Med Assoc.* 1980 Nov 1;75 (9):176-9.
4. D'Angelo LJ, Irwin LF. Conservative management of placenta praevia: A cost-benefit analysis. *American Journal of Obstetrics and Gynecology.* 1984 Jun 1;149 (3):320-6.
5. Ananth CV, Smulian JC, Vintzileos AM. The association of placenta previa with history of cesarean delivery and abortion: A metaanalysis. *American Journal of Obstetrics and Gynecology.* 1997 Nov 1;177(5): 1071-8.
6. Tuzovi L, Djelmiš J, Iliji M. Obstetric Risk Factors Associated with Placenta Previa Development: Case-Control Study. *Croat Med J.* :6.
7. Frederiksen MC, Glassenberg R, Stika CS. Placenta previa: A 22-year analysis. *American Journal of Obstetrics and Gynecology.* 1999 Jun 1;180(6):1432-7.
8. Placenta previa: Effect of Age, Gravidity, Parity and Previous Caesarean Section - ProQuest [Internet]. Available from: <https://search.proquest.com/openview/672484015e97f41369318005d7be24f6/1?pq-origsite=gscholar&cbl=24743>
9. Taylor VM, Kramer MD, Vaughan TL, Peacock S. Placental previa in relation to induced and spontaneous abortion: a population-based study. *Obstet Gynecol.* 1993 Jul;82(1):88-91.
10. Iyasu S, Saftlas AK, Rowley DL, Koonin LM, Lawson HW, Atrash HK. The epidemiology of placenta previa in the United States, 1979 through 1987. *American Journal of Obstetrics and Gynecology.* 1993 May 1;168(5):1424-9.
11. Macafee CHG. Placenta Praevia—A Study of 174 Cases. *BJOG: An International Journal of Obstetrics & Gynaecology.* 1945;52(4):313-24.
12. Brenner WE, Edelman DA, Hendricks CH. Characteristics of patients with placenta previa and results of “expectant management”. *Am J Obstet Gynecol.* 1978 Sep15; 132(2):180-91.
13. Oyelese Y, Smulian JC. Placenta Previa, Placenta Accreta, and Vasa Previa. *Obstetrics & Gynecology.* 2006 Apr;107(4):927.
14. Silver R, Depp R, Sabbagha RE, Dooley SL, Socol ML, Tamura RK. Placenta previa: Aggressive expectant management. *American Journal of Obstetrics and Gynecology.* 1984 Sep 1;150 (1):15-22.
15. Cotton DB, Read JA, Paul RH, Quilligan EJ. The conservative aggressive management of placenta previa. *American Journal of Obstetrics and Gynecology.* 1980 Jan 1;137 (6):687-95.
16. Hossain GA, Islam SM, Mahmood S, Chakraborty RK, Akhter N, Sultana S. Placenta previa and it's relation with maternal age, gravidity and cesarean section. *Mymensingh Med J.* 2004 Jul;13(2):143-8.
17. Zhang J, Savitz DA. Maternal age and placenta previa: A population-based, case-control study. *American Journal of Obstetrics and Gynecology.* 1993 Feb 1;168 (2):641-5.
18. Khatun MR, Lina KN, Nahar SG. Frequency of Placenta Previa in Multigravida at Tertiary Care Hospital. *TAJ: Journal of Teachers Association.* 2012;25: 59-63.
20. Hibbard LT. Placenta previa. *American Journal of Obstetrics and Gynecology.* 1969 May 15;104(2):172-82.
21. Zeba D, Das SR, Biswas SK, Roy RK, Fattah A, Akter S. Risk Analysis of Placenta Previa in Subsequent Pregnancy with History of Cesarean Section: A Case Control Study in Faridpur Medical College Hospital. *Faridpur Medical College Journal.* 2015;10(2):52-4.
22. bangladesh.pdf [Internet]. [cited 2019 Oct 31]. Available from: <https://www.who.int/pmnch/knowledge/publications/bangladesh.pdf>. page 12