Original Article:

Maternal and perinatal mortality, morbidity and risk factor evaluation in ante partum hemorrhage associated with Placenta Praevia

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Abstract:

Objective: *To determine the maternal & perinatal morbidity and mortality associated with Placenta Praevia in Bangladesh. To assess the risk factors of antepartum hemorrhage associated with Placenta Praevia.*

Design: *A cross sectional observational hospital based descriptive study.*

Setting*: Obstetric inpatient units of two tertiary care teaching hospitals of Dhaka.*

Participants: *One hundred pregnant mothers with diagnosis or Placenta Praevia proven by pelvic ultra sonography presenting with ante partum hemorrhage .*

Outcome: *Incidence of maternal and fetal morbidity and mortality and risk factors of ante partum hemorrhage in Placenta Praevia.*

Results: *38% study mothers had no ante natal care. There was no maternal death. 96% of mothers were delivered by Caesarean Section. Incidence of primary post partum hemorrhage was 38%. There were 21% still birth and 16% neonatal death. 47% mothers had no complication after delivery. 22% mothers presented with hemorrhagic shock. 59% delivered babies had birth weight below 2.5 kg and 55% delivered babies had no complication. 57% mothers belonged to low socio economic group.*

Conclusion: *The study reflects status of mothers presenting with Placenta Praevia with perinatal morbidity and mortality in a small urban population of Bangladesh treated at two tertiary care hospitals of Dhaka. It is recommended that mothers with Placenta Praevia need to have access to prenatal care and at the same time need to be educated about the benefit of prenatal care . Emergency management of ante partum hemorrhage with hemorrhagic shock should be widely available to improve the outcome of Placenta Praevia in our population.*

Key Words: *Ante Partum Hemorrhage, Placenta Praevia, Maternal Mortality, Maternal Morbidity*

Introduction

Ante partum hemorrhage (APH) is one of the most ominous complications of pregnancy. The seriousness & frequency of massive obstetric hemorrhage make it one of the leading cause of maternal death & also a major cause of prenatal morbidity & mortality.[1,2]

APH is defined as bleeding from or into the genital tract after 28th week of pregnancy but before the birth of the baby.[3] APH may be due to Placenta Praevia or placental abruption or the cause may be unexplained. About 35% cases of APH are due to Placenta Praevia and almost equal number of cases are due to placental abruption.[3]

By definition Placenta Praevia refers to the condition when the placenta is implanted partially or completely over the lower uterine segment. Any patient who reports a significant amount of painless and apparently causeless bleeding during last trimester of pregnancy must be considered to have Placenta Praevia unless proven otherwise.

Women with history of one Caesarean delivery are 2.6 times and women with history of one abortion are 1.6 times more likely to develop Placenta Praevia in a subsequent pregnancy.[15]

The incidence of APH ranges from 0.51% among hospital deliveries and usually high in developing countries.[3]

Placental abruption is the premature separation of a normally situated placenta. This results in mild to moderate or severe per vaginal bleeding which is painful in nature. Exact cause is not known but may be due to folic acid deficiency, trauma, version or pre eclamptic toxaemia etc. [3-6,11,12]

The predisposing factors, which can increase the risk for developing Placenta Praevia, are advanced maternal age (more than 35years), multi parity, multiple gestation, maternal cigarette smoking and use of cocaine, prior Caesarean Section (C/S) and uterine curettage done with sharp curette following spontaneous or induced abortion.[3,21]

In Bangladesh APH is a grave obstetrical emergency and the risk factors for APH include poor antenatal check-up, illiteracy, hazardous transportation, restricted medical and surgical facilities and poor socioeconomic conditions etc.

Mortality and morbidity in APH are due to hypovolemic shock, anemia, multi organ failure, disseminated intra vascular coagulation(DIC), blood transfusion related

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complications and hysterectomy which also leads to loss of child bearing potential . There is a significant correlation between the gestational age at which the bleeding episode starts and occurrence of preterm delivery.

Materials And Methods

A cross sectional observational hospital based descriptive study was conducted in in-patient units of department of Obstetrics and Gynecology of two tertiary care teaching hospitals of Dhaka namely Dhaka Medical College Hospital (DMCH) & Bangladesh Medical College & Hospital (BMCH) from August 1, 2010 to January 31, 2011.

A total of 354 cases of APH were identified in these study hospitals' obstetric in patient units by going through the hospital admission records following their admissions . Out of them 140 patients were diagnosed clinically to have Placenta Praevia confirmed by pelvic ultra sonography after admission or by pre admission pelvic ultra sonography. Out of the 140 Placenta Praevia cases 100 mothers who fulfilled the inclusion and exclusion criteria were randomly chosen for the study .

Inclusion Criteria: Mothers who fulfilled diagnosis of APH associated with Placenta Praevia clinically and confirmed by pelvic ultra sonography and admitted into obstetric inpatient units of DMCH & BMCH.

Exclusion criteria: Patient with Placenta Praevia associated with pre eclampsia and eclampsia, accidental multiple trauma, physical assault on the abdomen, external version and amniocentesis. Mothers with Placenta Praevia but with co morbid conditions like bleeding disorders, insulin dependent Diabetes Mellitus, Gestational Diabetes Mellitus, acquired heart diseases or congenital heart diseases were also excluded from the study.

Data Collection and statistical analysis:

Before data collection informed consent were taken from study patients or her attendants. Permission was taken from ethical review committee of the hospital before beginning data collection. Data were collected prospectively using preprinted case report forms and it included demographic data and questionnaire. The data documented identification of the patient, brief history, general physical examination, systemic examination, investigations and treatment histories and diagnoses as per questionnaire. Descriptive analysis was performed. Categorical and qualitative data were easily expressed as frequency with corresponding percentage as the total number of study patients was 100. Continuous variables were analyzed to determine mean±standard deviation (SD) using SPSS version 15. P value was not calculated to assess the level of statistical significance.

Results:

7980 patients were delivered as per admission records of obstetrics inpatient units of DMCH & BMCH from August 1 , 2010 to January 31, 2011. The total number of APH cases during this period was 354, with an incidence of 4.4% among all the delivery cases. There were 140 patients of Placenta Praevia, so correspondingly incidence of Placenta Praevia was 1.8%. There were also 90 cases of placental abruption. Out of these cases of Placenta Praevia,100 cases were selected for the study by simple random sampling .

96 study mothers with Placenta Praevia out of 100, belonged to age range of 20 years to 40 years (Table 1).

Table I :

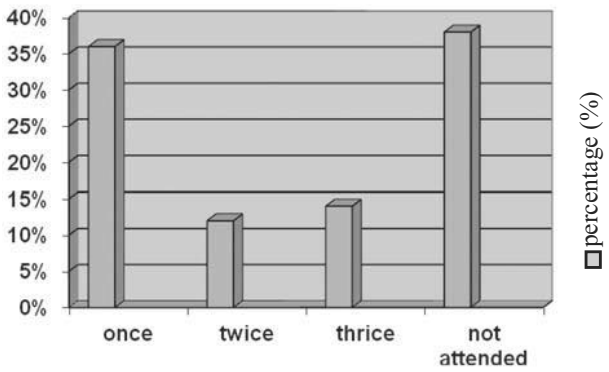
Distribution of age of the study patients (n = 100)

Maternal age group (years)	Frequency	Percentage %
20-29	44	44%
30-39	52	52%
> 40	04	4%
Mean age	32.4 years	
Standard deviation	± 5.6 years	

Significant prenatal history showed that 36 study mothers had only once prenatal check up and 38 study mothers never had any ante natal care. (Fig 1)

Figure I :

Patients attended antenatal checkup



Majority (78%) of study patients had one episode of vaginal bleeding. But 12% and 10% of patients had two and more episodes of bleeding respectively before being admitted.

Most of the patients (57%) belonged to lower socio-economic condition and had monthly family income ranging 5000/- to 10000/- taka . Vast majority of the mothers (96%) had two or more gravida by history, Out of them 56% of were in 2nd or 3rd gravida and 40% were in 4th or in higher gravida by history. 43% study mothers did not have any identifiable risk factors. 26 and 22 study mothers had past history of abortion and C/S respectively.(Table II)

Table II:

Association of risk factors with ante partum haemorrhage

History of Risk factors	Frequency	Percentage %
Abortion	26	26%
Previous APH	05	5%
C/S	22	22%
MR**/ D & C*	04	4%
No risk factors	43	43%

**Menstrual Regulation procedure. *Dilation and curettage

22 mothers presented with hypovolaemic shock associated with hemorrhage at some point after admission and rest of the patients were stable after admission. 58% mothers were found to be moderately anemic. 93 mothers underwent C\S and 4 mothers had Caesarean hysterectomy because of intractable bleeding and 3 mothers were delivered normally. 63 babies (all single pregnancies) were born alive and there were 21 still births and 16 neonatal deaths. 52 pregnancies did not present with any fetal morbidity (Table III).

Table III :

Fetal outcome in Placenta Praevia

Fetal outcome	Frequency	Percentage %
Stillborn	21	21%
Neonatal death	16	16%
Sepsis after delivery	02	2%
Asphyxia	03	3%
Jaundice	05	5%
RTI	01	1%
No Morbidity	52	52%

It was also found that 53% delivered babies out of total 79 live new born had birth weight below 2.5 Kg (table IV)

Table IV:

Birth weight of the babies after delivery (n = 79).

Birth weight (kg)	No. of the babies	Percentage %
<1.5	02	2.5%
1.5-1.9	12	15.2%
2.0-2.4	28	35.4%
2.5-2.9	34	43.1%
3.0-3.4	03	3.8%

All mothers were followed till discharge. 47 mothers were discharged healthy and had no significant complications after delivery. 38 mothers suffered from primary post partum hemorrhage (PPH). (Table V)

Table V:

Complications in the study mothers after delivery (n= 100)

Complications after delivery	No. of the patients	Percentage %
Primary PPH	38	38%
Disseminated Intravascular Coagulation	02	2%
Acute kidney injury	01	1%
Puerperal sepsis	06	6%
Wound Dehiscence	01	1%
Urinary tract infection	05	5%
No Complication	47	47%

Discussion

APH associated with Placenta Praevia is one of the significant obstetric hazards contributing to maternal death and perinatal loss in developing countries. With the advent of advanced care, delivery of a healthy baby is possible without significantly jeopardizing the safety of the mother. Now days progress have been made in our country in terms of improvement of the outcome of the mother and the baby. This have been made possible by the use of ultra sonography for diagnosis, modern technique of C/S, availability of blood and blood products, fetal lung maturity therapy, availability of neonatal intensive care for underweight new born, management of hypovolaemic shock for mothers, modern method of anesthesia and introduction of new generation antibiotics etc.

In Bangladesh in spite of these progresses, antenatal care has been scarce and inadequate especially in some part of rural areas. In cities like Dhaka, patients generally report to the emergency department for the first time, with moderate to severe degree of per vaginal bleeding. Hence the outcome of pregnancy results in a very poor outlook, not only for the mother but also for the fetus.

In our study, the incidence of APH among all the deliveries was 4.4% and Placenta Praevia was 1.8% (1 in 57 deliveries). Bhatt SM[14] reported the incidence of placenta praevia to be 0.5% of all pregnancies in a referral hospital in Oman. In USA, Ananth CV[15] reported the incidence of Placenta Praevia to be approximately 1 in 200 deliveries. Taylor MV et al[28] reported that the frequency of placenta praevia among women of Asian origin was 3.3 per 1000 live birth (0.33%). In one study in United States, from 1979

through 1987, Placenta Praevia was found to complicate 4.8 per 1000 deliveries (0.48%) annually.[17] In two studies from Bangladesh, Bilkis M[24] and Forhad QE[25] reported that the incidence of Placenta Praevia were 2.2% and 2.58% respectively. The incidence of Placenta Praevia is reported to be higher in developing countries[24,25] than in the western world[3,14,15,17.] In our study, the incidence of Placenta Praevia was higher (1.8%) than other developing countries. This is explained by the fact that the study hospitals in our study were tertiary referral hospitals for complicated pregnancies.

Risk of Placenta Praevia increases dramatically with advancing maternal age. Its occurrence is increased with rising maternal age and is reported in literature to be the highest in women aged 35 years or older (0.8% of all deliveries) and the lowest in women aged < 25 years(0.07%).[19]

In our study, the mean age of the patients was 32.4 ± 5.6 years (range between 20 & 46 years). Majority of the patients (52%) belonged to 30-39 years age group. Khashoggi T[21] Brenner WE et al,[10] and Bhatt SM[14] reported the mean maternal age for Placenta Preavia to be 27.6 years, 28.3 years and 30.6 years respectively.

Incidence of Placenta Praevia in women with previous deliveries was significantly higher compared to primiparous group. Multiparity appeared to increase the occurrence of Placenta Praevia.[19]

In our study mean parity for occurrence of Placenta Praevia was approx 3.4. Khashoggi T[21] and Brenner WE et al,[10] and Bhatt SM[14] reported mean parity to be 2.7 and 2.3 and 4.7 respectively.

There is a strong association between having a previous Caesarean delivery or spontaneous/induced abortion, and the subsequent development of Placenta Praevia.[15] Among women with Placenta Praevia, an increasing number of prior Caesarean deliveries are associated with increased maternal morbidity.[20]

Women with at least one Caesarean delivery are 2.6 times more likely to develop Placenta Praevia in a subsequent pregnancy. Women with a history of spontaneous abortion has 1.6 times relative risk of developing Placenta Praevia, while those with a history of induced abortion has a relative risk of 1.7.[15]

In our study, Placenta Praevia was associated with past history of C/S (22%) and previous abortion (26%). Brenner WE et al,[10] Bhatt SM,[14] Khashoggi T[21], Mahmood S[27] Bilkis M[24] Forhad QE[25] reported 11.2%, 6%, 15%, 15%, 11% and 1.1% incidence of prior C/S respectively in patients with Placenta Praevia. The same group of authors reported 35.1%, 15%, 30%, 27%, 41% and 23.9% incidence of spontaneous or induced abortion respectively in mothers with Placenta Praevia.

Studies[24, 25] have shown that there is a strong association between antenatal check up and perinatal deaths. 38% of our study patients never had any antenatal check up and 36% of our study patients had only one antenatal checkup. 57% of our study mothers belonged to poor socio economic group (monthly family income ranged between taka 5000 and 10000). Adequate antenatal care is necessary to improve the maternal health. Correction of anemia can be undertaken during antenatal visit so that the patients can withstand blood loss during APH. Often family planning advice during the period of antenatal checkup help limit number of births thereby reducing the incidence of Placenta Praevia. Thus antenatal checkup has an important bearing on reducing the incidence and the risk of Placenta Praevia and thereby reducing chance of maternal morbidity, mortality and fetal loss.

78% of our study patients had one episode of vaginal bleeding before admission. In Bangladesh mothers are often referred to hospital after multiple or severe bleeding. Two Bangladeshi authors [24,25] reported 53% and 70% of their study patients having two or more episodes of vaginal bleeding respectively. 22% of our study patients presented with hemorrhagic shock. One Bangladeshi author[27] reported 26% incidence of hemorrhagic shock among his study patients.

Perinatal mortality rates are lower with caesarean delivery for every type of Placenta Praevia. Vast majority of our study patients (97%) had Caesarean deliveries and, only 3% of patients had vaginal delivery. C/S has now become the method of choice for delivery in Placenta Praevia and C/S has proved to be the important factor in lowering maternal and perinatal mortality reported in one study.[2]

In our study 21 mothers with Placenta Praevia had still births.Two Bangladeshi authors[24, 27] reported 20.5% and 19% incidence of perinatal death among their study patients. Where as Khashoggi T[21] and Brenner WE[10] reported 4.16% and 21.3% perinatal mortality rate among their patients respectively.

Low birth weight was a significant finding among all the live births (n=79) in our study and 59 % live births had birth weight below 2.5 kg. This was similar to finding of low birth weight (67%) in another Bangladeshi study.[24]

In our study none of the study patients died. In western countries maternal mortality from APH associated with Placenta Praevia is rare.[21] However three studies[24, 25, 27] from Bangladesh reported 2% maternal mortality in each of them. Our study sample size was small and this could be the reason for zero maternal mortality. A policy of confinement in the hospital, blood transfusion in the antenatal period and C/S as the exclusive mode of delivery at maturity probably eliminated the risk of maternal mortality in our study.

But significant number of mothers (38%) in our study had primary post partum hemorrhage which could have been life threatening without confinement in hospital.

Conclusion

This study was undertaken primarily to find out the maternal and fetal mortality and morbidity associated with Placenta Praevia and their relationship with different risk factors.

93 out of 100 study patients had C/S and they were all managed by blood transfusion as needed and a team of experienced obstetrician, anesthesiologist and neonatologist attended the procedures. It is concluded that these APH patients without prenatal check up and with possible delayed presentation, presented with compromised fetal condition and maternal hemorrhagic shock, leading to still births (some them could have intrauterine fetal deaths). High number of neonatal deaths could have been contributed by low birth weight of fetus. Our study was done in two major urban tertiary care hospitals where maternal mortality was prevented by good management facilities but poor fetal outcome could not be prevented because of possible reasons mentioned earlier. It is hypothesized that poor socioeconomic condition among mothers and lack of awareness of the importance of ante natal check up were responsible for poor ante natal care among mothers. These in turn are responsible for high number of perinatal death. Our study reflects the status of segments of mothers of a small population of not so well defined demographic back ground and does not reflect the overall picture of the whole country. We need a much larger study involving wide range of demographic parameters and involving a much larger segment of population with hospitals & outpatient services of different categories from urban, semi urban and rural areas. Such large scale study will enable us to assess the status of care of these mothers suffering from Placenta Praevia and outcome of care received by them across the country. Such study will also enable us to take appropriate nationwide plans to treat and care for these mothers suffering from APH associated with Placenta Praevia and other conditions causing APH. Such measures if undertaken will significantly reduce the maternal and perinatal morbidity and mortality of APH in Bangladesh.

Limitations Of The Study

The biggest limitation of this study is the small number of study population (n= 100). The demographic characteristics like variable socio economic conditions (in addition to monthly family income), accessibility and awareness of importance of antenatal care etc were not addressed in this study population. Although 57% mothers from low income family had Placenta Praevia, it was not determined if this group of mothers had inadequate prenatal check up.

Availability of prompt resuscitation of hemorrhagic shock in the emergency room of the study hospitals and availability of emergency ultra sonography facility and emergency C/S round the clock in the study hospitals were not addressed in our study.

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