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Pregnancy Outcomes in Patients with Bleeding in First Trimester

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Abstract

Aim: To study the relationship of first trimester maternal bleeding with its effect on fetal and maternal outcomes.

Methods: A case control study was performed on 250 pregnant women in department of obstetrics and gynaecology in st. stephens hospital, New Delhi. Subjects were divided into two groups: 1) bleeding in first trimester as cases 2) no bleeding in first trimester as control. Patients were followed up until delivery and each materno-fetal complication was registered.

Results: First trimester bleeding was associated with increased risk of preterm delivery, placenta previa, pregnancy induced hypertension/preeclampsia (PE), Low Birth Weight (LBW) and Neonatal Intensive Care Unit (NICU) admission. In our study most common antenatal complication observed in both case and control groups was Premature Rupture of Membranes (PROM), seen in 33.6% (n=42) and 13.6% (n=17) respectively which is statistically highly significant (p<0.001). Other complications observed were preterm labour, Preterm Premature Rupture of Membrane (PPROM), antepartum hemorrhage, preeclampsia and gestational hypertension and Intrauterine Growth Restriction (IUGR). Outcome of pregnancy in the two groups is shown in table 3. Incidence of Emergency Cesarean section was found to be 57.6% in case group and 19.2% in control group, which was statistically significant (p<0.001). Complications observed were Postpartum Hemorrhage (PPH), retained placenta, need of blood transfusion and ICU care. However none of them were statistically significant.

Conclusion: Our study suggests that bleeding in the first trimester is correlated with an increased incidence of late-pregnancy and perinatal complications and, therefore, these pregnancies should be considered as high risk ones.

Keywords: Antepartum haemorrhage; First trimester bleeding; Pregnancy; Preterm delivery

Introduction

First trimester bleeding is a common complication of pregnancy with an incidence of about 20-25%. Threatened miscarriage is diagnosed on the basis of documented fetal cardiac activity on ultrasound with history of vaginal bleeding in presence of closed cervix. Bleeding during pregnancy may be associated with poor fetal and maternal outcomes. About half of these will end up in miscarriage within 20 weeks of pregnancy. Those who remain pregnant have an increased risk of developing complications later in pregnancy [1]. It is hypothesized that first trimester bleeding may indicate an underlying placental dysfunction which may manifest later in pregnancy as an increased risk of pre-eclampsia, preterm delivery, premature rupture of membrane, placental abruption and intrauterine growth restriction, antepartum hemorrhage, manual removal of placenta and Caesarean section. Women with first trimester vaginal bleeding in whom pregnancy continues, have nearly 3 times risk of preterm birth between 28-31 weeks as compared to women without bleeding. Women with first trimester vaginal bleeding in whom pregnancy continues, have nearly 3 times risk of preterm birth between 28-31 weeks as compared to women without bleeding. Local formation of thrombin and soluble fms like tyrosine kinase-1 (sFlt-1) seems to be involved in the development of placental abruption and pre eclampsia where pregnancy continued beyond first trimester. Vaginal bleeding and consequent thrombin generation lead to a proteolytic cascade capable of damaging the fetal membranes, which could result in preterm premature rupture of membrane. Thrombin also stimulates uterine contraction which promotes preterm labour. Bleeding could also be a manifestation of sub clinical or occult infection or inflammation in uterus which in turn is hypothesized to cause spontaneous preterm birth presenting as preterm premature rupture of membrane and preterm labour. Overall, threatened miscarriage can generate great anxiety in patients, especially because bleeding in early pregnancy can lead to pregnancy loss and other obstetric complications. Knowledge about outcome of ongoing pregnancies following first trimester bleeding is relevant to both women and their obstetrician in order to plan their antenatal care and to consider clinical interventions in pregnancy [2].

Materials and Methods

Aim

To study the relationship of first trimester maternal bleeding with its effect on fetal and maternal outcomes.

Objectives

To evaluate maternal outcomes as:

- Preterm delivery (delivery before 37 completed weeks).
- Pre-eclampsia/eclampsia.
- Antepartum hemorrhage (placenta praevia/abruption or any other hemorrhage).
- Preterm premature rupture of membranes.
- Mode of delivery (instrumental/Caesarean section).
- Postpartum hemorrhage.

To evaluate fetaloutcomes as :

- Fetal malformations
- Low birth weight (birth weight less than 2.5 kg).
- Intrauterine growth restriction.
- Perinatal mortality.
- Perinatal morbidity/Neonatal complications: Apgar score, NICU admission, Hypoxic ischaemic encephalopathy, necrotizing enterocolitis.

The study was conducted in the Department of Obstetrics andGynaecology, St. Stephen's Hospital, New Delhi Study was conducted in two groups: 125 pregnant women with vaginal bleeding in first trimester as cases and 125 pregnant women with no history of bleeding in first trimester as controls.

Inclusion criteria

Pregnant women with singleton pregnancy presenting to St. Stephens's Hospital with complaints of spotting per vaginum or bleeding per vaginum in first trimester of pregnancy with fetal cardiac activity confirmed by ultrasound [3].

Exclusion criteria

- First trimester bleeding which ended up in complete, incomplete or missed abortion in first trimester itself.
- Women opting for termination
- Women with multiple pregnancies
- Hydatidi form mole.

Estimated sample size was based on maternal and neonatal morbidity. Sample size of 125 was needed in each of two groups for a case control study to be 95% confident and power of 80% of estimating the NICU admissions. Odd's ratio which was believed to be in the vicinity of 3.0 and exposure rate among control was estimated to be 5%. The study design chosen to study the correlation of the first trimester bleeding with feto-maternal outcome was case control study. Patients were recruited from gynaecology OPD/casuality. Informed consent was taken. Detailed obstetric history was taken including timing and intensity of bleeding. General physical examination for detection of pallor, icterus, recording of pulse and blood pressure was done. Obstetric examination was carried out including per abdomen examination, per speculum and per vaginum examination and noted in the proforma used for study.Baseline investigations were conducted. USG for gestational age, fetal viability, placental localization was done at first complaint of bleeding per vaginum in first trimester of pregnancy. Patients of threatened abortion who recoverd were followed up antenatally till one week post-delivery. Women were followed up fortnightly from 6th month of pregnancy and weekly in 9th month of pregnancy. Ultrasound was performed in all enrolled women at 18-20 weeks and 34 to 36 weeks of gestation. Consequences of pregnancy were evaluated by close observation on progress and antenatal care. All observations noted were subjected to statistical analysis [4]. Statistical testing was conducted with the statistical package for the social science system version SPSS 17.0.continuous variables will be presented as mean +/-SD or median if data is unevenly distributed. Categorical variables were expressed as frequencies and percentages. The comparison of normally distributed continuous variables between the groups were conducted using student's T test Nominal categorical data between the groups were compared using chi-square test or fisher's test as appropriate. Non normal distribution continuous variables were compared using mannwhitney u test. Odds ratio, 95% CI was also calculated for factors associated with cases. For all statistical tests, p value<0.05 was taken to indicate a significant difference.

Results

Demographic profile of study group

The patients were divided into two groups:

Group A: Case group-125 patients with history of spotting per vaginum or bleeding per vaginum in first trimester of pregnancy

Group B: Control group-125 patients without history of bleeding or spotting per vaginum

Both groups were monitored from first trimester of pregnancy till one week postpartum (**Table 1**).

	Case group	Control group	p value
	Mean ± SD	Mean ± SD	
Age	28.28 ± 3.44	27.57 ± 3.62	0.116
Weight	62.09 ± 8.93	60.98 ± 4.33	0.212
Height	160.02 ± 5.85	159.30 ± 4.47	0.276
BMI	24.25 ± 3.23	24.04 ± 1.58	0.513

Table 1: Demographic profile of the study group.

The patients of 2 groups did not have any significant differences according to age, weight, height or Body Mass Index (BMI). Mean age for the cases and controls were 28.88 years and 27.67 years respectively. Mean BMI for cases and controls were 24.25 years and 24.04 years respectively [5]. The patients of 2 groups did not have any significant differences according to age, weight, height or Body Mass Index (BMI). Mean age for the cases and controls were 28.88 years and 27.67 years

respectively. Mean BMI for cases and controls were 24.25 and 24.04 respectively (**Figure 1**) [6].

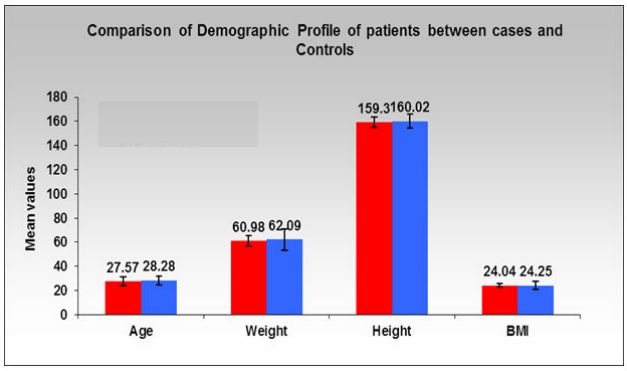

Figure 1: Demographic pro ile of the study group. Note: Case Group, Control Group.

History of bleeding per vaginum in previuos pregnancy (**Table 2**).

Past history of bleeding per vaginum inprevious pregnancy	Cases	Controls	P Value
No	0.84	1	<0.001
Yes	0.16	0	

Table 2: History of bleeding per vaginum in previous pregnancy.

16% Patients in case group whereas 0% patients in control group had history of bleeding per vaginum in previous pregnancy which was statistically significant (**Figure 2**) [7].

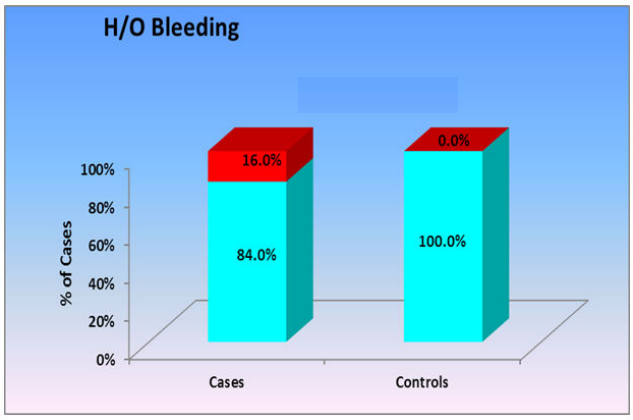

Figure 2: Past history of bleeding per vaginum in previous pregnancy. Note: Yes No

Clinical presentation

Period of gestation: Patients in the case group had bleeding per vaginum between 6 weeks-12 weeks. Mean gestational age at bleeding per vaginum was 9 week (**Table 3**).

History of present pregnancy	Cases		
Gestational age at bleeding per vaginum or spotting per vaginum	Mean ± SD	Median	Min-Max
	8.90 ± 1.69	9	6.0-12.00

Table 3: Period of gestation.

Intensity of bleeding: The number of patientsin study group presenting with bleeding per vaginum were 68 (54.4%) whereas those presenting with spotting per vaginum were 57 (45.6%). (Pictographically demonstrated in table 2 and figure 2) (**Table 4, 5**).

Intensity of bleeding	Case group
Bleeding per vaginum	68 (54.4%)
Spotting per vaginum	57 (45.6%)

Table 4: Intensity of bleeding.

Ultrasonographic findings

Ultrasonographic findings	Cases	Controls
Fetal viability	125 (100%)	125 (100%)
Intrauterine hematoma	59 (47.2%)	0 (0%)

Table 5: Presence of intrauterine hematoma.

Comparison of pregnancy outcomes between two groups

Antenatal complications: In our study most common antenatal complication observed in both case and control groups was Premature Rupture of Membranes (PROM), seen in 33.6% (n=42) and 13.6% (n=17) respectively which is statistically highly significant (p<0.001) [8]. Other complications observed were preterm labour, Preterm Premature Rupture of Membrane (PPROM), antepartum hemorrhage, preeclampsia and gestational hypertension and Intrauterine Growth Restriction (IUGR) (**Table 6** and **Figure 3**).

Antenatal complications	Case group	Control group	p value
Preterm labour	16 (12.8%)	11 (8.8%)	0.308
Pprom	4 (3.2 %)	1 (0.8%)	0.175
prom	42 (33.6%)	17 (13.6)	<0.001
Antepartum hemorrhage	4 (3.2%)	1 (0.8%)	0.37
Preeclampsia and gestational hypertension	22 (17.6%)	16 (12.8%)	0.46
IUGR	14 (11.2%)	11 (8.8%)	0.527

Table 6: Different antenatal complications.

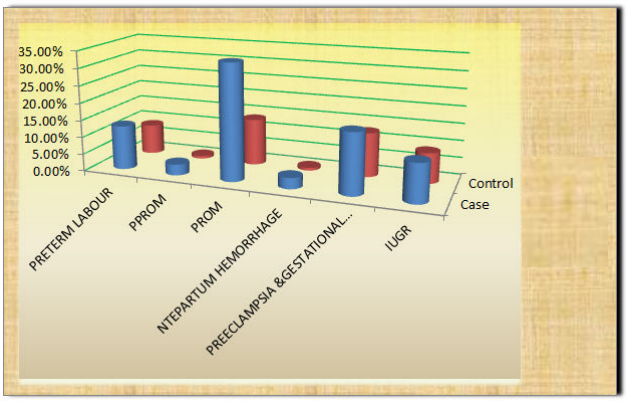

Figure 3: Comparison of antenatal complications. Note: Case Control.

Mode of delivery: Outcome of pregnancy in the two groups is shown in table 3.Incidence of Emergency Cesarean section was found to be 57.6% in case group and 19.2% in control group, which was statistically signi icant (p<0.001) (**Tables 7 and8 Figures 4 and 5**).

Mode of delivery	Case	Control	p value
Normal delivery	38 (30.4%)	96 (76.8%)	<0.001
Instrumental delivery	9 (7.2%)	4 (3.2%)	0.254
Elective cesarean	6 (4.8%)	1 (0.8%)	0.12
Emergency cesarean	72 (57.6%)	24 (19.2%)	<0.001

Table 7: Mode of delivery.

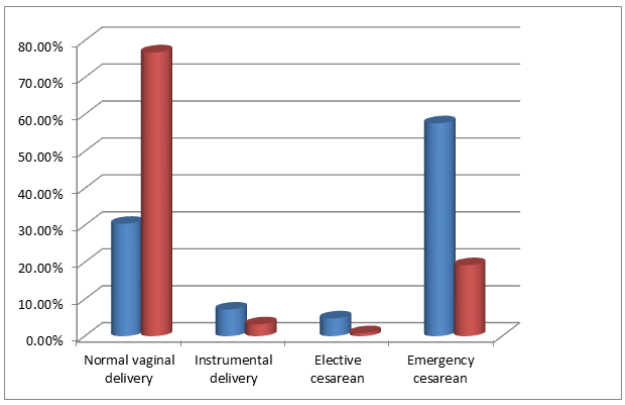

Figure 4: Comparison of mode of delivery. Note: Case Control.

Postpartum complication	Case	Control	p value
Postpartum hemorrhage	15 (12%)	8 (6.4%)	0.365
Retained placenta	4 (3.2%)	0 (0%)	1.222
Need of blood transfusion	10 (8%)	6 (4.2%)	0.301
Need of icu care	1 (0.8%)	0	1

Table 8: Postpartum complications.

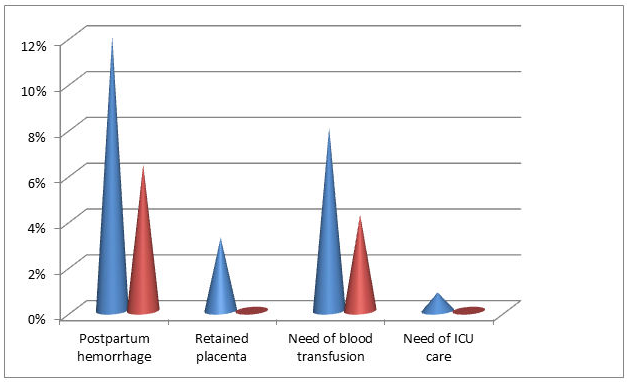

Figure 5: Comparison of postpartum complications between case and control group. Note: Case Control.

Fetal and neonatal complications: In our study most common complication observed was low birth weight (28% in cases and 19.2% in controls respectively). However this difference was not statistically signi icant (**Tables 9 and 10**).

Complications	Case group	Control group	p value
Preterm birth	28 (22.4%)	17 (13.6%)	0.07
Low birth weight	35 (28%)	24 (19.2%)	0.101
Still birth	1 (0.8%)	0 (0%)	1
Nicu admission	22 (17.6%)	18 (14.4%)	0.49
Perinatal mortality	2 (1.6%)	0	0.498
Congenital malformation	0	0	

Table 9: Comparison of fetal and neonatal complications.

	Cases	Controls	P Value
	Mean ± SD	Mean ± SD	
Apgar at 5 minutes	8.70 ± 0.66	8.90 ± 0.38	0.005

Table 10: Comparison of apgar score.

Discussion

The present study was conducted on two groups, 125 cases who had complaints of bleeding or spotting per vaginum in first trimester and 125 controls who had no such complaints. The two groups were comparable with regard to sociodemographic profile. Mean age for the cases and controls were 28.88 years and 27.67 years respectively. Mean BMI for cases and controls were 24.25 and 24.04 respectively. 81.6% patients in case group and 87.2% patients in control group belonged to middle class. Maximum patients in both groups belonged to parity 1 (82.4% in cases and 83.1% in controls) In our study, there was past history

of bleeding per vaginum in their prior pregnancies in 16% of cases, however there was no such history in control group and this finding was statistically significant (p<0.001). There were limited studies on record of such histoy. Past history of bleeding in previous pregnancies in 33.3% of cases. Our study was focused on comparing the outcomes of pregnancy, mode of delivery and postpartum period in the two groups. Fetal outcomes were also studied [9].

In our study, number of preterm labour was 16 (12.8%) in case group and 11 (8.8%) in control group, but it was not of statistical significance (p=0.308). This is consistent with few other studies, which failed to show association of preterm labour with threatened miscarriage that incidence of preterm delivery among cases was higher than controls, but this increase was not statistically significant (p<0.9). Significantly increased risk of preterm labour among women with first trimester vaginal bleeding (p=0.001 and p ≤ 0.05 respectively).

In our study, incidence of Preterm Premature Rupture of Membrane (PPROM) was more in case group as compared to control group 4 cases (3.2%) *vs*. 1 case (0.8%). This difference was not statistically significant (p=0.175). There was no significant difference between 2 groups with regard to preterm pre labour rupture of membranes, whereas Evernos it is found significantly higher incidence of PPROM in threatened miscarriage group.

In present study, number of patients with Premature Rupture of Membrane (PROM) in case group was 42 (33.6%) whereas in control group was 17 (13.6%). The difference in PROM between two groups was statistically highly significant (p<0.001). There was significantly higher incidence of PROM in threatened miscarriage group as compared to control group (p<0.001). Statistically significant (p=0.02 and p=0.016 respectively) increased incidence of PROM among case group as compared to control group.

This is consistent with the fact that bleeding into the decidua leads to thrombin generation causing activation of proteolytic cascade and also chronic inflammation, both of which results in weakening and eventual rupture of membranes and increased myometrial activity which eventually leads to premature rupture of membranes and preterm labour [10].

4 patients in case group, 2 of which were placenta praevia and the other two were abruption placentae and 1 patient in control group which was placenta praevia, had antepartum hemorrhage. This was not statistically significant (p=0.370). Similarly, no difference among two groups with regard to placenta praevia and abruption of placenta. In contrast, higher incidence of placenta praevia or APH of unknown origin.

We found that Incidence of preeclampsia and gestational hypertension were more in case group as compared to control group but this difference was not statistically significant (p=0.460). No difference between two groups with regard to preeclampsia, Preeclampsia was significantly more common in subjects with threatened miscarriage.

Statistically insignificant result was found with regard to intrauterine growth restriction of fetus in the two groups as case group had only 2.4% high incidence as compared to control group (p=0.527). Threatened miscarriage did not increase risk of IUGR but neonatal weight in babies born of women with threatened miscarriage was lower. Significant association between first trimester bleeding and IUGR.

In our study, number of patients who had cesarean section in case group was 78 (72 emergency CS and 6 elective CS) whereas in control group it was 25 (24 emergency CS and 1 elective CS). Common indications for cesarean section in case group were fetal distress and nonprogress oflabour. The number of patients with vaginal delivery in case group were 47 (38 normal vaginal and 9 instrumental) whereas in control group were 100 (95 normal, 1 breech vaginal and 4 instrumental). The difference in mode of delivery between two groups was statistically significant (p<0.001) with high incidence of Cesarean section in case group. High incidence of Cesarean section with threatened miscarriage. Higher incidence of elective Cesarean delivery among study group. In their study risk of instrumental delivery or Cesarean section were not significantly altered.

Conclusion

In conclusion, it seems that vaginal bleeding in the first trimester of pregnancy increases the risk of some complications like premature rupture of membranes and caesarean section, both of which were found to be highly significant. Certain other complications were also found to be higher like preeclampsia and gestational hypertension, preterm birth, low birth weight and hence increased NICU admission. Larger population based studies need to be done in this regard for better correlation of these findings and better formulation of strategies to decrease adverse outcome in such patients.

Women with vaginal bleeding in the first trimester of their pregnancy have higher risk of unwanted pregnancy outcomes and therefore require better care and consultation. Also this is a warning sign for health care professionals to consider such cases as high risk pregnancies and treat them accordingly or if required, to timely refer them to better equipped medical centers to reduce the risk of these complications.

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