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Impact of First Trimester Bleeding on Feto-Maternal outcome : A cohort Study in A Tertiary Care Hospital of Eastern India

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Abstract

Background: To evaluate the impact of first trimester bleeding on maternal and perinatal outcomes in pregnancies that crossed period of viability. Threatened miscarriage is presumed to be associated with adverse maternal and perinatal outcome which needs to be systematically evaluated and documented.
Methods: A prospective cohort study having 100 participants where pregnancy outcomes were compared between 50 patients with threatened miscarriage [TM] and 50 uncomplicated controls. Baseline demographic and clinical history were recorded to make the two arms comparable. Maternal outcomes in terms of antepartum haemorrhage [APH], preeclampsia, preterm labour, operative morbidity due to caesarean section and neonatal outcomes including low birth weight (LBW), prematurity and perinatal death were compared among case and control groups.
Result: APH was 5.75 fold increased among cases (P=0.0001). LBW was more prevalent among babies born to the mothers with pregnancies complicated with first trimester vaginal bleeding (*p*-value=0.0001).
Conclusion: Threatened miscarriage should be considered as high risk pregnancy requiring frequent antenatal visits and timely referral to higher centres when complications are identified.

Key Words: ***Threatened miscarriage, Preterm Labour, First trimester bleeding***

INTRODUCTION

Threatened miscarriage (TM) is the most common non traumatic cause of first trimester bleeding with a prevalence rate of 20 percent[1]. It is a Provisional Diagnosis in pregnant women having vaginal bleeding or spotting, the cervical os remaining closed, and a detectable cardiac activity in embryo or fetus on ultrasound examination[2]. Approximately 90-96% of pregnancy with TM at 7-11 weeks period of gestation (POG) do not end in pregnancy failure, the survival rate being higher at the later end of gestational range[3]. Hypothetically it is presumed that bleeding in first trimester results from placental dysfunction which might be responsible for adverse outcomes at the later part of gestation including pre-eclampsia, preterm birth, abruption and fetal growth restriction[4]. Compromised placental function may be due to abnormal cytotrophoblast invasion or spiral artery remodelling during placental development. It was also hypothesized that chorio-decidual bleeding might subsequently lead to chronic inflammation or act as nidus for bacterial infection. All these factors may be contributory in inciting premature uterine activity. In this prospective study we aimed to compare pregnancies with TM at first trimester with control arm to evaluate its impact on pregnancy and perinatal outcomes.

METHODOLOGY

This was a prospective cohort study conducted in the Department of Obstetrics and Gynaecology at Calcutta National Medical College, a tertiary care hospital in Eastern India, the study period covering one and half year from March 2021 to September 2022. Approximately 60-70% rural patients attend this hospital either through roadways and suburban railway network or being referred from peripheral rural hospitals, from remote areas, and also from adjoining states. The study was approved by Institutional Ethics Committee vide approval number EC/ CNMC/100(3) Dated 27.1.2021. Total 54 participants attending antenatal clinic in first trimester were included after obtaining informed consent from every pregnant mother. Baseline demographic data was recorded. Threatened miscarriage was defined as bleeding or spotting with viable embryo or fetus confirmed by trans-vaginal sonography with 5-7MHz probe at first trimester up to 12 weeks 7days POG. 54 participants had TM who were followed up till subsequent miscarriage or delivery and their pregnancy and perinatal outcomes were compared with 50 controls. Participants with any medical co-morbidities including pre gestational diabetes, hypertension, autoimmune and thyroid disorder, uterine anomalies that might affect pregnancy outcomes, miscarriages in present pregnancy, USG diagnosed twin and those who refused to give consent were excluded from the present study.

Statistical Analysis

Data was analysed with Microsoft Excel and SPSS software version 26.0. Mean and standard deviation of the quantitative variables were measured. For categorical variables, significant group differences in the distribution of proportion were estimated by using the chi-square test or Fisher's exact test. The difference between continuous variables was measured by

using independent T test. *P*-value ≤0.05 was taken as significant.

RESULTS

Our study included 104 women who were residents of rural areas and attended this Medical College for Antenatal check-up. Women with threatened miscarriage constituted the Case group of 54 and the control group comprised of 50 healthy mothers. Among the 54 cases, four had subsequent miscarriages in second trimester (7.4%) and 50 pregnancies (92.6%) continued to period of viability.

Table 1. Demographic Characteristics

Parameter	Cases (n=50)	Controls (n= 50)	*P*-value
Multi gravida	24 (48%)	27 (54%)	0.689
Previous Caesarean	6 (12%)	11 (22%)	0.287
Previous abortion	19 (38%)	11 (22%)	0.127
Irregular menstrual history	13 (26%)	11 (22%)	0.815

All the *p*-values were greater than the common significance level of 0.05, indicating that there were no statistically significant differences between the cases and control groups for any of the demographic parameters listed.

Table 2. Maternal Outcomes

Parameter	Cases (n=50)	Controls (n= 50)	Chi square	*P*-value	Relative risk	CI (confidence interval)
APH	15(30%)	1 (2%)	12.57	0.00039*	2.25	1.70-2.99
(Placenta previa)	11(22%)	0(0%)				
Preterm labour	14 (28%)	7 (14%)	2.17	0.141	1.46	0.99-2.15
PPH	7 (14%)	4 (8%)	0.41	0.523	1.32	0.80-2.16
Preeclampsia (PE)	15 (30%)	8 (16%)	2.03	0.154	1.43	0.98-2.11
Oligohydramnios	8 (16%)	5 (10%)	0.35	0.552	1.27	0.79-2.06
Caesarean delivery in this pregnancy	26(52%)	14 (28%)	5.04	0.025*	1.63	1.11-2.39

*Significant

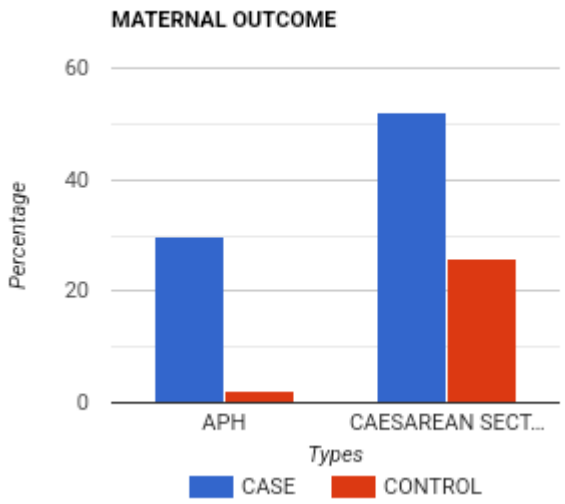
The 50 mothers of the case group where pregnancy continued to viability were compared with the 50 mothers of control group with regard to maternal outcomes (Table 2). Antepartum haemorrhage was observed among 30% of cases and 2% of controls, and this difference was statistically significant (p=0.00039), with a relative risk of 2.25. Caesarean

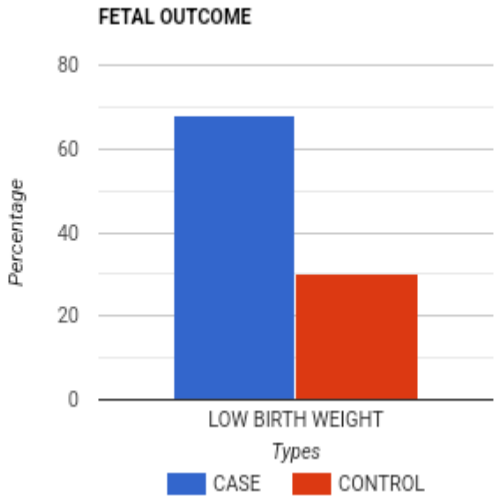
delivery was 52% in cases and 28% in controls which was statistically significant (p=0.025) with a relative risk of 1.63. Statistically significant difference (p value <0.05) were found for APH and Caesarean delivery in this pregnancy, indicating that these outcomes are more likely to occur in the case group compared to the control group. For other parameters the differences were not statistically significant, although pre-eclampsia showed trends towards significance.

Table 3. Neonatal Outcomes.

Parameter	Cases (n=50)	Controls (n= 50)	Chi square	*P*-value	Relative risk (RR)	Confidence interval (CI)
Low birth weight (<2.5 kg)	34 (68%)	15 (30%)	12.97	0.00032*	2.21	1.42-3.46
Preterm birth (<37 weeks)	18 (36%)	9 (18%)	3.25	0.072	1.52	1.05-2.21
FGR(10^{th} centile for gestational age)	11 (22%)	7 (14%)	0.61	0.435	1.28	0.83-1.98
NICU admission	16 (32%)	11 (22%)	0.81	0.368	1.27	0.85-1.89
Perinatal death	4 (8%)	1 (2%)	0.84	0.359	1.65	1.02-2.68

Table 3 dealt with neonatal outcomes and Low birth weight was found amongst 68% cases and 30% of controls and this difference was statistically significant (p= 0.00032) with a relative risk of 2.21. Statistically significant difference (p value <0.05) was found with Low birth weight indicating that these outcomes are more likely to occur in the case group compared to the control group. For other parameters the differences were not statistically significant, although preterm births showed trends towards significance.





DISCUSSION

It was hypothesised that bleeding in first trimester might indicate poor placental function causing adverse outcomes including preterm birth, FGR, & abruption [4,5,6]. The damaged deciduo-placental interphase due to bleeding in TM might be responsible for permanent compromise in placental function in the later part of pregnancy[7]. In this cohort study we found major maternal adverse outcome was APH among pregnancies complicated with TM with 2.25 fold increased RR and p value which was significant (p=0.00039) when compared with control group. Dongol A et al found more spontaneous abortions in mothers with subchorionic hematoma more than 20 cm2[8]. In a systematic review by Saraswat et al, authors reported that women with first trimester vaginal bleeding were more prone to have APH if pregnancy was continued beyond viability (>=24 weeks POG)[9]. In our study we found that 73.3% of the mothers with APH had bleeding due to placenta previa and similar result was found in the study by Konje et al where APH was mostly due to placenta previa rather than abruption[7]. Ahmed et al observed APH, FGR, PIH, CS rate were increased but not statistically significant[10]. In our study CS rate was 52% and that in the study by Amirkhani et al was 41%[11]. Saraswat et al also found no association between mode of delivery and occurrence of TM[9], however the higher risk of caesarean delivery in current pregnancy was found to be statistically significant in our study.

LBW resulted from both preterm labour and conditions where early delivery was indicated for obstetric complications. We found a relative risk of 2.21(95% CI 1.42-3.46) for LBW among cases, and our finding was similar to Sun et al who found a RR of 2.52 for LBW with CI between 1.34-4.75 [12]. Prematurity was the major complication in the study by Konje et al [7]. The over-all adjusted risk was found to be 2.05 (95% CI 1.76-2.4) in the systematic review by Saraswat et al [9]. John et al described the possible etiopathology of preterm onset of labour[13]. It might be that the iron deposits at the site of placental bleeding due to TM might induce

oxidative stress leading to preterm labour[14]. In our study, prematurity resulted from both preterm onset of labour and premature delivery where early termination was required with RR value 1.46 (p=0.141) and 1.52 (P=0.072) respectively (Table 2 and Table 3).

The major limitation of the study was the small sample size and observation over a short span of time. Additionally, occurrence of preterm pre labour rupture of membranes (PPROM), severity of the bleeding during TM and treatment administered should have been assessed individually.

CONCLUSION

Vaginal bleeding in the first trimester of pregnancy may result in adverse maternal and perinatal outcomes. Hence pregnancies with threatened miscarriage should be considered high-risk pregnancies. Therefore, adequate counselling must be instituted to improve awareness, so that mothers attend antenatal clinics regularly, and care providers make timely referrals to higher centres in order to minimise the possibilities of complications –thereby improving the overall outcome of pregnancy.

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