

Fetomaternal Outcome Among Pregnant Women with First Trimester Vaginal Bleeding: A Study at Tertiary Care Centre

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Abstract

Background: Vaginal bleeding in the first trimester is one of the most common obstetric emergencies affecting 16–25% of pregnancies with an increased risk of adverse maternal and fetal outcomes. While the majority of cases of early bleeding proceed without complications, the potential for miscarriage, premature delivery, fetal growth restriction and neonatal morbidity are all concerns. This study was done to assess fetomaternal outcome in first trimester pregnant women with vaginal bleeding at a tertiary care center. **Material and Methods:** The study is a prospective observational study which was conducted in the department of obstetrics and gynaecology in Government R.D.B.P. Jaipuria hospital, Jaipur during a period of about 10.5 months. 300 women with singleton pregnancy were enrolled after informed consent in the first trimester of pregnancy with vaginal bleeding. A pre-designed proforma was used to obtain detailed demographic, clinical, laboratory and ultrasonographic data. Participants were followed until pregnancy outcome to assess maternal and fetal outcomes. The data were analysed by SPSS version 26.0 and p value less than 0.05 was taken as statistically significant. **Results:** Most of women were in the age group of 21–25 years (42.0 %), Primigravida (61.0 %) and presented at 6–10 weeks of gestation (54.0 %). The most frequent diagnosis was threatened abortion (56.0%). Overall, the proportion of women who had term delivery was 61.0%, abortion was 28.0% and preterm delivery was 8.0%. The most common maternal complication was preterm labour (8.0%). Of the 207 live births, 88.4% were at term, 75.4% had a birth weight >2.5 kg, 90.3% and 95.2% had an APGAR score of 7–10 at 1 and 5 minutes respectively. Intrauterine growth restriction was present in 23.2% of neonates, while 12.6% needed admission to NICU, mostly for birth asphyxia and respiratory distress syndrome. **Conclusion:** Vaginal bleeding in the first trimester of pregnancy is a significant risk factor for poor pregnancy outcomes and should be assessed early, risk-stratified and monitored closely during the antenatal period. While most pregnancies resulted in term delivery, women with early pregnancy bleeding were still at risk for miscarriage, preterm delivery, intrauterine growth restriction and neonatal morbidity. Fetomaternal outcomes may be better with early ultrasonographic assessment and individualized obstetric management.

Keywords: First trimester bleeding; Threatened abortion; Fetomaternal outcome; Pregnancy outcome; Neonatal outcome.

Received: 01 July 2026

Revised: 18 July 2026

Accepted: 05 August 2026

Published: 20 August 2026

INTRODUCTION

The first trimester of pregnancy, defined as the first 12 completed weeks of gestation, is a critical period of implantation, placental development, embryogenesis and early fetal organogenesis.^[1] Passing this stage is critical for a positive pregnancy outcome.^[2] One of the most frequently seen obstetric emergencies in clinical practice is vaginal bleeding in the first trimester, which can be a significant psychological stress for the expectant mother and her family.^[3] It is estimated to affect 16–25% of all pregnancies, and is a common reason for emergency obstetric consultation and admission.^[4]

First trimester vaginal bleeding may be caused by physiological or benign conditions such as implantation bleeding or pathological conditions such as threatened abortion, inevitable abortion, incomplete abortion, missed abortion, ectopic pregnancy or gestational trophoblastic disease.^[5,6] Of these, threatened abortion (defined as vaginal bleeding before 20 weeks of gestation with a closed cervical os and a viable intrauterine pregnancy) is the most common

clinical presentation.^[7] While many pregnancies go on to a successful outcome after early bleeding, there are increasing data to support the link between first trimester vaginal bleeding and increased risk for adverse maternal and fetal outcomes.^[8] These include spontaneous miscarriage, preterm labor, premature rupture of membranes, hypertensive disorders of pregnancy, placental abruption, fetal growth restriction, low birth weight, operative delivery and increased neonatal intensive care unit (NICU) admissions.^[9] The mechanisms by which early pregnancy bleeding is

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DOI:

10.21276/amit.2026.v13.i2.970

How to cite this article: Saini A, Jain S, Tiwari K, Saini P, Agarwal P, Mathur P. Fetomaternal Outcome Among Pregnant Women with First Trimester Vaginal Bleeding: A Study at Tertiary Care Centre. Acta Med Int. 2026;13(2):1850-1855.

associated with adverse obstetric outcomes are thought to include poor placentation, defective trophoblastic invasion, decidual hemorrhage, and subchorionic hematoma formation, all of which may lead to placental dysfunction later in pregnancy.^[6] Ultrasonography, especially transvaginal ultrasonography, is now the mainstay of the investigation of women with first-trimester bleeding and is useful for early confirmation of fetal viability, localization of pregnancy, and detection of complications like subchorionic hematoma or ectopic gestation.^[10] However, fetal cardiac activity doesn't rule out the possibility of later poor pregnancy outcomes. Even pregnancies that survived an episode of early bleeding were shown to have higher rates of preterm birth, intrauterine growth restriction, low birth weight and NICU admissions in previous studies.^[11]

Multiple investigators have pointed out that the prognosis for pregnancies complicated by bleeding in the first trimester is related to the presenting gestational age, severity and duration of bleeding, presence of abdominal pain, and ultrasound findings. Bleeding at an earlier gestational age has been linked to significantly higher rates of pregnancy loss, while those that survive first trimester bleeding do continue to have a higher risk for placental and neonatal complications.^[8,12] Affected women have also experienced an increased incidence of maternal complications such as anemia, preeclampsia, placenta previa, placental abruption, and cesarean delivery.^[1,12] As the evidence base expands, differences in patient populations, access to care and regional obstetric practices remain a factor in pregnancy outcomes, which highlights the importance of the institution-specific data to inform clinical management and counseling.

Hence, the aim of the present study was to assess fetomaternal outcome in pregnant women presenting with vaginal bleeding in first trimester and to determine the factors associated with poor pregnancy outcome.

MATERIALS AND METHODS

The study is a prospective observational study in the Department of Obstetrics and Gynaecology, Government R.D.B.P. Jaipuria Hospital, affiliated to RUHS College of Medical Sciences (RUHS-CMS), Jaipur. The study was undertaken after obtaining approval from the Institutional Research Review Board (IRRB) and the Institutional Ethics Committee. The total study period was about 10.5 months, which included 3 months for participant recruitment and data collection and 6–7.5 months for follow-up and completion of the study. The study population comprised of all women who presented to the outpatient department or as inpatients with vaginal bleeding in the first trimester of singleton pregnancies.

Sample size was determined by applying the formula for single population proportion with the reported prevalence of first trimester vaginal bleeding as 8.5% by Kamble et al. [8] and $Z = 1.96$ (95% confidence level), $p = 0.085$ and $d = 0.032$. The minimum sample size was determined to be 290, and to account for potential attrition and to achieve sufficient statistical power, the sample size was planned to

be 300 participants.

The study included pregnant women with positive urine pregnancy test (UPT) who presented with bleeding per vaginum in the first trimester and had a singleton pregnancy who were willing to participate with written informed consent. Women who had had a history of trauma or surgery during the current pregnancy, multiple gestations, cervical incompetence, congenital uterine anomaly, uterine fibroids, cervical pathologies (cervical polyps or cervical erosion) and who were on medications that are known to cause bleeding during pregnancy were excluded. Following the enrolment, detailed sociodemographic data like age, education, place of residence, socioeconomic status by Modified Kuppuswamy Scale was entered. A detailed history including obstetric, menstrual, medical and surgical history was taken and then detailed general physical, systemic and obstetric examinations were carried out.

Clinical evaluation of all the participants included appropriate laboratory and imaging investigations. Baseline investigations were complete blood count, blood grouping and Rh typing, bleeding time, clotting time and prothrombin time/international normalized ratio (PT/INR) and obstetric ultrasonography (transabdominal or transvaginal as clinically indicated). Other tests like blood urea, serum creatinine, random blood sugar, liver function tests, thyroid function tests, TORCH profile, HIV, hepatitis B surface antigen (HBsAg), Venereal Disease Research Laboratory (VDRL) test, electrocardiography and routine urine examination with microscopy were ordered when clinically indicated.

Data were collected on a semi-structured, predesigned proforma recording the demographic features, clinical presentation, laboratory and ultrasonographic findings, progression of pregnancy and maternal and fetal outcomes. Maternal outcome measures were miscarriage, mode of delivery, hypertensive disorders, placental complications and other obstetric events, while fetal outcome measures were gestational age at delivery, birth weight, APGAR scores, intrauterine growth restriction (IUGR), neonatal intensive care unit (NICU) admission and perinatal mortality.

All of the participants were enrolled only after a written informed consent was obtained and confidentiality and anonymity of patient information were maintained throughout the study according to the ethical principles. Data collected were entered in Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS) version 26.0 (IBM Corp., Armonk, NY, USA). Categorical variables were presented as frequencies and percentages, and continuous variables as mean $\pm$ standard deviation (SD). Where appropriate, appropriate statistical tests were used and a p-value of <0.05 was regarded as statistically significant.

RESULTS

Three hundred pregnant women with first-trimester vaginal bleeding were studied. The majority of participants were aged 21–25 years (126, 42.0%), followed by those aged 31–35 years (59, 19.7%) and 26–30 years (56, 18.7%). Most women were primigravida (183, 61.0%). In terms of socioeconomic status, the majority was lower middle class (99, 33.0%) and the upper

lower class (95, 31.7%). Over half of the participants presented between 6-10 weeks of gestation (162, 54.0%)

with 24.0% presenting before 6 weeks and 22.0% after 10 weeks of gestation. [Table 1]

Table 1: Baseline demographic and obstetric characteristics of the study participants (N = 300)

Variable	Category	n	%
Age (years)	18-20	33	11.0
	21-25	126	42.0
	26-30	56	18.7
	31-35	59	19.7
	36-40	26	8.7
Gravidity	Primigravida	183	61.0
	Multigravida	117	39.0
Socioeconomic status	Upper	14	4.7
	Upper middle	46	15.3
	Lower middle	99	33.0
	Upper lower	95	31.7
	Lower	46	15.3
Gestational age at presentation	<6 weeks	72	24.0
	6-10 weeks	162	54.0
	>10 weeks	66	22.0

Most common was threatened abortion (168, 56.0%), followed by subchorionic hematoma (39, 13.0%), missed abortion (37, 12.3%) and inevitable abortion (32, 10.7%). Fifteen (5.0%) women had complete abortion, 6 (2.0%) had ectopic pregnancy and 3 (1.0%) had molar pregnancy.

Concerning pregnancy outcomes, 183 (61.0%) women delivered their babies at term, 84 (28.0%) women had abortions and 24 (8.0%) women had preterm births. Surgical intervention was needed in 6 (2.0%) and evacuation in 3 (1.0%). [Table 2]

Table 2: Clinical diagnosis and maternal outcomes among women with first-trimester vaginal bleeding (N = 300)

Variable	Category	n	%
Diagnosis	Threatened abortion	168	56.0
	Subchorionic hematoma	39	13.0
	Missed abortion	37	12.3
	Inevitable abortion	32	10.7
	Complete abortion	15	5.0
	Ectopic pregnancy	6	2.0
	Molar pregnancy	3	1.0
Pregnancy outcome	Term delivery	183	61.0
	Preterm delivery	24	8.0
	Abortion	84	28.0
	Surgical intervention	6	2.0
	Evacuation	3	1.0

The most common maternal complications included preterm labour (24, 8.0%). Gestational diabetes mellitus was noted in 8 (2.7%) women and pregnancy-induced hypertension and placental abruption were noted in 7 (2.3%) women

each. Anemia was reported in 6 (2.0%) participants, followed by intrauterine fetal death in 5 (1.7%) and premature rupture of membranes in 4 (1.3%). The lowest was hypothyroidism with one participant (0.3%). [Table 3]

Table 3: Maternal complications among study participants (N = 300)

Maternal complication	n	%
Preterm labour	24	8.0
Gestational diabetes mellitus	8	2.7
Pregnancy-induced hypertension	7	2.3
Placental abruption	7	2.3
Anemia	6	2.0
Intrauterine fetal death	5	1.7
Premature rupture of membranes	4	1.3
Hypothyroidism	1	0.3

Of the 207 women who continued their pregnancy beyond the first trimester and delivered, the most common mode of delivery was full-term vaginal delivery (122, 58.9%) followed by full-term lower segment cesarean section (61, 29.5%). Most of the deliveries were at or after 37 weeks of

gestation (183, 88.4%). Most neonates (156, 75.4%) weighed more than 2.5 kg, 39 (18.8%) weighed between 2.0 and 2.5 kg, and 12 (5.8%) weighed less than 2.0 kg. Intrauterine growth restriction was recorded in 48 (23.2%) neonates. [Table 4]

Table 4: Delivery characteristics and neonatal outcomes among live births (n = 207)

Variable	Category	n	%
Mode of delivery	Full-term vaginal delivery	122	58.9
	Full-term LSCS	61	29.5
	Preterm vaginal delivery	15	7.2
	Preterm LSCS	9	4.3
Gestational age at delivery	<28 weeks	2	1.0
	28–33+6 weeks	6	2.9
	34–36+6 weeks	16	7.7
	≥37 weeks	183	88.4
Birth weight	<2 kg	12	5.8
	2–2.5 kg	39	18.8
	>2.5 kg	156	75.4
Intrauterine growth restriction	Yes	48	23.2
	No	159	76.8

One hundred eighty-seven neonates (90.3%) had APGAR scores of 7–10 at one minute after birth and 197 neonates (95.2%) at five minutes after birth. 31 (15%) neonates required NICU admission; 176 (85%) neonates did not require intensive neonatal care. The most common

indications for NICU admission were birth asphyxia (15, 7.2%), respiratory distress syndrome (11, 5.3%), necrotizing enterocolitis (4, 1.9%), and neonatal sepsis (1, 0.5%). [Table 5]

Table 5: Neonatal condition at birth and NICU outcomes among live births (n = 207)

Variable	Category	n	%
APGAR score at 1 minute	4–6	15	7.3
	7–10	187	90.3
APGAR score at 5 minutes	4–6	5	2.4
	7–10	197	95.2
NICU admission	Yes	31	15.0
	No	176	85.0
Indication for NICU admission	Birth asphyxia	15	7.2
	Respiratory distress syndrome	11	5.3
	Necrotizing enterocolitis	4	1.9
	Sepsis	1	0.5

DISCUSSION

In the present prospective observational study, fetomaternal outcome in 300 women with vaginal bleeding in first trimester was evaluated at a tertiary care centre. Most participants were aged 21–25 years (42.0%), were primigravida (61.0%), and were in their 6–10th week of gestation and were in the lower middle or upper lower socioeconomic status. This is similar to the demographic characteristics reported by Choudhury et al., where the majority of women were in the age group 25–34 years and Das et al., where the highest incidence was found in the age group 20–29 years.^[13,14] Similarly, Ghosh et al. and Chandrakala et al. showed that cases of bleeding in first trimester were more common among primigravidas, implying that first trimester bleeding is more common in first pregnancy.^[15,16] The majority of women in the current study were diagnosed with threatened abortion (56.0%), subchorionic hematoma (13.0%) and missed abortion (12.3%). These results are similar to that of Bansal et al (2015) who found threatened abortion in 55.2%, but higher than that of studies limited to non-viable pregnancy where a higher proportion of missed and incomplete abortions were found.^[17] The apparent concentration of cases from 6 to 10 weeks of gestation also confirms previous findings that this time is when placentation is active and the most sensitive to pregnancy disruption. Although there were a lot of cases of bleeding in the first

trimester, the outcome of pregnancies was generally good, with 61.0% of women having term births, 28.0% abortions and 8.0% preterm births. These results are comparable to those reported by Choudhury et al. who reported term delivery in 69.2% of women and Das et al. who reported successful continuation of pregnancy in more than half of the viable pregnancies.^[13,14] Islam et al. also have reported abortion rates similar to that of the present study, but their cohort had a higher rate of preterm birth.^[18] Maternal complications in the current study were relatively uncommon, with the most common complication being preterm labour (8.0%), followed by gestational diabetes mellitus (2.7%), pregnancy induced hypertension (2.3%), placental abruption (2.3%) and anemia (2.0%). These complication rates were lower when compared to the rates reported by Chandrakala et al., Ghosh et al., and Choudhury et al., who reported significantly higher rates of preterm labour, hypertensive disorders, PROM and placental abruption in women with early pregnancy bleeding.^[13,15,16] All these results suggest that bleeding in early pregnancy is a valid predictor of later obstetric complications, but that careful monitoring and prompt treatment can significantly reduce maternal morbidity. For women who proceeded with their pregnancies beyond viability, the majority of deliveries were vaginal (58.9%) while cesarean section was used for about one-third of deliveries. Das et al. reported similar preponderance of vaginal delivery, and Choudhury et al. and Mohamed et al. reported significantly higher cesarean section rate, which could be attributed to the

differences in the severity of the cases and obstetric indications.^[13,14] Neonatal outcomes were also mostly reassuring in the present study. Approximately three-fourths of the neonates had a birth weight >2.5 kg, and more than 88.4% were born at term. The majority of neonates had favorable APGAR scores, with 90.3% scoring 7–10 at 1 minute and 95.2% scoring 7–10 at 5 minutes after birth. These are good results as compared to those reported by Choudhury et al., Mohamed et al., but Ghosh et al. reported a significantly higher low birth weight and neonatal compromise.^[13,15] However, 23.2% of neonates were intrauterine growth restricted, which corroborates earlier findings of association between early pregnancy bleeding and placental insufficiency and fetal growth restriction. Only 15% of neonates needed admission to NICU, with the most frequent reasons being birth asphyxia and respiratory distress syndrome. This was significantly lower than the rate reported by Chandrakala et al. and Ghosh et al. who reported NICU admission in about one-fifth and one-third of neonates after first trimester bleeding, respectively.^[15,16] The findings indicate that pregnancies complicated by first trimester vaginal bleeding have a higher risk of adverse fetal outcome, but that good neonatal outcomes can be obtained with early diagnosis, careful antenatal management, serial fetal surveillance, and timely obstetric management.

Strengths and Limitations

The strength of the present study is that it was a prospective observational study with a sufficient number of cases, standardized clinical assessment and complete follow-up of the women until pregnancy outcome, which enabled comprehensive evaluation of maternal and fetal outcomes in women who presented with vaginal bleeding in the first trimester of pregnancy. The detailed clinical, laboratory and ultrasonographic findings added to the reliability of the outcome assessment and represent the real world practice of a tertiary care centre. But there are also some drawbacks to the study. The study is a single centre hospital study, so the results may not apply to the general population. There was no comparison group of pregnant women without first trimester bleeding to directly estimate the relative risk associated with early pregnancy bleeding. Furthermore, the severity, duration and frequency of vaginal bleeding were not analyzed separately, and long-term neonatal outcomes beyond the immediate perinatal period were not assessed, which might have allowed further insight into the prognostic factors affecting fetomaternal outcomes.

CONCLUSION

Bleeding in the first trimester is an important predictor of adverse pregnancy outcomes and should be viewed as a high-risk obstetric condition which needs to be evaluated and closely monitored during the antenatal period. Threatened abortion was the most common diagnosis and while most women went on to deliver a term infant with good outcomes, there was also a significant number of abortions, preterm deliveries and IUGR and other maternal and neonatal complications. Such results emphasize the

need for early ultrasonographic evaluation, proper risk stratification, frequent follow-up and timely obstetric intervention for the benefit of fetomaternal outcomes. Improved antenatal counselling and management of women with first trimester bleeding can help minimize preventable complications and maximize pregnancy outcomes.

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