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Original Research Article

First-trimester vaginal bleeding: clinical presentation, associated factors, and pregnancy outcomes in a tertiary care setting

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ABSTRACT

Background: Vaginal bleeding in the first trimester is a common occurrence, causing significant anxiety for patients and diagnostic challenges for clinicians. It is associated with a spectrum of outcomes, from viable pregnancies to pregnancy loss. Understanding the factors influencing these outcomes is crucial for patient counselling and management. Objectives were to evaluate first-trimester bleeding associated with miscarriage, ectopic pregnancy, and hydatidiform mole, and to assess the management and outcomes of pregnancies complicated by first-trimester vaginal bleeding.

Methods: A prospective observational study was conducted on 200 women presenting with first-trimester vaginal bleeding at a tertiary health center in North Gujarat from September 2022 to February 2025. Data were collected through detailed history, clinical examination, and ultrasound findings. Patients were followed up to determine pregnancy outcomes. Bleeding severity was categorized as spotting, moderate, or heavy.

Results: The majority of patients (72.5%) were in the 21-30 years age group. Primigravidas constituted 55% of cases. 70% of miscarriage cases were un-booked. A history of previous miscarriage was present in 40% of patients. Most presentations (35.5%) occurred at 8-10 weeks of gestation. Absence of abdominal pain was associated with a better outcome (44% viable versus 16% non-viable) compared to its presence (19% viable versus 21% non-viable). Spotting was associated with a high viability rate (85.8%), whereas all cases (100%) with heavy bleeding resulted in non-viable outcomes. Miscarriages were the most common diagnosis (90%). Overall, 63% were diagnosed as threatened miscarriages and managed conservatively. Subchorionic hematoma (SCH) was noted in 15 threatened miscarriage cases, with 40% having a favorable full-term outcome. Ultimately, 104 (52%) pregnancies had a viable outcome, while 96 (48%) were non-viable.

Conclusions: First-trimester vaginal bleeding is strongly associated with adverse pregnancy outcomes, with the amount of bleeding and presence of abdominal pain being significant prognostic indicators. Spotting often has a favorable outcome, while heavy bleeding invariably leads to pregnancy loss. SCH negatively impacts prognosis. Timely evaluation, appropriate counselling, and management are essential to mitigate anxiety and improve maternal and perinatal outcomes.

Keywords: Ectopic pregnancy, First-trimester bleeding, Miscarriage, Pregnancy outcome, Subchorionic hematoma, Vaginal bleeding

INTRODUCTION

The desire for motherhood is profound, and ensuring 'safe motherhood' encompasses the well-being of both the mother and the fetus. Vaginal bleeding in early pregnancy is a significant concern, representing a potential threat to the developing embryo and causing considerable anxiety for both the patient and the clinician. The first trimester, a critical period of ovulation, fertilization, implantation, and organogenesis, can be complicated by vaginal bleeding in

an estimated 20-25% of all pregnant women.[1,2] This bleeding can signify a range of conditions, from a continuing viable pregnancy to a non-viable one, including threatened miscarriage, complete or incomplete miscarriage, missed miscarriage, ectopic pregnancy, gestational trophoblastic disease (GTD), or simply implantation bleeding.

It is reported that less than 50% of first-trimester pregnancies complicated by bleeding progress normally beyond 20 weeks of gestation; approximately 30% will result in abortion, 10-15% will be ectopic pregnancies, and a small percentage will be hydatidiform moles.[1] Threatened miscarriage, complicating about 15% of pregnancies, even if the pregnancy continues, is associated with increased risks of adverse obstetric outcomes such as preterm labor, low birth weight, fetal growth restriction (FGR), preeclampsia, and premature rupture of membranes.[3] The uncertainty surrounding the outcome, lack of definitive preventive measures, and the emotional impact of potential early pregnancy loss contribute to a stressful experience for women and their families.[4]

The prognosis following first-trimester bleeding is often unpredictable, irrespective of management approaches. Given the increased feto-maternal risks, appropriate clinical evaluation and decision-making regarding management, including the mode, place, and timing of delivery, are crucial for improving neonatal outcomes. While numerous studies have investigated aspects of first-trimester bleeding, ongoing region-specific data are valuable for contextual understanding and management strategies.

This study aimed to prospectively evaluate the clinical presentations, associated factors, management, and outcomes of first-trimester vaginal bleeding in women attending a tertiary care hospital, with specific objectives to assess its association with miscarriage, ectopic pregnancy, and hydatidiform mole, and to document the management of associated signs and symptoms.

METHODS

Study design and setting

This prospective observational study was conducted over 24 months, from September, 2022, to February, 2025, at a GMERS Medical College and Research Centre, tertiary health center in north Gujarat.

Participants

The study included 200 women who presented with a history of amenorrhea, a positive urine pregnancy test, and bleeding per vagina in the first trimester (up to 12 weeks of gestation).

Inclusion criteria

Patients with bleeding per vagina in the first trimester, including diagnoses of miscarriages, ectopic pregnancy, and molar pregnancy.

Exclusion criteria

Patients presenting with vaginal bleeding following medical termination of pregnancy (MTP), those with known bleeding tendencies, a history of mechanical trauma during the current pregnancy, or those with any identified cervical, vaginal, or other local pathology causing the bleeding.

Data collection

A complete history was taken, followed by a detailed general physical and systemic examination for all patients. A structured proforma was used to collect information, including demographic details, obstetric history (LMP, EDD, past pregnancies, history of previous miscarriage), details of vaginal bleeding (duration, severity, associated abdominal pain, precipitating activities), past medical/surgical history, habits, and drug history. The severity of vaginal bleeding was categorized based on self-assessment by the patient and clinical visualization by the provider:

Spotting

Scant bleeding or traces of blood, visualized as staining of a glove or dirty discharge.

Moderate bleeding

Reported by the patient as “like menses”, visualized as a small amount of blood in the vagina and at the cervix, equating to 2-3 pad soakages in 24 hours.

Heavy bleeding

Reported by the patient as “more than menses”, visualized as a moderate to severe amount of blood in the vagina and at the cervix, equating to more than 3 pad soakages in 24 hours.

Local examination included per speculum examination to assess the bleeding, identify local causes (polyp, erosion), note the state of the cervical os, and look for products of conception. Per vaginal examination assessed uterine size, consistency, position, cervical status, and adnexal masses or tenderness.

Investigations

Baseline investigations included hemoglobin estimation, blood grouping and Rh typing, random blood sugar, serology for HIV, HBsAg, and VDRL, and urine routine and microscopy. Coagulation profiles (BT, CT, PT/INR,

APTT) were done for all patients to rule out bleeding tendencies. Serum TSH and beta-hCG levels were assessed as indicated. Ultrasound examination (transabdominal and transvaginal as required) was performed for all subjects to confirm gestational age, assess fetal viability (cardiac activity, crown-rump length (CRL)), evaluate gestational sac characteristics, yolk sac, identify subchorionic hematoma (SCH), and examine bilateral adnexa and the pouch of Douglas (POD).

Follow-up and outcome measures

Patients were followed up regularly in the antenatal clinic with repeat ultrasound scans and other investigations as required throughout their pregnancy until termination. Postpartum follow-up was conducted via telephonic conversation or medical record review for 3 months. The primary outcomes studied were the status of the pregnancy at the end of the first trimester (threatened miscarriage, types of completed miscarriage, ectopic pregnancy, molar pregnancy) and the final pregnancy outcome (full-term birth, preterm birth, IUGR, miscarriage, perinatal mortality). Management strategies for different conditions were also documented.

Ethical consideration

The study was conducted at a tertiary health center, implying adherence to institutional ethical guidelines for prospective patient studies. Informed consent was assumed as part of standard care and data collection for research in such a setting.

Statistical analysis

Data were collected in a structured proforma and analyzed. Descriptive statistics were used to present frequencies and percentages. Correlations between clinical parameters (e.g., amount of bleeding, presence of pain) and pregnancy outcomes were examined (further details on specific statistical tests were not provided in the source document but would typically include chi-square tests or logistic regression for categorical outcomes).

RESULTS

A total of 200 women presenting with first-trimester vaginal bleeding were included in this prospective study.

Patient demographics and baseline characteristics

The age of patients ranged from 18 to 35 years. The majority of women (145, 72.5%) were in the 21-30 years age group, with 18% (20 years) and 9.5% (≥31 years) in other groups (Table 1). Primigravidas constituted 55% (n=110) of the study population, while multigravidas accounted for 45% (n=90) (Table 1). Among cases that resulted in miscarriage, 70% (n=140, if referring to all 200 as potential miscarriages initially, this number seems high and might refer to a subset or all cases presenting as emergencies) were unbooked, while 30% (n=60) were booked cases (Table 1). A history of previous miscarriage was present in 80 (40%) patients. Among these, 56 (28% of total) had a history of spontaneous miscarriage, and 24 (12% of total) had a history of induced miscarriage (Table 1).

Table 1: Patient demographics and baseline characteristics.

Category	Sub-category	No. of patients	Percentage
Age (in years)	20	36	18
	21-30	145	72.5
	≥31	19	9.5
	Total	200	100
Gravidity	Primi	110	55
	Multi	90	45
	Total	200	100
Cases	Booked cases	60	30
	Unbooked cases	140	70
	Total	200	100
Previous miscarriage	Spontaneous miscarriage	56	28
	Induced miscarriage	24	12
	Total	80	40

Clinical presentation

Based on menstrual history, the duration of amenorrhea at presentation varied: 1-1.5 months (31, 15.5%), 1.5-2 months (58, 29%), 2-2.5 months (67, 33.5%), and 2.5-3 months (44, 22%) (Table 2). According to ultrasound (USG) findings for intrauterine pregnancies (IUGS), the gestational age at bleeding was: 4-6 weeks (24, 12%), 6-8 weeks (47, 23.5%), 8-10 weeks (71, 35.5%), and >10 weeks (38, 19%). Additionally, 4 cases (2%) were vesicular moles and 16 (8%) were ectopic pregnancies diagnosed at various early gestations (Table 3). The most common presentation time was 8-10 weeks gestation.

Table 2: Gestational age at the time of presentation (according to history).

Duration of amenorrhea	Number	%
1-1.5 months	31	15.5
1.5-2 months	58	29
2-2.5 months	67	33.5
2.5-3 months	44	22
Total	200	100

Of the 200 patients, 80 presented with abdominal pain in addition to vaginal bleeding. In this group, 38 (19% of total) had a viable outcome, while 42 (21% of total) had a non-viable outcome. Among the 120 patients without abdominal pain, 88 (44% of total) had a viable outcome, and 32 (16% of total) had a non-viable outcome (Table 4).

Table 3: Gestational age according to USG at the time of bleeding.

USG finding	Gestational age in weeks	N	%	% (Bhardvaj et al[10])
IUGS	4-6	24	12	9
	6-8	47	23.5	30
	8-10	71	35.5	35
	>10	38	19	22
Vesicular mole		4	2	1
Ectopic		16	8	3
Total		200	100	100

Table 4: Outcome in patients with abdominal pain and bleeding per vaginum.

Abdominal pain	Outcome	Number (%)
Absent	Viable	88 (44)
	Non-viable	32 (16)
Present	Viable	38 (19)
	Non-viable	42 (21)
Total		200 (100)

Table 5: Amount of bleeding and miscarriage.

Amount	Number of patients	Number of miscarriages (non-viable)				Number of miscarriages (viable)			
		1-2 days	3-4 days	>5 days	Total	1-2 days	3-4 days	>5 days	Total
Spotting	126	7	7	4	18	48	42	18	108
Moderate	50	12	17	3	32	14	4	0	18
Heavy	24	20	4	0	24	0	0	0	0
Total	200	74				126			

Table 6: Clinical diagnosis underlying bleeding per vaginum in 1st trimester.

Clinical diagnosis		Present Study no. (%) 180 (90)	Miscarriages (viable) 126	Miscarriages (non-viable) 54
Miscarriages	Threatened miscarriage	126 (63)	126	-
	Missed miscarriage	14 (7)	-	14
	Blighted ovum	7 (3.5)	-	7
	Inevitable miscarriage	10 (5)	-	10
	Incomplete miscarriage	15 (7.5)	-	15
	Complete miscarriage	8 (4)	-	8
Ectopic pregnancy		16 (8)	-	16
H. mole		4 (2)	-	4
Total		200 (100)	126	74

Table 7: Treatment of 1st trimester bleeding per vaginum.

	Treatment	Number (%)
Threatened miscarriages	Conservative	126 (63)
Ectopic pregnancy	Laparoscopy	3 (1.5)
	Laparotomy	10 (5)
	Medical	3 (1.5)
Miscarriages + v. mole	D and E	58 (29)

Severity and duration of bleeding in relation to outcome

Regarding the amount of bleeding: 126 patients presented with spotting, 50 with moderate bleeding, and 24 with heavy bleeding. Overall, 126 pregnancies were viable, and 74 were non-viable.

Spotting: of 126 cases with spotting, 108 (85.8%) had a viable outcome, while 18 (14.2%) had a non-viable outcome (including 6 ectopic pregnancies, 8 missed miscarriages, 4 blighted ova) (Table 5).

Moderate bleeding: among 50 cases with moderate bleeding, 18 (36%) had a viable outcome, and 32 (64%) had a non-viable outcome (including 10 ectopic pregnancies, 3 blighted ova, 5 inevitable miscarriages, 6 incomplete miscarriages, 4 complete miscarriages, and 4 vesicular moles) (Table 5).

Heavy bleeding: all 24 cases (100%) presenting with heavy bleeding had a non-viable outcome (including 6 missed miscarriages, 5 inevitable miscarriages, 9 incomplete miscarriages, and 4 complete miscarriages) (Table 5). The duration of bleeding also correlated with outcomes, with longer durations generally faring worse, especially for moderate and heavy bleeding categories.

Clinical diagnoses and first trimester status

The underlying clinical diagnoses were: miscarriages (all types collectively) in 180 patients (90%), ectopic pregnancy in 16 patients (8%), and hydatidiform mole in 4 patients (2%) (Table 6). The status at the end of the first trimester was: Threatened miscarriage in 126 cases (63%), missed miscarriage in 14 (7%), blighted ovum (anembryonic gestation) in 7 (3.5%), inevitable miscarriage in 10 (5%), incomplete miscarriage in 15 (7.5%), complete miscarriage in 8 (4%), ectopic pregnancy in 16 (8%), and vesicular mole in 4 (2%) (Table 6).

Management of the 200 cases, 126 (63%) diagnosed as threatened miscarriages were managed conservatively with bed rest, counselling, reassurance, and standard treatment protocols. Miscarriages requiring intervention (58 cases, 29%- including inevitable, incomplete, missed, blighted ovum) and the 4 vesicular moles were managed by dilatation and evacuation (D and E). For the 16 ectopic pregnancies: 3 (1.5%) were managed medically (methotrexate), 10 (5%) required laparotomy, and 3 (1.5%) were managed by laparoscopy (Table 7).

Follow-up and final pregnancy outcomes of the 126 cases initially diagnosed as threatened miscarriage: 90 had a normal live intrauterine fetus initially. Of these, 88 continued beyond 28 weeks (68 full-term births including 3 IUGR, 20 preterm births), and 2 had a second-trimester miscarriage.

15 had a subchorionic hematoma (SCH). Among these, 11 continued beyond 28 weeks (6 full-term healthy, 2 full-term FGR, 3 preterm births), and 4 aborted in the second trimester (Table 8). This means 6 out of 15 (40%) SCH cases resulted in full-term birth.

21 had an irregular gestational sac or large yolk sac. Of these, 11 continued beyond 28 weeks (7 full-term births including 2 FGR, 4 preterm births), and 10 aborted in the second trimester (Table 8).

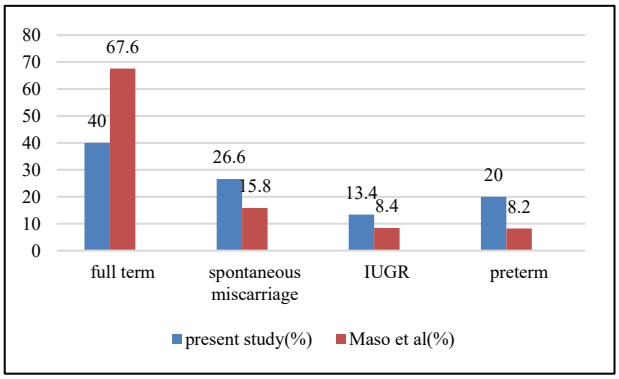

Figure 1: Subchorionic hematoma and outcome.

Table 8: Follow up of the cases with bleeding in 1st trimester.

Cases (n=126)	Status at the end of first trimester	Follow up and outcome of pregnancy
Threatened miscarriage (126)	90 had normal live intrauterine fetus	68-full term births, 3 were born IUGR, 20- preterm births, 2-2nd trimerster. Miscarriage
	15 had subchorionic hematoma	Subchorionic bleed was noted in 15 cases; 4 out of which spontaneously aborted in 2nd trimester. 8 continued to term, 6 were born full term healthy and 2 were born FGR. 3 were preterm birth
	21 had irregular Gsac, large yolk sac	21 irregular Gsac cases, 10 spontaneously aborted in 2nd trimester, 7 full term births, 2 were FGR, 4 preterm births

Table 9: Pregnancy outcome in present pregnancy.

Outcome in current pregnancy	Primigravida	Multigravida
Viable		
FT	40	30
PT	18	9
IUGR+FT	2	5
Perinatal mortality/still birth	4	2
Nonviable		
Missed miscarriage	6	8
Incomplete miscarriage	8	7
Inevitable miscarriage	4	6
Complete miscarriage	3	5
Blighted ovum	4	3
Ectopic pregnancy	10	6
Vesicular mole	2	2
Second trimester miscarriage	9	7

Overall pregnancy outcomes based on gravidity are presented in Table 9. Among 110 primigravidas, 60 (54.5%) had a viable outcome, and 50 (45.5%) had a non-viable outcome. Among 90 multigravidas, 44 (48.9%) had a viable outcome, and 46 (51.1%) had a non-viable outcome. In total, out of 200 patients, 104 (52%) had a viable outcome, and 96 (48%) had a non-viable outcome (including first and second-trimester losses, ectopics, and moles).

DISCUSSION

This prospective study investigated the clinical profile and outcomes of 200 women presenting with first-trimester vaginal bleeding at a tertiary care center. The findings highlight several factors associated with pregnancy prognosis and underscore the significant impact of this common obstetric complication.[5-21]

The majority of our patients (72.5%) were in the 21-30 age group, which is consistent with the peak reproductive age and comparable to studies like Williams et al, where 86.5% of patients were between 20-34 years.[22] Primigravidas comprised 55% of the cases, a finding similar to that of Amirkhani et al (56.7% primigravidas).[23] A concerning finding was that 70% of miscarriage cases were unbooked, suggesting a potential delay in seeking or accessing antenatal care, which could impact outcomes.

A history of previous miscarriage is a known risk factor for subsequent pregnancy loss. In our cohort, 40% of women had a history of previous miscarriage, and the summary suggests that among multigravidas, a history of previous miscarriage was a strong predisposing factor for poor outcomes in the current pregnancy. This aligns with literature indicating that the risk increases with the number of prior miscarriages.[23]

The most common gestational age at presentation with bleeding, both by history and ultrasound, was 8-10 weeks. This period is critical for organogenesis and early placental development. Our finding is comparable to Neelam Bharadvaj et al, who also reported 35% of patients presenting between 8-10 weeks.[10] The presence of abdominal pain accompanying vaginal bleeding was associated with a higher proportion of non-viable outcomes (21% non-viable with pain versus 16% non-viable without pain), suggesting that pain is an important symptom indicating a potentially worse prognosis.

The amount of vaginal bleeding was a strong predictor of pregnancy outcome. Patients presenting with spotting had a high rate of viable outcomes (85.8%). Conversely, all patients (100%) who experienced heavy bleeding had non-viable pregnancies. Moderate bleeding was associated with a non-viable outcome in 64% of cases. These findings are consistent with other studies, such as Hasan et al which reported that heavy bleeding, especially with pain, carries a higher miscarriage risk, while spotting, particularly if brief, often does not.[11]

Miscarriages, in various forms, were the predominant clinical diagnosis (90%), followed by ectopic pregnancy (8%) and hydatidiform mole (2%). This distribution is comparable to that reported by Sofat et al.[13] The majority of cases (63%) were initially diagnosed and managed as threatened miscarriages.

The presence of a subchorionic hematoma (SCH) in 15 cases of threatened miscarriage was associated with poorer outcomes: 26.6% resulted in spontaneous miscarriage (second trimester), 13.4% in FGR, and 20% in preterm birth, with only 40% achieving a full-term birth. This underscores the negative prognostic significance of SCH, which is thought to be evidence of abnormal trophoblast invasion or impaired placental function. Our findings of increased miscarriage and preterm birth with SCH are consistent with the literature, although the specific rates vary. For instance, Maso et al reported different percentages but also indicated adverse outcomes.[19]

Overall, 52% of the pregnancies in our study continued to a viable outcome (live birth, though including preterm and IUGR), while 48% resulted in a non-viable outcome (miscarriages, ectopics, moles). This highlights the substantial risk of pregnancy loss and adverse outcomes associated with first-trimester bleeding. The study emphasizes that factors such as the amount of bleeding, presence of abdominal pain, history of previous miscarriage, and ultrasound findings like SCH are critical in predicting the course of pregnancy.

The management provided was in line with standard protocols, with conservative management for threatened miscarriages and surgical or medical intervention for completed miscarriages, ectopic pregnancies, and molar pregnancies.

This was a single-center study, which may limit the generalizability of the findings. The assessment of bleeding severity was based on patient self-reporting and clinician visualization, which can be subjective. While coagulation profiles were done, detailed analysis of other potential etiological factors (e.g., specific infections, genetic factors, endocrine disorders beyond TSH if not universally tested) for miscarriage was not the primary focus of the presented results. The specific statistical tests used for correlations were not detailed.

Clinical implications and future directions

The findings reinforce the need for careful evaluation and risk stratification of women presenting with first-trimester bleeding. Counselling regarding prognosis should be based on factors like the amount of bleeding, presence of pain, and ultrasound findings. Early booking and access to antenatal care are crucial. Further research could focus on more objective measures of bleeding, the role of newer biochemical markers in predicting outcomes in this specific population, and the long-term maternal health implications following pregnancies complicated by first-trimester bleeding. Identifying modifiable risk factors and

effective interventions for threatened miscarriages with poor prognostic signs remains a key area for investigation.

CONCLUSION

First-trimester vaginal bleeding is a significant obstetric problem strongly associated with adverse pregnancy outcomes. The amount and duration of bleeding, particularly when heavy or accompanied by abdominal pain, are critical predictors of pregnancy loss. While spotting may often have a favorable prognosis, moderate bleeding warrants careful monitoring, and heavy bleeding is almost invariably linked to a poor outcome. The presence of a subchorionic hematoma further compromises the prognosis. This study highlights the importance of comprehensive clinical and ultrasonographic evaluation for risk stratification. Educating women about the significance of their symptoms and providing appropriate counselling can help alleviate anxiety and manage expectations. Enhanced antenatal care, particularly for high-risk groups, and timely, appropriate management are essential to reduce associated maternal and perinatal morbidity and mortality.

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