

# Clinical and Ultrasonographical Evaluation of First Trimester Vaginal Bleeding

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## ABSTRACT

**Introduction:** First-trimester vaginal bleeding is among the most frequent complications in early pregnancy, with variable etiologies ranging from benign to life-threatening conditions. Accurate diagnosis through clinical assessment and ultrasonography is critical for optimizing maternal and fetal outcomes. The objective of the study is to determine the incidence, causes, and outcomes of first-trimester vaginal bleeding through clinical and ultrasonographic evaluation.

**Material and Methods:** A prospective observational study was conducted in the Department of Obstetrics and Gynaecology, Adichunchanagiri Institute of Medical Sciences, Adichunchanagiri University, B.G. Nagara, from June 2023 to December 2024. A total of 100 pregnant women with bleeding per vagina up to 12 weeks of gestation were included. Clinical history, physical examination, and ultrasonography were performed. Data were analyzed using SPSS, with Chi-square tests applied to assess correlations.

**Results:** Most participants were aged 21–30 years, with 56% being multigravida. Abdominal pain was reported by 65%, and 90% had a closed cervical os. Vaginal bleeding was moderate in 45% and severe in 20%, the latter associated with lower hemoglobin levels (mean 7.38 g/dL). Clinically, threatened abortion was suspected in 78% of cases, but ultrasound confirmed only 54%, while additionally diagnosing missed abortion (13%), ectopic pregnancy (9%), blighted ovum (5%), and molar pregnancy (3%). The difference between clinical and ultrasonographic diagnosis was statistically significant ( $p=0.0089$ ). Among threatened abortion cases, 39% resulted in full-term vaginal delivery, 33% in preterm birth, 20% in caesarean section, and 7% ended in abortion.

**Conclusion:** First-trimester vaginal bleeding poses significant maternal and fetal risks. Ultrasonography is indispensable for accurate diagnosis, early intervention, and improving pregnancy outcomes.

**Keywords:** First-trimester bleeding, ultrasonography, threatened abortion

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## INTRODUCTION

First trimester vaginal bleeding is one of the most common and challenging presentations in obstetric practice, affecting up to one in five pregnancies [1]. It is a source of significant concern for patients and clinicians alike, given its wide spectrum of possible etiologies ranging from physiological implantation bleeding to life-threatening conditions such as ectopic pregnancy [2]. The prognostic implications vary considerably, and timely recognition of the underlying cause is essential to safeguard maternal health and optimize pregnancy outcomes [3]. A methodical approach that combines detailed clinical evaluation with the use of ultrasonography remains the cornerstone in differentiating benign from pathological causes of bleeding [4].

The clinical spectrum of first trimester bleeding is broad. Threatened miscarriage accounts for a majority of cases, but clinicians must remain vigilant for other important conditions such as inevitable, incomplete, or missed abortions, molar pregnancy, and ectopic pregnancy [5]. Each of these diagnoses carries unique implications for maternal and fetal prognosis and demands distinct management strategies. For example,

while threatened miscarriage may be managed expectantly with favorable outcomes in many cases, ectopic pregnancy often requires urgent intervention to prevent catastrophic complications [6]. Molar pregnancies, though rare, carry additional risks including persistent trophoblastic disease, underscoring the importance of accurate diagnosis [7].

Modern diagnostic modalities, particularly transvaginal ultrasonography, have significantly enhanced the ability to evaluate women presenting with first trimester bleeding [8]. Ultrasonography provides critical insights into pregnancy location, viability, gestational age, and the presence of abnormalities such as subchorionic hematomas or abnormal trophoblastic tissue [8,9]. When integrated with clinical findings and serial serum hCG measurements, it allows for a more precise categorization of cases and timely intervention. This synergy between clinical examination and imaging is particularly crucial in low-resource settings, where delays in diagnosis can lead to avoidable maternal morbidity and mortality [10].

Despite advances in diagnostic tools, first trimester vaginal bleeding continues to pose a clinical dilemma due to overlapping symptoms and variable presentations. Hence, systematic studies are necessary to better understand its incidence, underlying causes, and associated maternal and fetal outcomes in different populations. The present study was undertaken with the aim of determining the incidence of first trimester vaginal bleeding and to evaluate its causes through clinical assessment and ultrasonographic examination.

## MATERIALS AND METHODS

This prospective observational study was carried out over a period of 18 months, from June 2023 to December 2024, in the Department of Obstetrics and Gynaecology at Adichunchanagiri Institute of Medical Sciences, Adichunchanagiri University, B.G. Nagara, Mandya District. Consecutive sampling was employed to recruit women presenting with complaints of bleeding per vagina in the first trimester of pregnancy. The sample size for the study was estimated using the formula  $N = 4pq/d^2$ , with a prevalence (p) of 12% for first-trimester vaginal bleeding and an allowable error (d) of 12%. The calculated sample size was 100, which was achieved during the study period.

A total of 100 participants were included after fulfilling the eligibility criteria. The inclusion criteria comprised pregnant women with a positive urine pregnancy test, gestational age up to 12 completed weeks, and willingness to undergo ultrasonography. Exclusion criteria were negative urine pregnancy tests, non-obstetric causes of bleeding, gestational age beyond 12 weeks, refusal of hospital-based scan, and unwillingness to participate in the study.

After obtaining written informed consent, data were collected using a pre-structured proforma. Detailed demographic and medical histories were recorded, and clinical examinations, including abdominal and speculum assessment, were performed. Ultrasonography was carried out to evaluate fetal viability, gestational age, and the presence of obstetric complications such as threatened abortion, incomplete abortion, ectopic pregnancy, or molar pregnancy. Weekly follow-ups were conducted during the first trimester to document any changes in symptoms and to assess maternal and fetal outcomes. All findings were systematically recorded to ensure completeness and reliability of data collection.

Data were initially compiled in Microsoft Excel and subsequently analyzed using SPSS software. Descriptive statistics were applied to summarize demographic and clinical variables. Comparative analyses between clinical findings and ultrasonography results were performed using Chi-square tests, regression analysis, and ANOVA as appropriate. A p-value of <0.05 was considered statistically significant, and multivariate analysis was undertaken to identify independent predictors of first-trimester bleeding outcomes.

## RESULTS

Most participants were in the 26–30 year age group (35%), followed by 21–25 years (29%), while only 6% were above 35 years. A majority were housewives (73%), with smaller proportions engaged in jobs (12%), labour (9%), and business (6%). In terms of socioeconomic distribution, most belonged to the upper-lower class (66%), followed by lower class (25%), and a minority (9%) were from the lower-middle class (Table 1).

**Table 1. Demographic Characteristics of Study Participants (n=100)**

Variable	Category	Frequency	Percentage (%)
Age (years)	<20	10	10 %

	21-25	29	29 %
	26-30	35	35 %
	31-35	20	20 %
	>35	6	6 %
Occupation	Housewife	73	73 %
	Job	12	12 %
	Labour	9	9 %
	Business	6	6 %
Socioeconomic status	Lower	25	25 %
	Upper lower	66	66 %
	Lower middle	9	9 %

In the study cohort, 56% were multigravida while 44% were primigravida. Half of the women presented between 7-9 weeks of gestation, whereas 25% each were in <7 weeks and 10-12 weeks groups. Abdominal pain was reported by 65% of participants, and 26% had a palpable uterus on abdominal examination. On speculum assessment, cervical os was closed in 90% of cases, while 10% had an open os (Table 2).

**Table 2. Obstetric and Clinical Presentation of Study Participants**

Variable	Category	Frequency	Percentage (%)
Obstetric score	Primigravida	44	44 %
	Multigravida (2-3)	56	56 %
Period of gestation	<7 weeks	25	25 %
	7-9 weeks	50	50 %
	10-12 weeks	25	25 %
Abdominal pain	Present	65	65 %
	Absent	35	35 %
Per abdomen findings	Uterus palpable	26	26 %
	Uterus not palpable	74	74 %
Per speculum findings	OS open	10	10 %
	OS closed	90	90 %

Vaginal bleeding lasting 1-3 days was most frequent (50%), followed by <1 day (30%) and >3 days (20%). Moderate bleeding was observed in 45% of participants, spotting in 35%, and severe bleeding in 20%. Hemoglobin levels correlated with bleeding severity, being highest in cases with spotting ( $12.17 \pm 0.19$  g/dL), intermediate in moderate bleeding ( $10.09 \pm 0.23$  g/dL), and lowest in severe bleeding ( $7.38 \pm 0.21$  g/dL) (Table 3).

**Table 3. Vaginal Bleeding Characteristics**

Variable	Category	Frequency	Percentage (%)
Duration of bleeding	<1 day	30	30 %
	1-3 days	50	50 %
	>3 days	20	20 %
Severity of bleeding	Spotting	35	35 %
	Moderate	45	45 %
	Severe	20	20 %

Comparison of clinical and ultrasonography (USG) diagnoses revealed significant differences. Threatened abortion was clinically suspected in 78 cases but confirmed in only 54 on USG. Conversely, missed abortion (13 vs 6), complete abortion (9 vs 5), and ectopic pregnancy (9 vs 3) were detected more frequently on USG. Blighted ovum was diagnosed exclusively by USG in 5 cases, while vesicular mole was identified in 3 cases compared to 1 clinically. The association between clinical and USG diagnosis was statistically significant ( $\chi^2 = 17.0854$ ,  $p = 0.0089$ ) (Table 4).

**Table 4. Comparison of Clinical vs USG Diagnosis**

Diagnosis	Clinical (n)	USG (n)
Threatened abortion	78	54
Missed abortion	6	13
Complete abortion	5	9

Ectopic pregnancy	3	9
Incomplete abortion	7	7
Blighted ovum	0	5
Vesicular mole	1	3
<b>Chi-square value</b>	<b>17.0854</b>	
<b>p-value</b>	<b>0.0089 (significant)</b>	

Among women with threatened abortion (n=54), 38.9% delivered at term vaginally, 33.3% had preterm vaginal deliveries, and 20.4% underwent full-term caesarean sections. Abortion occurred in 7.4% of cases. Regarding fetal outcomes, 9.3% developed fetal growth restriction and 5.6% had abruptio placenta, whereas the majority had uneventful outcomes (Table 5).

**Table 5. Maternal and Fetal Outcomes in Threatened Abortion Cases (n=54)**

Outcome	Frequency	Percentage (%)
Maternal Outcome		
Full-term normal delivery	21	38.9 %
Preterm vaginal delivery	18	33.3 %
Full-term LSCS	11	20.4 %
Abortion	4	7.4 %
Fetal Outcome		
<b>Fetal Growth Restriction</b>	5	9.3 %
<b>Abruptio Placenta</b>	3	5.6 %

## DISCUSSION

The present study demonstrated an incidence of first-trimester vaginal bleeding of 3.9%, which is lower compared to previously reported figures by Alassane et al. (8.41%) and Naskar et al. (7.04%) [11,12]. This variation may be attributed to differences in study settings, sample sizes, and inclusion criteria across populations. Nevertheless, the consistent observation that a substantial proportion of pregnancies are affected underscores the clinical importance of this complication in early gestation. The predominance of bleeding among women in the 21–30 years age group in our study parallels the findings of Mishra et al. and Alassane et al., reaffirming that complications in early pregnancy frequently occur within the most fertile reproductive years [11,13]. Additionally, the association of bleeding with housewives and women from lower socioeconomic strata mirrors earlier observations by Naskar et al., suggesting that sociodemographic vulnerabilities may exacerbate risks through delayed healthcare-seeking behavior and limited access to antenatal care.

Clinical evaluation of affected women revealed that abdominal pain (65%) was frequently associated with bleeding, a finding that resonates with Orakzai et al. and Mishra et al., who identified pain as a key symptom of early pregnancy complications [13,14]. Importantly, the correlation between severity of bleeding and hemoglobin levels in the present study highlights the risk of anemia, with severe cases averaging 7.38 g/dL. This aligns with prior evidence that prolonged or heavy bleeding in early gestation can precipitate hematologic instability and adversely affect maternal outcomes [13]. While the majority of cervical os were closed (90%), suggesting threatened abortion in most cases, a minority with open os were at higher risk of pregnancy loss, further emphasizing the value of combining clinical findings with imaging to stratify prognosis and guide management.

Threatened abortion emerged as the most common clinical diagnosis (78%), consistent with the trends reported by Gawade et al. and Mahajan et al. [15,16] However, when compared to ultrasound findings, discrepancies were evident. While threatened abortion was confirmed in 54% of cases, ultrasound identified higher rates of missed abortion (13% vs. 6% clinically) and ectopic pregnancy (9% vs. 3% clinically). Moreover, blighted ovum, undetectable clinically, was newly diagnosed in 5% of cases. These findings underscore the limitations of clinical assessments alone, which are inherently influenced by patient-reported symptoms and examiner interpretation. The statistically significant association between clinical and ultrasound diagnoses ( $p = 0.0089$ ) nevertheless indicates that while clinical suspicion remains useful, ultrasonography provides essential confirmatory evidence and refines diagnostic precision. This corroborates prior research by Mahajan et al. and Gawade et al., who similarly emphasized the indispensability of ultrasound in evaluating first-trimester bleeding [15,16].

Pregnancy outcomes in the current cohort highlight the potential long-term implications of first-trimester bleeding. Among threatened abortion cases, nearly 39% progressed to full-term normal delivery, while one-third culminated in preterm birth, corroborating the adverse impact of early pregnancy bleeding on gestational duration as reported by Naskar et al. [12] The occurrence of complications such as fetal growth restriction (9.26%) and abruptio placenta (5.56%) further illustrates the spectrum of risks associated with early bleeding episodes. The requirement of LSCS in 20.37% of cases underscores how early gestational stress may predispose to delivery-related complications, a trend similarly noted by Naskar et al. [12] Collectively, these findings reaffirm that while a proportion of pregnancies complicated by early bleeding can progress to term, vigilance is warranted due to the significant burden of adverse outcomes for both mothers and neonates.

## CONCLUSION

First-trimester vaginal bleeding is a clinically significant concern in pregnancy, with outcomes influenced by its severity, duration, and underlying cause. This study emphasizes the pivotal role of ultrasonography in early diagnosis, enabling accurate differentiation between conditions such as threatened abortion, incomplete abortion, and ectopic pregnancy, and thereby guiding appropriate management. While many women with threatened abortion achieved full-term deliveries, the increased risks of preterm labor, fetal growth restriction, and pregnancy loss highlight the need for vigilant monitoring and timely intervention. The association of severe bleeding with maternal anemia further reinforces the importance of early correction and nutritional support. Strengthening antenatal care services, particularly for vulnerable groups, along with standardized management protocols and greater public awareness, can markedly improve maternal and neonatal outcomes. Future research should focus on preventive strategies, long-term consequences, and the integration of technology for early detection and follow-up, ultimately contributing to safer pregnancies and reduced complications.

## REFERENCES

1. Hasan R, Baird DD, Herring AH, Olshan AF, Jonsson Funk ML, Hartmann KE. Association between first-trimester vaginal bleeding and miscarriage. *Obstet Gynecol.* 2009;114(4):860-867.
2. Sujana KR, Anusha P, Pranathi L. Ultrasonographic Evaluation of First trimester Vaginal Bleeding: Diagnostic and Clinical Correlations. *Int J Med Pub Health.* 2025; 15 (2); 133-138.
3. Matar M, Yared G, Massaad C, Ghazal K. Vaginal bleeding during pregnancy: a retrospective cohort study assessing maternal and perinatal outcomes. *J Int Med Res.* 2025;53(2):3000605251315349.
4. Paspulati RM, Bhatt S, Nour SG. Sonographic evaluation of first-trimester bleeding. *Radiol Clin North Am.* 2004;42(2):297-314.
5. Sandhu JK, Pahwa S. Identification of the causes of first trimester vaginal bleeding and fetomaternal outcomes in cases with threatened abortion. *Indian J Obstet Gynecol Res* 2025;12(1):90-95.
6. Anant M, Paswan A, Jyoti C. Cesarean Scar Ectopic Pregnancy: The Lurking Danger in Post Cesarean Failed Medical Abortion. *J Family Reprod Health.* 2019;13(4):223-227.
7. Cavaliere A, Ermito S, Dinatale A, Pedata R. Management of molar pregnancy. *J Prenat Med.* 2009;3(1):15-7.
8. Kaur A, Kaur A. Transvaginal ultrasonography in first trimester of pregnancy and its comparison with transabdominal ultrasonography. *J Pharm Bioallied Sci.* 2011;3(3):329-38.
9. Celen S, Dover N, Seckin B, Goker U, Yenicesu O, Danisman N. Utility of First Trimester Ultrasonography before 11 Weeks of Gestation: A Retrospective Study. *ISRN Obstet Gynecol.* 2012;2012:308759.
10. Surampudi K, Gundabattula SR. The Role of Serum Beta hCG in Early Diagnosis and Management Strategy of Ectopic Pregnancy. *J Clin Diagn Res.* 2016;10(7):QC08-10.
11. Alassane K, Souleymane S, Ousmane T, Mosséré C, Kané DM, Cheick BZ, Diaman KA. Contribution of Ultrasonography in the Etiological Diagnosis of First Trimester Bleeding at the Nianankoro Fomba Hospital of Segou, Mali. *Sch J App Med Sci.* 2022; 10:1613-9.
12. Naskar A, Chowdhury R, Saha PK, Das RK. Evaluation of Pregnancy Outcome in Women with First Trimester Vaginal Bleeding: A Longitudinal Study at a Tertiary Care Hospital, Kolkata, India. *Journal of Clinical and Diagnostic Research.* 2022; 16(9): QC11-QC16.
13. Mishra S, Yadav VK, Das R. A descriptive study on ultrasonographic evaluation of first trimester bleeding per vagina in a tertiary care institution in rural bihar. *Int J Acad Med Pharm.* 2024;6(3):735-8.
14. Orakzai ZJ, Awan NM, Khattak N, Rokhan B, Rashid F, Kamran A. Role of ultrasound in first trimester vaginal bleeding: An observational study at a tertiary care hospital in Mardan, Pakistan: Role of ultrasound in first trimester vaginal bleeding. *Pakistan BioMedical Journal.* 2022:242-5.
15. Gawade S, Virmani S. Correlation between clinical and ultrasonographic diagnosis in patients with first trimester vaginal bleeding. *Int J Med Res Rev* 2015;3(10):1188-1192.
16. Mahajan M, Sharma P, Gupta S. Ultrasonographic Evaluation of First Trimester Bleeding and its Clinical Assessment: A Prospective Study. *JMSCR.* 2019; 07 (06): 116-119.