

A DESCRIPTIVE STUDY ON ULTRASONOGRAPHIC EVALUATION OF FIRST TRIMESTER BLEEDING PER VAGINA IN A TERTIARY CARE INSTITUTION IN RURAL BIHAR

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Abstract

Background: First trimester bleeding is common in the emergencies and this vaginal bleeding is a significant concern in pregnancy, affecting a substantial proportion of expectant mothers and posing potential risks to both maternal and fetal health. Accurate diagnosis of the underlying cause of first trimester bleeding is essential for appropriate management and counselling of patients. Ultrasonography has revolutionized the assessment of early pregnancy complications by enabling visualization of the intrauterine and extrauterine structures with high resolution and accuracy. **Materials and Methods:** It was an Institution-based Descriptive study, Study conducted in the Department of Radiodiagnosis, MGM Medical College and LSK Hospital, Kishanganj (Bihar). **Result:** The study population reveals that the majority of patients were within the age groups of 21-25 years (44%). Primiparous women accounted for 18 cases, representing 36% of the total. Multiparous women comprised 32 cases, making up 64% of the total. The majority of cases had bleeding lasting 3-4 days, making up 54% of the total. For viable intrauterine pregnancies, the sensitivity was 83.33%, specificity was 65.63%, positive predictive value (PPV) was 57.69%, and negative predictive value (NPV) was 72.00%. Regarding ectopic pregnancies, the sensitivity was 75.00%, specificity was 97.93%, PPV was 75.00%, and NPV was 96.00%. For non-viable intrauterine pregnancies, the sensitivity was 57.14%, specificity was 81.82%, PPV was 80.00%, and NPV was 68.00%. These values offer insights into the effectiveness of clinical diagnosis in comparison to USG diagnosis across different pregnancy outcomes. **Conclusion:** Vaginal bleeding in the first trimester of pregnancy poses a common obstetric challenge, evoking anxiety and concern among both patients and obstetricians. Ultrasound emerges as a non-invasive, non-ionizing, and readily available diagnostic tool for evaluating patients experiencing first-trimester bleeding.

INTRODUCTION

First trimester bleeding is common in the emergencies and occurs to pregnant women who are 12 weeks or less of amenorrhea.^[1] Spotting is the most common cause of bleeding caused by implantation of the conceptus into the endometrium. The occurrence of first trimester bleeding per vaginam is estimated to be as high as 7% to 24% in early pregnancies.^[2]

First trimester vaginal bleeding is a significant concern in pregnancy, affecting a substantial proportion of expectant mothers and posing potential risks to both maternal and fetal health.

Defined as bleeding occurring up to 13 weeks of gestation, it is often a distressing symptom for pregnant women and prompts urgent evaluation by healthcare providers. The etiology of first trimester bleeding is diverse, ranging from benign causes such as implantation bleeding to more serious conditions like miscarriage, ectopic pregnancy, and gestational trophoblastic disease.^[3]

Accurate diagnosis of the underlying cause of first trimester bleeding is essential for appropriate management and counseling of patients. Ultrasonography has revolutionized the assessment of early pregnancy complications by enabling visualization of the intrauterine and extrauterine

structures with high resolution and accuracy.^[4] Transvaginal ultrasound, in particular, offers superior sensitivity and specificity in detecting gestational sacs, fetal cardiac activity, and other pertinent findings.^[5,6]

However, despite the widespread use of ultrasonography in the evaluation of first trimester bleeding, there is a paucity of literature specifically addressing this issue in the context of tertiary care institutions in India. MGM Medical College, Kishanganj, stands as a prominent tertiary care center, serving a diverse population in Bihar, India. Given its resources and expertise, it presents an opportune setting for conducting a comprehensive study on ultrasonographic evaluation in cases of first trimester vaginal bleeding.

Furthermore, the findings of this study hold the potential to inform clinical practice and contribute to the development of evidence-based guidelines for the management of first trimester bleeding in similar healthcare settings. By elucidating the spectrum of ultrasonographic findings and their implications for maternal and fetal health, this study aims to improve the quality of care provided to pregnant women experiencing first trimester vaginal bleeding.

Aim and Objective

Aim

The aim of this study is to describe the causes of first trimester bleeding in study population with the help of sonography in the setting of a tertiary care center in rural Bihar.

Objectives

The objectives of our study are:

- Assessment of bleeding in the first trimester of pregnancy using ultrasonography to identify its main causes
- Providing a detailed analysis of ultrasonographic findings in pregnant women presenting with first trimester bleeding
- Correlate between ultrasonographic findings and clinical outcomes
- To prognosticate the status of abnormal pregnancies in patients
- To predict the outcome of abnormal pregnancies in patients.

MATERIALS AND METHODS

Type of Study: A descriptive cross-sectional study.

Place of Study: Department of Radiodiagnosis, MGM Medical College and LSK Hospital, Kishanganj (Bihar).

Duration of the study: 16 months (September 2022 to April 2024).

Period of study: September 2022 to April 2024

Study population: Consecutive 50 cases of women presenting with complaint of first trimester bleeding per vagina to the Obstetrics & Gynecology Department, MGM Medical College and LSK hospital Kishanganj and referred to our Department of Radiodiagnosis for imaging evaluation, were studied.

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Inclusion Criteria

Patients with complaint of first trimester bleeding (<12 completed weeks of pregnancy).

Exclusion Criteria

- All non-obstetrical causes of vaginal bleeding.
- All patients with more than 12 completed weeks of pregnancy.
- Non consenting patients or patients left against medical advice.

Study tools:

- Case data sheet and filled up Proforma.
- USG(Machine GE VOLUSON S10).

RESULTS & DISCUSSION

It was Institution-based Descriptive study, Study conducted in the Department of Radiodiagnosis, MGM Medical College and LSK Hospital, Kishanganj (Bihar). Consecutive 50 cases of women were presenting with complaint of first trimester bleeding per vagina to the Obstetrics & Gynecology Department, MGM Medical College and LSK hospital Kishanganj and referred to our Department of Radiodiagnosis for imaging evaluation, were studied. After investigation we have found:

- The majority patients within the age groups of 21-25 years (44%) and 18-20 years (24%). Age groups 26-30 and 31-35 years accounted for 22% and 10% of the cases, respectively. The mean age of the population was 25.00 years.
- Primiparous women accounted for 18 cases, representing 36% of the total. Multiparous women comprised 32 cases, making up 64% of the total.
- Women with amenorrhea duration less than 8 weeks accounted for 7 cases, representing 14% of the total. Those with amenorrhea duration between 8 and 10 weeks comprised the majority with 30 cases, making up 60% of the total. Women with amenorrhea duration greater than 10 weeks constituted 13 cases, representing 26% of the total.
- The majority of cases, 27 in total, had bleeding lasting 3-4 days, making up 54% of the total. Women experiencing bleeding for 1-2 days accounted for 30% cases. Those experiencing bleeding for 5-6 days comprised 12 % cases and a smaller proportion of women, 2 cases in total, reported bleeding lasting 7-8 days, accounting for 4% of the total.
- Out of 50 cases, 58.0% reported the absence of pain abdomen while 42.0% indicated its presence.

- Physical examination findings, 48% of cases had a UT size less than 10, while 52% fell within the range of 10-12. Additionally, the examination revealed that in 96% of cases, the cervix was closed, with only 4% showing partial opening (PO). Regarding the fornices, 88% were found to be free from any abnormalities (FF), while tenderness was observed in 12% of cases.
- In 56.0% of cases, gestational sac (GS) was detected, followed by 42.0% showing Fetal Pole (FP). Furthermore, 36.0% exhibited findings indicative of fetal cardiac activity (FCA), while 24.0% displayed signs of a yolk sac (YS). Additionally, 14.0% showed evidence of subchorionic bleed (SCB), and 12.0% had placental abnormalities. Less amniotic fluid was observed in 6.0% of cases.
- Notable findings include 8.0% of cases clinically diagnosed as ectopic gestation (EG), matching both the USG and final diagnosis percentages. Similarly, incomplete miscarriage (IA) constituted 32.0% clinically, with corresponding percentages of 20.0% by USG and 20.0% as the final diagnosis. Threatened miscarriage (TA) represented the largest clinical category at 52.0%, aligning with 36.0% by USG and 36.0% as the final diagnosis. While there were some discrepancies, overall, the clinical, USG, and final diagnosis findings exhibited considerable consistency.
- Out of 26 cases diagnosed, follow-up revealed 12 cases of normal pregnancy, 5 cases of incomplete miscarriage (IA), 4 cases of complete miscarriage (CA), 2 cases of inevitable miscarriage (In A), 1 case of missed miscarriage (MA), 1 case of hydatidiform mole (HM), and 1 case of anembryonic gestation (AG).
- Ectopic Gestation: All 4 cases diagnosed clinically were correctly identified.
- Incomplete miscarriage: Follow-up of 16 cases showed 5 cases of IA, 3 cases of threatened miscarriage (TA), 3 cases of CA, 2 cases of MA, 1 case of inevitable miscarriage (In AI), 1 case of ectopic gestation (EG), and 1 case of AG.
- Inevitable miscarriage: Out of 2 cases, 1 case progressed to inevitable miscarriage (In A) and 1 case to incomplete miscarriage (IA).
- Missed miscarriage: Follow-up revealed 1 case of missed miscarriage (MA).
- Hydatidiform Mole: 1 case was diagnosed as hydatidiform mole (HM).
- Among cases of viable intrauterine pregnancy, 15 were correctly identified (true positives), while 11 cases were incorrectly classified as positive (false positives), and 3 cases were missed (false negatives). Additionally, 21 cases were accurately classified as negative (true negatives). For ectopic pregnancies, all 4 cases were correctly identified as positive (true positives), with no false positives observed. However, 1 case was missed (false negative), and 45 cases were correctly identified as negative (true negatives). Concerning non-viable intrauterine pregnancies, 16 cases were correctly identified (true positives), with 4 cases incorrectly classified as positive (false positives). Furthermore, 11 cases were missed (false negatives), and 19 cases were accurately classified as negative (true negatives).
- For viable intrauterine pregnancies, the sensitivity was 83.33%, specificity was 65.65%, positive predictive value (PPV) was 57.69%, negative predictive value (NPV) was 87.50%, and accuracy was 72.00%. Regarding ectopic pregnancies, sensitivity was 80.00%, specificity was 100.00%, PPV was 100.0%, NPV was 97.83%, and accuracy was 98.00%. For non-viable intrauterine pregnancies, sensitivity was 59.28%, specificity was 82.61%, PPV was 80.00%, NPV was 63.33%, and accuracy was 70.00%. These values provide insights into the effectiveness of clinical diagnoses in predicting final outcomes.
- 18 cases of viable intrauterine pregnancy were identified correctly (true positives), with no false positives or false negatives, and 32 cases were accurately classified as negative (true negatives). For ectopic pregnancies, no true positives or false positives were identified, but one case was missed (false negative), and 45 cases were correctly classified as negative (true negatives). Regarding non-viable intrauterine pregnancies, one case was correctly identified (true positive), one case was incorrectly classified as positive (false positive), and no cases were missed (false negatives). Additionally, 22 cases were accurately classified as negative (true negatives).
- 18 cases of viable intrauterine pregnancies were correctly diagnosed on ultrasound with zero false positive and zero false negativity with sensitivity, specificity, PPV, NPV and accuracy of 100% each. 80% of ectopic pregnancies were correctly diagnosed with a specificity and PPV of 100% whereas 1 case was missed on sonography with a sensitivity of 80% and NPV of 97.83% with an accuracy of 98%. Of the nonviable pregnancies diagnose on ultrasound were confirmed with a sensitivity and NPV of 100% whereas 1 case of false positive complete miscarriage was made on ultrasound with a specificity of 95.65%, PPV of 96.43% and accuracy of 98%.
- Additionally, 21 cases were accurately classified as negative (true negatives) by both clinical diagnosis and USG. For ectopic pregnancies, 3 cases were correctly identified (true positives) clinically, with 1 false positive and 1 false negative. However, 45 cases were correctly classified as negative (true negatives) by both clinical diagnosis and USG. Concerning non-viable intrauterine pregnancies, 16 cases were correctly identified (true positives) clinically, with 4 false positives and 12 false negatives. Additionally, 18 cases were accurately classified

as negative (true negatives) by both clinical diagnosis and USG.

- For viable intrauterine pregnancies, the sensitivity was 83.33%, specificity was 65.63%, positive predictive value (PPV) was 57.69%, and negative predictive value (NPV) was 72.00%. Regarding ectopic pregnancies, the sensitivity was 75.00%, specificity was 97.93%, PPV was 75.00%, and NPV was 96.00%. For non-viable intrauterine pregnancies, the sensitivity was 57.14%, specificity was 81.82%, PPV was 80.00%, and NPV was 68.00%. These values offer insights into the effectiveness of clinical diagnosis in comparison to USG diagnosis across different pregnancy outcomes.
- In treatment, conservative measures were applied to 60% of cases, with laparotomy performed in 6.0% and dilatation and curettage (D&C) in 34.0%.
- The final outcomes were as follows: 24% of cases resulted in full-term normal delivery (FTND), while termination occurred in 76% of cases.



Figure 1: Missed carriage

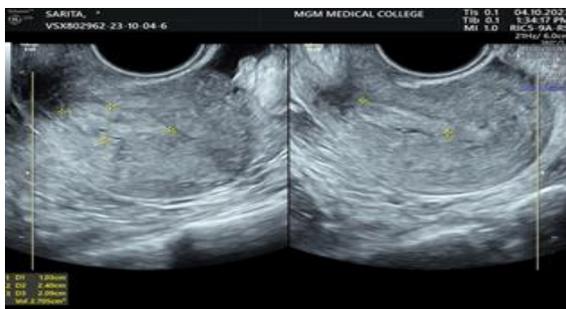


Figure 2: Retained product of conception

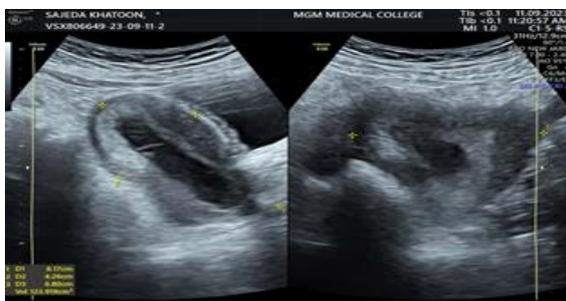


Figure 3: Incomplete miscarriage



Figure 4: Complete miscarriage



Figure 5: Molar pregnancy

CONCLUSION

Vaginal bleeding in the first trimester of pregnancy poses a common obstetric challenge, evoking anxiety and concern among both patients and obstetricians. Clinical history and pelvic examination alone often fall short in determining the underlying cause and prognosis. Common causes of first-trimester bleeding encompass miscarriages, ectopic pregnancy, and molar pregnancy.

Ultrasound emerges as a non-invasive, non-ionizing, and readily available diagnostic tool for evaluating patients experiencing first-trimester bleeding. It offers high accuracy in diagnosing the precise causes of bleeding, guiding clinicians in selecting appropriate management strategies and averting potential mismanagement. Additionally, ultrasound can provide valuable insights for predicting pregnancy prognosis.

In our study, ultrasound accurately diagnosed 48 out of 50 cases, in stark contrast to clinical diagnosis, which correctly identified only 18 out of 50 cases, resulting in a disparity of 64%.

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