



ORIGINAL ARTICLE

Ultrasound and first-trimester vaginal bleeding: A clinical study.

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Article Citation: Khokhar AM, Khan A. Ultrasound and first-trimester vaginal bleeding: A clinical study. Professional Med J 2023; 30(06):747-751. <https://doi.org/10.29309/TPMJ/2023.30.06.7455>

ABSTRACT... Objective: To review the clinical indications and different causes of first-trimester vaginal bleeding by ultrasound. **Study Design:** Cross-sectional study. **Setting:** Department of Radiology, Faisal Hospital, Faisalabad, Pakistan. **Period:** March 2022 to June 2022. **Material & Methods:** A total of 150 female patients aged between 16-45 years with vaginal bleeding in the first trimester (gestational age up to 12 weeks) were included in the study. Clinically tested patients were found to be sent for ultrasound examinations. Both clinical findings and ultrasound were related. The Chi-square test was used to measure the association between vaginal bleeding and gestational age. **Results:** In a study of 150 patients, it was estimated that 105 patients (70%) were pregnant with an assisted ultrasound. However, 80 patients (76%) out of 105, showed a variety of abortions; 32 (40%) were threatened abortion, 28 (35%) were incomplete abortions, 12 patients (15%) had a complete abortion, and 8 patients (10%) had blighted ovum. However, 25 patients (23.8%) out of 105 showed different pregnancies; 15 (14%) patients were pregnant with ectopic and 10 patients (10%) were pregnant orally. **Conclusion:** It was concluded from the study that most cases were in the age group of 21-30 years (39%) as compared to the others. However, 80 cases (76%) were various types of abortions and 105 patients (70%) were multigravida. This study found an association between vaginal bleeding (abortion and ectopic pregnancy) and gestational age (<10 weeks and >10 weeks) which was found to be statistically significant ($p=0.005$).

Key words: First Trimester Vaginal Bleeding, Threatened Abortion, Molar Pregnancy, Ectopic Pregnancy.

INTRODUCTION

Hemorrhage in the first trimester is a common emergency during childbirth and the most common sign of ultrasound during the first trimester.¹ It appears that in 15-25% of all pregnant women, the risk of vaginal bleeding is relatively high.^{2,3} Ultrasonography plays an important role in determining the cause of bleeding in the vagina, its various causes, and the detection of intrauterine or extra-uterine pregnancy.⁴

Three-dimensional (3D) ultrasound and Doppler ultrasound recent advances provide predictive values for assessing pregnancy failure by measuring 3D pregnancy volume and uteroplacental flow, respectively.^{4,5} The first trimester of pregnancy is in the first 12-13 weeks, calculated as starting on the first day of the last menstrual period (LMP).⁶

The advantages of ultrasound imaging include its wide availability, very low cost, and real-time imaging, with high resolution.⁷ Ultrasound is used during the first-trimester to establish gestational age, to detect and evaluate the pregnancy pouch and pregnancy's effectiveness, and in the second-trimester to test the fetus's structure.^{8,9} In addition, it can be used to diagnose ectopic pregnancy, molar pregnancy, RPOC (retained products of contraception), and other pregnancy-related complications.^{4,8}

Bleeding from the vagina is a common first-trimester problem.¹⁰ The causes of first trimester bleeding are classified as obstetric and nonobstetric. Nonobstetrical causes include trauma, cervicitis, vaginitis, cystitis, cervical cancer, and polyps. Obstetric causes include embryonic demise, subchorionic hemorrhage,

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Article received on: 14/02/2023
Accepted for publication: 18/04/2023

an embryonic pregnancy, incomplete abortion, ectopic pregnancy, and gestational trophoblastic disease.^{9,11} Bleeding has been linked to prenatal birth, low birth weight, and infants of pregnancy age.² Inconsistent results have been reported concerning bleeding and birth defects.¹²

The most important findings on ultrasound are the abnormal size of the uterus, abnormal shape, abnormal yolk sac size, low insertion site, bradycardias, and yolk sac size with fetal size.¹³

MATERIAL & METHODS

This cross-sectional study was performed at Faisal Hospital, Faisalabad, Pakistan for a duration of 4 months from March 2022 to June 2022. A descriptive study was performed on 150 female pregnant patients (aged between 16-45 years) having vaginal bleeding referred from OPD for an ultrasound scan via a convenient sampling technique.

However, women having non-obstetric causes for vaginal bleeding in the first trimester of pregnancy were excluded.

Trans abdominal ultrasonography was performed on most patients using a 3.5 MHz frequency transducer. However, an examination of the vagina was performed on 20 patients using a 5-7 MHz transducer for inconsistent detection of abortions.

The data was collected through Performa after explaining the procedure to patients and obtaining their consent. Data were appropriately analyzed by SPSS V22. Results were presented in the form of mean and percentage. The Chi-square test was used to measure the association between vaginal bleeding and gestational age.

This study had no ethical issues because the client was not put on the experiment and no medication was given during the study. However, consent was obtained from the patient. Moreover, the study was duly approved by the ethics committee of Faisal hospital (FIHS), Faisalabad, Pakistan. (FIHS/2022/14)

RESULTS

Data from 150 patients were collected and results were obtained. The age group distribution was 16-45 years while most cases were in the age group of 21-30 years (47%) as compared to the others with the mean age group 26.8 years, which was found to be statistically significant ($p=0.003$). (Table-I).

Age in Years	No of Cases
<20	30 (20%)
21-30	70 (47%)
31-40	40 (27%)
>40	10 (6%)
Total	150 (100%)

Table-I. Age and no of cases.

The majority of patients, 105 patients (70%) were multigravida and 35 patients (30%) were primigravida. Pregnancy at <10 weeks of pregnancy was included in 118 cases (78%) and at >10 weeks 32 cases (22%), which was found to be statistically significant ($p=0.005$). (Table-II).

Gestational Age	No of the Cases (%)	Vaginal Bleeding (Common Finding)
<10 weeks	118 (78%)	Abortion (40%)
>10 weeks	32 (22%)	Ectopic pregnancy (15%)
Total	150 (100%)	

Table-II. Distribution of cases according to gestational ages

In a total of 150 patients, an ultrasound showed active pregnancy with good heart function in 45 patients (30%) who were followed up. Among them, most gave birth on time and a few had abortions during the follow-up period.

Non-viability of pregnancy was seen in 105 patients (70%) out of 150 patients. Among them, 80 patients (76%) showed various types of abortion; 32 cases (40%) may have had no cardiac activity or gestational age did not correspond to the diameter of the bag (MSD) or the length of the crown cluster (CRL) found as threatened abortion, 28 cases (35%) showed an unusual echogenic bag (stored fetal organs) be incomplete abortions, 12 cases (15%) showed

abnormal stiffness or a normal endometrium other than a pregnancy bag diagnosed as a complete abortion, and 8 cases (10%) showed a 25mm bag size outside the fetal cavity found as a blighted ovum. (Figure-1).

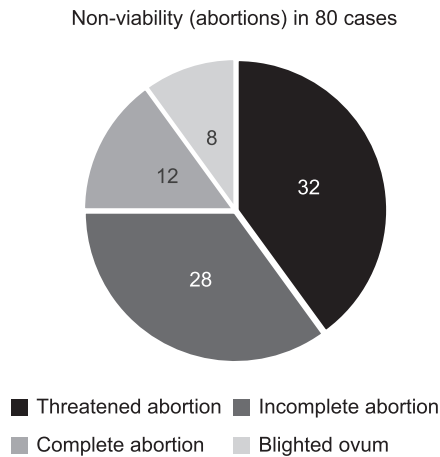


Figure-1. Non-viability of pregnancy in 80 cases

However, 25 patients out of 105 patients showed different pregnancies; 15 patients (14%) were diagnosed with an ectopic pregnancy based on a gestational sac with or without a fetal pole outside the uterine cavity, and 10 cases (10%) were with the diagnosis of an enlarged uterus with a complex cystic endometrial ulcer, typically known as a molar pregnancy. (Figure-2).

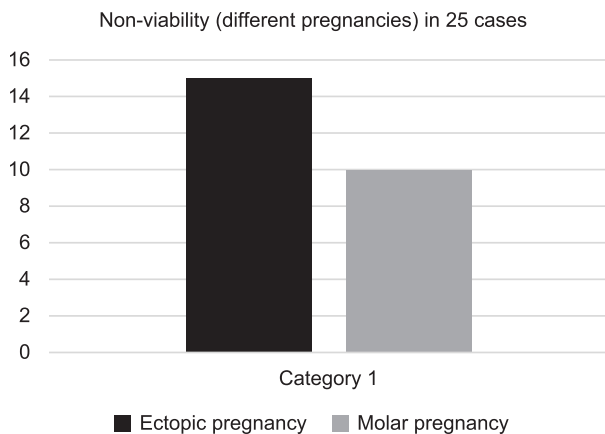


Figure-2. Different pregnancies in 25 cases

In <10 weeks of pregnancy, the most common cause of vaginal bleeding was found to be threatened abortion followed by incomplete abortion. In >10 weeks of pregnancy, the most common cause of vaginal bleeding was an

ectopic pregnancy. And the difference was found to be statistically significant ($p=0.005$).

DISCUSSION

Ultrasound is the first line of reasoning to evaluate the various causes of hemorrhage in the first trimester.¹ Bleeding in the vagina in the first trimester is seen in the first trimester of pregnancy, and half of them end in miscarriage.^{3,9} Ultrasound plays a diagnostic role in confirming and identifying the various causes of bleeding in the first trimester.⁴

In a study conducted by Sumathy KK, in 2019, the age range of the patients was 16-45 years while the most common age group was 21-30 years with a mean of 25.4 years.¹⁴ The results of this study are parallel with the current study, most cases were in the age group of 21-30 years (47%).

In a study conducted by Birla S et al., in 2016, there were 2802 (56%) multigravida deliveries and 2179 (43%) were primigravida deliveries, out of 4981 deliveries.¹⁵ The results of this study well harmonized with the current study as the majority of patients, 105 patients (70%) were multigravida and 35 patients (30%) were primigravida.

In a study conducted by Guena et al., in 2019, it was found that 36 (29.8%) patients were diagnosed with threatened abortions, 27 (22.3%) were diagnosed with incomplete abortions, and 9 (7.4%) cases showed complete abortions.¹⁶ According to a study by Tiparse A et al in 2017, 74 (37%) patients were diagnosed as threatened abortions, 14 (7%) cases were diagnosed as incomplete abortions, and 6 (3%) cases were diagnosed as complete abortions.¹⁷ The results of these studies well correlated with the given study, 32 cases (40%) were threatened abortion, 28 cases (35%) be incomplete abortions, and 12 cases (15%) were diagnosed as complete abortions.

According to a study by Gupta, N et al in 2016, 16 (8%) cases showed an ectopic pregnancy (cystic mass in the uterus in the adnexa usually outside the fetus) and 8 (4%) cases were diagnosed as a molar pregnancy (thick endometrium with

cystic glands).¹⁸ In a study conducted by Aruno et al., in 2018, 3 (3%) cases showed an ectopic pregnancy and 3 (2%) cases were diagnosed as a molar pregnancy.¹⁹ The results of these studies harmonized with the given study as 15 patients (14%) were diagnosed with an ectopic pregnancy, and 10 cases (10%) were diagnosed as a molar pregnancy.

A study by Dogra et al., in 2005 states that abortion and ectopic pregnancy were the two major causes of bleeding in the first trimester of pregnancy.²⁰ A study by Amirkhani et al., in 2012 concluded that the major cause of first trimester vaginal bleeding is abortion and ectopic pregnancy.²¹ The current study showed similar causes of bleeding in the first trimester; abortion and ectopic pregnancy.

CONCLUSION

Ultrasound is the only inexpensive and non-invasive modality that can test, arrive on time and accurately confirm that the pregnancy is labeled as active or inactive. It was concluded from the study that most cases were in the age group of 21-30 years (39%) as compared to the others. However, 80 cases (76%) showed various types of abortions and 105 patients (70%) were multigravida. It was also concluded, an association was found between vaginal bleeding (abortion and ectopic pregnancy) and gestational age (<10 weeks and >10 weeks) which was found to be statistically significant ($p=0.005$). Ultrasound assists and guides the affected physician to properly treat the patient with effective treatment and prevents complications to reduce maternal morbidity and mortality.


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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Abdul Maajid Khokhar	Study concept, Drafting, Data collection, Methodology, Data analysis.	
2	Ayyaz Khan	Data collection, Literature review, Proofreading.	