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Sonographic Findings in Patients with First Trimester Vaginal Bleeding in Aminu Kano Teaching Hospital

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Abstract
Background: Vaginal bleeding in early pregnancy is a common presentation in acute gyneacological settings. Ultrasonography is a popular and faster option for evaluating patients with these conditions. This is because it is a readily available, safe, and non-invasive imaging method for evaluating pregnancies, especially in the first trimester. **Objective:** To assess the sonographic findings in pregnant patients with first-trimester vaginal bleeding. **Method:** This was a cross-sectional descriptive study from patient's record that was presented to the radiology department for a pelvic ultrasound on account of vaginal bleeding in their first trimester pregnancies for the year 2020. A prepared data collection sheet was used to document the sonographic findings for further analysis. Data were analyzed using SPSS version 16 and the results were presented in tables. **Results:** A total of 120 pregnant patients were recruited, with their ages ranging from 17- 47 years. The mean age was 29.59± 6.68 years. Threatened abortion was the common finding (32.5%), followed by complete abortion (30.8%), incomplete abortion (24.2%), missed abortion (5%), and ectopic pregnancy (3.3%). Anembyonic pregnancy had (2%) while inevitable abortion and molar gestation had (1.7%) each. **Conclusion:** Ultrasonography has proven to be a reliable diagnostic tool for patients with the first trimester bleeding Threatened and incomplete abortion were the common sonographic findings. Patients presenting with this clinical indication stand a chance to enjoy the timely results from ultrasound which will facilitate physicians' decision on the next ideal management for better outcomes.

Keywords: *First Trimester, Gestational Age, Sonographic Findings, Vaginal Bleeding.*

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Introduction

The period of the first trimester is accompanied by a series of processes that span from fertilization to early fetal life (Githinji, 2014). First trimester bleeding is any form of vaginal bleeding occurring during the first 12 weeks of pregnancy (Jahan, ., 2018). Bleeding of this form that persisted up to the mid-2nd trimester alerts signs of possible complications (Neossi, et al, 2019). These complications could have either obstetric or non-obstetric causes. Obstetric causes include spontaneous abortion, ectopic pregnancy, and gestational trophoblastic disease. Non-obstetric causes may include malignancy, cervicitis, polyp, cervical erosion, and ruptured varicose vein among others (Jenna & Beth, 2019). Threatened abortion remains the most commonly diagnosed cause of 1st trimester bleeding (Saraswat ., 2010). It is a common complication that affects 16-25% of all pregnancies and it is diagnosed based on documented fetal cardiac activity on ultrasound with a history of vaginal bleeding in the presence of a closed cervix (Saraswat ., 2010, Jenna & Beth, 2019). Reports have ascribed first-trimester bleeding may indicate an underlying placental dysfunction, which may manifest later in pregnancy causing adverse outcomes such as the increased risk of preeclampsia, preterm delivery, preterm pre-labor rupture of membranes (PPROM),

placental abruption and intrauterine growth retardation (IUGR) (Saraswat, ., 2010).

About 25% of all gestations present with vaginal bleeding in the first few weeks of pregnancy, and half of these progress into miscarriage or abortion (Paspulati ., 2014). Bleeding often is self-limited and is most likely caused by the implantation of conceptus into the endometrium (Paspulati ., 2014). The acuity of these symptoms may vary from occasional spotting to severe hemorrhage, associated with cramping and abdominal pain (Paspulati ., 2014). While 50% of women who present with vaginal bleeding in the first trimester of pregnancy will continue to have a viable pregnancy, the event creates significant anxiety for the women which can be managed in different ways (Snell, 2009). Guarded reassurance and watchful waiting are appropriate if the fetal heartbeat is detected, if the patient is medically stable, and if there is no adnexal mass or clinical sign of intraperitoneal bleeding.

However, diagnosis is key in having a better prognosis due to first trimester bleeding. The use of ultrasound as the primary imaging modality in evaluating patients with vaginal bleeding in the first trimester of pregnancy has been emphasized by a number of authors (Jenna & Beth, 2019). As it has not been found to cause any known biological side effects to the fetus at the usual diagnostic frequencies of between 2.5-15MHz (Sahil, ., 2019). The demand for ultrasound in early pregnancy has been increasing steadily and is now a routine investigation for most women within the first trimester of their pregnancy (Sawyer ., 2007). Ultrasound evaluation of the female pelvis is conducted with a real-time scanner preferably using a sector or curvilinear transducer (Paspulati ., 2004). There are different ultrasound approaches in assessing the female pelvis. Using the trans-abdominal approach (TAP), the assessment of the female pelvis is assisted by the presence of a full urinary bladder that acts as an acoustic window and displaces the air containing small bowel loops in the pelvis (Githinji., 2014). The transvaginal approach (TVA) has the advantage of producing images of higher resolution, with early visualization of the gestational sac (GS) a content and earlier identification of embryonic cardiac activity (Githinji, 2014). With TVA, a GS as small as 2-3mm may be visualized corresponding to 4.5-5 weeks of gestation (Jenna & Beth, 2019). Despite the advantages of TVA, its use is limited due to relative invasiveness and conservative socio-cultural factors, especially in the study area.

There is a paucity of documented information regarding the ultrasound (USS) findings in 1st trimester bleeding despite the prevalence in the study area (Iliyasu et al., 2016). The result of this will be of immeasurable value to clinicians in preparedness. Institutionalizing best management courses and classifying high-risk individuals will be of better prognostic value. Its absence is creating a vacancy for informed decisions and future planning. This study, therefore, aims to assess various sonographic findings, maternal and gestational age group(s) mostly associated with first trimester vaginal bleeding in the study area.

Methods

This was a cross-sectional retrospective study using secondary data sources from the archives of the radiology department of Aminu Kano Teaching Hospital (AKTH) from January 2020 to December 2020. The study comprises pregnant women who were in their 1st trimester and referred for pelvic USS due to per-vagina (PV) bleeding. Ethical clearance was approved by the ethics committee of AKTH (NHREC/20/01/2020/AKTH/EC/3016) prior to the commencement of the study. Purposive sampling was used in assessing patients' records that met inclusion criteria. They include patients in their 1st trimester with complete documentation of pelvic USS findings secondary to PV bleeding. Any record with a pregnancy beyond the 1st trimester, absence of complete USS report, or absence of PV bleeding in 1st trimester were excluded. Discrete variables were taken as

counts (or frequencies), while continuous variables (normal distribution) were presented as mean ± standard deviation (SD). The discrete variables were evaluated using the Chi-square test.

Data were collected from the available records and patient's age, gestational age (GA), cervical length and Ultrasound diagnosis on a prepared data capture sheet. Discrete variables were expressed in proportions (frequency and percentage).

Results

A total of 120 patients were recruited. Their ages ranged from 17 to 47years with a mean age of 29.59±6.68 years. Subjects were categorized based on the age group of 10-year intervals. Table 1 shows the distribution of the subjects in age groups. The majority (47.5%) were within the age range of 21-30 years while the least (5%) were within the age range of 41-50 years.

Table 1: *Distribution of subjects based on age group*

Age range(yrs)	Frequency	Percentage
11-20	13	10.8
21-30	57	47.5
31-40	44	36.7
41-50	6	5.0
Total	**120**	**100.0**

The distribution of ultrasound findings was presented based on gestational age groups of 3 weeks intervals. The gestational age group with the highest (50.8%) incidence was 7-9 weeks, while, the least (8.3%) was observed in 10-12 weeks Across the groups, threatened abortion had the highest (32.5%) frequency while the least (0.8%) findings was observed in anembryonic pregnancy (Table 2).

Ultrasound findings were further distributed according to maternal age groups at 10-year intervals. The age group 21-30 years had the highest (47.5%) frequency, while 41-50years was the least (5%). Similarly, across the maternal age groups, threatened abortion still maintains the highest (32.5%) frequency, while anembryonic pregnancy was the least (0.8%) finding (Table 3).

Table 2: *Distribution of ultrasound findings based on gestational age groups*

Ultrasound Findings	Gestational Age group (Weeks)			Total	Percentage
	4-6	7-9	10-12		
Complete abortion	22	14	1	37	30.8
Incomplete abortion	8	18	3	29	24.2
Missed abortion	0	6	0	6	5.0
Threatened abortion	16	17	6	39	32.5
Anembryonic pregnancy	0	1	0	1	0.8
Ectopic pregnancy	1	3	0	4	3.3
Inevitable abortion	2	0	0	2	1.7
Molar gestation	0	2	0	2	1.7
Total: *n*(%)	**49 (40.8%)**	**61(50.8%)**	**10 (8.3%)**	**120**	**100**

Table 3: *Distribution of ultrasound findings based on maternal age groups in years*

Findings	11-20	21-30	31-40	41-50	Total	Percentage
Complete abortion	5	15	15	2	37	30.8
Incomplete abortion	2	14	12	1	29	24.2
Missed abortion	1	3	2	0	6	5.0
Threatened abortion	5	20	13	1	39	32.5
Anembryonic pregnancy	0	0	1	0	1	0.8
Ectopic pregnancy	0	3	1	0	4	3.3
Inevitable abortion	0	1	0	1	2	1.7
Molar gestation	0	1	0	1	2	1.7
Total: ***n***(%)	**13 (10.8%)**	**57 (47.5%)**	**44 (36.7%)**	**6 (5%)**	**120 (100%)**	**100**

Discussion

A number of findings were revealed as causes of 1st trimester PV bleeding in the present study. Eight (8) findings were noted which include: complete abortion, incomplete abortion, missed abortion, threatened abortion, anembryonic pregnancy, ectopic pregnancy, inevitable abortion, and molar gestation. These findings appeared to conform to the findings of the works of Githinji, (2014) in Kenya. These may perhaps be due to the ethnic similarities as both studies were conducted in Africa and among the black racial population.

Of the eight (8) ultrasound findings reported, threatened abortion was having the highest frequency in the present study. This agrees with the works of Neossi ., (2019) in Cameroon who reported threatened abortion as the commonest USS findings. Conversely, Githinji (2014) in Kenya reported incomplete abortion with the highest frequency. The distribution of participants across these studies appeared similar, however, that of Githinji (2014) highlighted the dominance of working-class women in their study. Thus, one possible explanation for the variation in findings of Githinji, (2014), could be due to the greater rigor and physical activity of these women which may predispose them to higher chances of miscarriages. This fact may not be applicable to the participants of Neossi et al (2019) and that of the present study which comprised mainly a heterogeneous population that may presumably be fully dependent housewives.

Subjects of lower age categories were observed with the highest episodes of first-trimester PV bleeding in the present study. This is in contrast with the works of Neossi et al, (2019) who reported older age groups. The normal socio-cultural and religious practices of early marriages among the study participants in the present study may explain this finding. However, in the works of Neossi et al, (2019) their participants are from different geographic, tribal, religious, and cultural settings who normally delay their marriages to later stages in life and majorly constitute reasonable number of the working class may simply explain the contrasting finding.

High-risk fetal age category was revealed between the 7th and 9th weeks gestational age in the present study. Similar gestational age was reported by Neossi et al, (2019) in Cameroon. No obvious explanation for such a finding. However, a number of characteristics were highlighted to be associated to women experiencing vaginal bleeding in early pregnancy. But, their application isn't absolute and should be done with caution. Harville et al., (2003), speculated that women who experienced heavy bleeding usually have a lower risk of bleeding in early pregnancy. Also, those with irregular periods do not have the tendency of experiencing early pregnancy bleeding. Nulliparous women had a lower risk

than multiparous women. Furthermore, observation among female smokers indicates that women who smoke marijuana were related to bleeding in early pregnancy (Harville et al., 2003). However, the present study is limited as all these factors were not considered in the study, and caution should be applied when generalizing this finding.

Conclusion

Threatened abortion, gestational age group between 7th -9th weeks and maternal age between 21-30years were the ultrasound findings, gestational and maternal ages with the highest frequency, respectively. These conditions should be treated with greater suspicion. Physicians could employ bedside ultrasound in attending to patients in the gynaecology emergency ward which could save time and aid patients' diagnosis and management.

Conflict of Interest

The authors declare that there is no conflict of interest throughout the study.

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