

Original Research Article

Spectrum of ultrasonographic findings in gynaecological emergencies in a Nigerian Tertiary Hospital

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ABSTRACT

Background: Gynaecological emergencies are a common cause of morbidity and mortality among women of reproductive age group worldwide and can be life threatening. They can be easily managed if diagnosed early. Ultrasonography (USS) is a readily available and excellent diagnostic tool in the prompt and accurate diagnosis of these conditions. This is a comparative study aimed at evaluating the ultrasonographic findings in gynaecological emergencies and comparing with the clinical diagnosis.

Methods: 400 patients presenting with suspected gynaecological emergencies at the National Hospital, Abuja were evaluated. The USS findings of these patients were recorded and matched with their socio-demographic parameters and the radiological diagnosis was then compared with the clinical diagnosis at presentation.

Results: The mean age of participants was 34.2±7.5 years. Pregnancy related emergencies were the most common, making up 65.8%. Abortion was the most common emergency seen. Pregnancy related cases were commoner in the younger age group 20-39 years. A higher proportion of USS diagnosis for pregnancy related cases (96.7%) corresponded with the clinical diagnosis when compared to a smaller proportion for non-pregnancy related cases (80.6%), and this had significant correlation ($\chi^2=256.12$, $df=1$, $p<0.0001$)

Conclusions: USS evaluation of gynaecological emergencies as seen in this study, allows for quick and accurate diagnosis so that appropriate emergent care can be instituted to improve the outcome in these cases.

Keywords: Ultrasonography, Gynaecological emergencies

INTRODUCTION

Gynaecological emergencies represent a significant burden of disease in the reproductive age group in Sub-Saharan Africa with an increase in mortality and morbidity rates.¹ Gynaecological emergencies represent disease conditions affecting the reproductive organs of females and which may have adverse effects on the reproductive capacity, affect the sexual function and even her very existence.² A common clinical presentation of gynaecological emergencies to emergency departments in

most parts of the world is acute abdominal pain.^{2,3} Clinicians all over the world are faced with a major challenge of the wide range of possible differential diagnosis that must be considered when a patient presents with a gynaecological emergency for assessment.³

In addition to the clinical findings, various imaging modalities are available and play an important role in the evaluation of these patients. Prompt recognition as well as appropriate management are essential to avoid unwanted complications.³

Gynaecological cases make up a sizable proportion of public health burden.¹ They could be classified according to pregnancy status i.e. those that are related to pregnancy and those that are not.¹⁻³ Those that are pregnancy related are those that arise as a result of complications of first trimester gestations and usually before the age of viability, and these include, extra-uterine (ectopic) gestations, abortions (threatened, inevitable, incomplete, complete, missed, septic, spontaneous, habitual and induced), and complications of unsafe abortions.³ The non-pregnancy related gynaecological emergencies include various forms of ovarian accidents, acute pelvic inflammatory diseases, menstrual disorders including dysfunctional uterine bleeding, bleeding gynaecological malignancies, coital laceration and sexual assault.^{1,2}

Abortion is the commonest emergency in the gynaecological emergency departments, with ectopic pregnancy ranking next in developing countries, while in the U.S.A acute pelvic inflammatory disease is the most common gynaecological emergency after abortion.^{1,3}

The common gynaecological emergencies typically present with abdominal pain, abnormal vaginal bleeding or as a combination of both.^{1,4,5}

Most of the available imaging modalities play an important role in aiding clinicians to diagnose acute gynaecological disease and can help medical and surgical treatment where appropriate. Therefore, it is important to interpret the imaging findings based on the clinical features present as well as pregnancy status of the patient.^{1,3}

The first line modality is ultrasonography (USS) in the imaging of gynaecological emergencies since it is readily available.³ It can be done at the bed side. It can be done either transabdominally or transvaginally.⁴ It can demonstrate the pelvic structures to advantage and features of a gestational sac, fluid in the cul-de-sac, retained intracavitary contents, haemorrhagic follicular cysts can all be demonstrated.^{2,4} Ovarian torsion may also be identified using USS and Doppler, although the diagnosis cannot be safely executed based on imaging alone.

Computed tomography (CT) is not routinely employed in diagnosing acute gynaecological condition or cases.³ However, due to similar symptoms and signs with gastrointestinal and genitourinary systems pathology, it is frequently used as an imaging modality.³

Magnetic resonance imaging (MRI) is not frequently utilised during emergencies, but it is an important modality in characterizing findings that are unclear both on USS and CT.^{3,5} It is particularly invaluable in identifying the site of origin of large pelvic masses such as haemorrhagic uterine fibroid degeneration, torsion or prolapse of fibroid masses and in localizing adenomyosis.³

USS either transabdominal or transvaginal is preferred in the imaging of gynaecological emergencies.^{2,3} It is

relatively inexpensive, provides multi planar views and does not use ionizing radiation.^{2,3,5} Abdominopelvic USS requires a full urinary bladder to provide a sonic window. On the other hand, the urinary bladder should be empty for transvaginal USS.⁵

However, USS has a number of limitations such as that, it is operator dependent as its interpretation depends on the expertise and experience of the operator, and image quality varies with the patient's body habitus.^{3,4} Therefore, resolution of images could be poor in obese patients.

The aim of the study was to determine the pattern of presentation and ultrasonographic findings in patients presenting with gynaecological emergencies in a Nigerian tertiary hospital, and also to compare the clinical and ultrasonographic findings in these patients.

METHODS

This was a prospective cross-sectional study carried out in the radiology department of the National Hospital, Abuja, Nigeria. It is a tertiary level hospital located in the Federal Capital City. The study was carried out over a period of 9 months from August 2017 to April 2018 after ethical approval was granted by the Research and Ethical Committee of the Hospital.

A total of 400 women within the age range of (15-60) years who presented to the gynaecology emergency clinics with suspected gynaecological emergencies were recruited into the study, after informed consent was obtained. Stratified random sampling method was used in recruiting the patients.

Inclusion criteria included women who presented with conditions that fulfilled the criteria for diagnosis of gynaecological emergency such as; bleeding per vaginam in pregnant women before age of fetal viability, history of abnormal vaginal bleeding, history of abnormal vaginal discharge, history of acute pelvic pain. No therapeutic intervention prior to recruitment and patients who gave consent.

Exclusion criteria included patients too ill to undergo ultrasound scan investigation, patients who did not give consent and patients who have had previous gynaecological interventions.

Sample size estimation

This study assessed 400 consecutive patients that presented with gynaecological emergencies in the hospital.

This sample size was estimated using the Fischer's formula below.⁶ The formula is used for sample size calculation in cross sectional study.

$$N = Z^2pq/d^2$$

Where, N is desired sample size, z is standard normal deviation at 95% confidence interval is 1.96 (a constant), p is the proportion of the target population estimated to have a particular characteristic, q is 1-P (proportion in the target population not having the particular characteristic), d is degree of accuracy desired, set at 0.05. Using the prevalence rate of 43.8% for gynaecological emergency from previous studies, the proportion (P) is 0.438.¹¹ 10% attrition rate was added to account for incorrect data entry or data loss. Overall, the study population was made up of 400 patients.

Phillips ultrasound scanner HD II XE with a high frequency 4-8 MHz endo-vaginal probe for the transvaginal approach and a 3-5 MHz curvilinear array probe for the transabdominal study.

Procedure

This was clearly explained to the participants. The other ethical issues were clarified such as the safety of the procedure. Thereafter, an informed consent was obtained and details of age, parity, last menstrual period, gestational age (for pregnant subjects), weight (in kilograms), height (in meters) of the patients were measured and recorded. The body mass index was calculated using the formula: weight/(height).² Patients were examined using the transabdominal and or transvaginal approach in one session. For the transabdominal approach, a full bladder was used for evaluation. An empty urinary bladder was used for the transvaginal approach. For the transabdominal scan, all patients were placed supine and the abdomen exposed up to the lower chest as well as to the level of the symphysis pubis. The coupling gel which helps to obliterate the air interface between the probe and the skin was then applied over the abdomen. The ultrasound probe was placed over the lower abdominal region (light or strong pressure) to visualize the uterus and the adnexa. The patient was scanned in the B-mode both in longitudinal and transverse planes. Sagittal images were obtained by scanning in the same plane as the uterus, parallel to its long axis. Transverse images of the uterus were obtained by scanning at right-angles to the sagittal plane. The uterus was examined as well as the adnexal and the pelvis and the potential peritoneal spaces checked for the presence of free fluid. The size and outline of the uterus was assessed as well as the ovaries and the adnexae.^{7,8} For cases where gestation was involved, the gestational sac was examined, by checking the size, outline and regularity as well as its position within the uterine cavity. In all examinations, both longitudinal and transverse planes were employed. The cervix was also examined to assess the cervical length and diameter. For all cases of suspected adnexal mass, Doppler interrogation was done for the masses to appropriately rule in or rule out a torted ovary or ectopic gestation.

For the transvaginal approach, the patients were asked to empty their urinary bladder before being examined. This was done by using the transvaginal probe 4-8 MHz frequency. The patients were asked to undress and were

given a disposable gown to wear. Thereafter, they were asked to lie supine with knees flexed, the thighs adducted, and the feet placed flat on the couch. To prevent cross contamination, a disposable cover (latex sheath) impregnated with gel was placed over the probe. Care was taken to ensure that all air was eliminated from the beam path, and after the patient was reassured, the probe was gradually introduced into the vagina, while monitoring the ultrasound image.^{7,8} Then using the two orthogonal planes, the pelvic structures were examined, as documented above and the findings noted.

Method of data analysis

The data collected were entered on IBM statistical package for the social sciences (SPSS) statistics for windows, version 20.0 (IBM Chicago, Illinois USA. 2011) and analysed. Categorical variables were analysed using the Chi-square test while the continuous variables were analysed using the student T-test. Comparison of gynaecological emergencies with BMI and parity was obtained using analysis of variance (ANOVA). Baseline analysis involved comparing the clinical diagnoses and USS findings. Hypothesis testing was done by use of the Chi square test. Statistical level of $p < 0.05$ was chosen.

RESULTS

A total of 400 patients presenting to the gynaecological emergency department that met the inclusion criteria were enrolled into the study. The mean age \pm SD of the patients was 34.2 ± 7.5 years with an age range of about 15-64 years. More than half of the patients, 226 (56.5%) were within the 30-39 years age group, closely followed by 20-29 years age group, which had a frequency of 21.0%. The least proportion of 0.5% was in the 60-69 years age group (Table 1).

Table 1: Age distribution parameters of the participants.

Age group (in years)	Frequency (N=400)	Percent (%)
<20	13	3.2
20-29	85	21.3
30-39	222	55.5
40-49	66	16.5
50-59	12	3.0
60-69	2	0.5

*Mean age: $34.2(\pm 7.5)$

Two hundred and fifty-one (62.8%) of study participants were multiparous women while 258 (64.5%) were gravid. Majority 338 (84.5%) had regular menstrual cycle (Table 2).

The gynaecological emergencies encountered in this study were grouped into pregnancy-related gynaecological emergencies (PRGEs) and non-pregnancy-related

gynaecological emergencies (NPRGE). Out of the 400 participants enrolled in the study, those with PRGEs were 263 patients (65.8%), while the NPRGEs were made up the remaining 34.2% (Figure 1).

Table 2: Gynaecological profile of participants.

Variable	Frequency (N=400)	Percent (%)
Parity		
Nullipara	134	33.5
Multipara	251	62.8
Grandmultipara	15	3.7
Gravid		
Yes	258	64.5
No	142	35.5
Menstrual cycle		
Regular	338	84.5
Irregular	57	14.2
Post-menopausal	5	1.3

When the patients age was further categorized in relation to whether the gynaecological emergency, they presented with was pregnancy related or not, it was found that the PRGEs was commoner in the younger age group compared to the NPRGEs were found among women of older age groups. This association was found to be statistically significant ($\chi^2=32.865$, $df=5$, $p<0.01$) (Table 3).

Table 3: Association between age and pregnancy-related gynaecological emergencies (PRGEs) and non-pregnancy-related gynaecological emergencies (NPRGEs).

Age (in years)	Relationship of gynaecological emergency to pregnancy, Frequency (%)		Chi-square test
	PRGEs	NPRGEs	
<20	7 (53.8)	6	$\chi^2=32.865$ $df=5$, $p<0.001$
20-29	53 (62.4)	32	
30-39	155 (69.8)	67	
40-49	29 (43.9)	37	
50-59	1 (8.3)	11	
60-69	0 (0.0)	2	

There were more PRGEs than NPRGES found among married women, and the association was statistically significant ($\chi^2=15.143$, $df=2$, $p=0.001$) (Table 4).

From the study, lower abdominal pain 370 (92.5%) was the most common presenting clinical feature among the study participants. This was followed by bleeding per vaginam 284 (71%) and vaginal discharge 128 (32%). Bloody vaginal discharge was reported by 59 (14.8%) of respondents (Table 5). The weights and heights of the respondents and their calculated body mass index (BMI) were analyzed and categorized into normal (18.5–24.9

kg/m²), overweight (25–29.9 kg/m²) and obese (>30 kg/m²).

As shown in Table 6, 182 (45.4%) of the respondents had normal weight while 175 (43.8%) were overweight. Respondents who were obese made up 10.8% of the subjects. There were no respondents who were underweight.

Table 4: Association between marital status and pregnancy-related gynaecological emergencies (PRGEs) and non-pregnancy-related gynaecological emergencies (NPRGEs).

Marital status	Relationship of gynaecological emergency to pregnancy, Frequency (%)		Chi-square test
	PRGEs	NPRGEs	
Single	22 (4.8)	26 (54.2)	$\chi^2=15.143$ $df=2$, $p<0.001$
Married	245 (70.0)	105 (30.0)	
Widowed	0 (0.0)	2 (100.0)	

Table 5: Clinical presentation of study participants.

Clinical features*	Frequency (N=400)	Percent (%)
Lower abdominal pain	370	92.5
**Bleeding per vaginam	284	71.0
Vaginal discharge	128	32.0
Bloody vaginal discharge	59	14.7
Previous surgery	99	24.8

*Multiple responses applied, **mean duration of bleeding PV=4.4 (±0.8) days

Table 6: Comparison between PRGEs and NPRGEs with BMI and parity.

Variable	Type of gynaecological emergency, mean (±SD)		F	P value
	PRGEs	NPRGEs		
BMI	26.01 (3.76)	26.33 (3.918)	0.643	0.423
Parity	1.42 (1.264)	2.11 (1.839)	19.067	<0.001

*F=Analysis of variance (ANOVA)

Threatened abortion and incomplete abortion were the commonest (34% and 18% respectively) gynaecological emergencies observed among study participants based on clinical diagnosis and both were pregnancy-related. The commonest non-pregnancy-related gynaecological emergencies were pelvic inflammatory disease (PID) and ovarian cyst (13.5% and 8% respectively) (Table 7).

The distribution of clinical diagnoses of gynaecological emergencies based on relationship to pregnancy among

respondents was done. It indicated that pregnancy-related conditions were 65.8% while non-pregnancy-related conditions were 34.2%. Threatened abortion and incomplete abortion made up 51.7% and 27.4% of pregnancy-related gynaecological emergencies (PRGEs) respectively. PID and ovarian cyst were the commonest non-pregnancy-related gynaecological emergencies (NPRGEs) with proportions of 39.4% and 23.4% respectively (Table 8).

Table 7: Clinical diagnosis of study participants.

Variable	Frequency (N=400)	Percent (%)
Abortions	231	58.1
Pelvic inflammatory disease	54	13.5
Ovarian cysts	32	8.0
Ectopic gestation	30	7.3
Uterine fibroids	22	5.5
Dysfunctional uterine bleeding	7	1.8
Endometriosis	7	1.8
Post-menopausal bleeding	9	2.3
Ovarian torsion	2	0.5
Others	6	1.5
Total	400	100

Table 8: Categorization of gynaecologic emergencies based on relationship to pregnancy.

Clinical diagnosis	Relationship to pregnancy, Frequency (%)	
	Pregnancy-related (n=263)	Non-pregnancy-related (n=137)
Abortion	231	
Pelvic inflammatory disease		54 (39.4)
Ovarian cyst		32 (23.4)
Ectopic pregnancy	30 (11.4)	
Uterine fibroid		22 (16.1)
Dysfunctional uterine bleeding		7 (5.1)
Endometriosis		7 (5.1)
Post-menopausal bleeding		9 (2.3)
Ovarian torsion		2 (1.)
GTD	2 (0.8)	
Others		6 (1.5)
Total (N=400)	263 (65.8)	137 (34.2)

A statistically significant difference was noted in the mean parity of patients with NPRGEs when compared to those presenting with PRGEs, as there was a higher mean parity for patients with NPRGEs than those with PRGEs (F=19.067, p<0.001) (Table 9).

Comparison of clinical and USS diagnoses of gynaecological emergencies and testing of research hypothesis

A higher proportion of radiological diagnosis for PRGEs (96.7%) corresponded with the clinical diagnosis compared to a smaller proportion for NPRGEs (80.6%). This relationship was statistically significant (X²=256.124, df=1, p<0.0001) (Table 10).

Table 9: Ultrasound diagnoses of study participants.

Variable	Frequency (N=400)	Percentage (%)
Incomplete abortion	93	23.3
Threatened abortion	91	22.8
Pelvic inflammatory disease	54	13.5
Ovarian cyst	32	8.0
Uterine fibroid	21	5.3
Missed abortion	20	5.0
Complete abortion	20	5.0
Dysfunctional uterine bleeding	12	3.0
Ectopic gestation	12	3.0
Blighted ovum	10	10
Ca cervix	8	2.0
Inevitable abortion	5	1.3
*Others	22	5.6

*Others=Normal findings 17, endometrial hyperplasia 2, GTD 2, cervical incompetence 1

Table 10: Comparison of clinical and USS diagnoses of gynaecological emergencies.

Radiological diagnosis	Clinical diagnosis, Frequency (%)		Chi – square test
	PRGEs	NPRGEs	
PRGEs	237 (96.7)	8 (3.3)	X ² =256.124
NPRGEs	30 (19.4)	125 (80.6)	df=1, p<0.0001

There is better comparison between clinical and radiological diagnoses of PRGEs than for NPRGEs. That is, a clinical diagnosis of a PRGE will likely match a radiological diagnosis of the same PRGE than if it was a NPRGE. This is a difference and it is significant because of the p value which was <0.05. The p value is <0.0001.

From Table 10 below, it is shown that USS (radiological) diagnoses of gynaecological emergencies significantly compares with clinical diagnoses. Furthermore, there is higher probability of comparison for PRGEs than NPRGEs (96.7% versus 80.6%).

Thus, ultrasound is a useful tool in assessing the female genital tract and is especially relevant in imaging patients presenting with gynaecological emergencies.

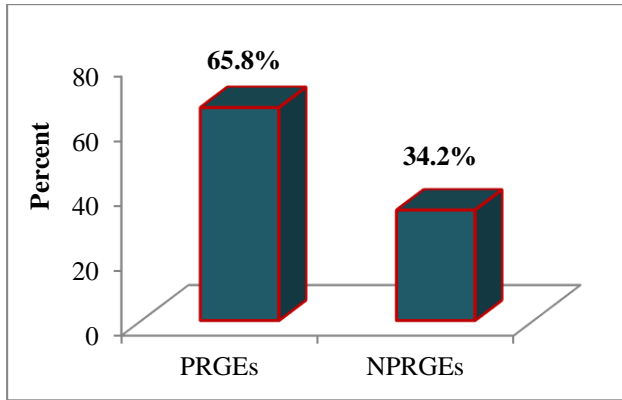


Figure 1: The distribution of pregnancy-related gynaecological emergencies (PRGEs) and non-pregnancy-related gynaecological emergencies (NPRGEs).

DISCUSSION

Gynaecological emergencies are usually life threatening and require prompt attention to save life. Even more important is the fact that most of them are seen in women during early pregnancy, placing the life of the mother, unborn child and the woman’s fertility at risk.⁹

The finding in this study that gynaecological emergencies are seen more in women of reproductive age are consistent with those done by Takai et al reported in Kano in which up to about 80% of the patients were of reproductive age group.¹⁰ Similar findings have also been documented in other parts of the country.^{11,12} The high incidence of gynaecological emergencies in these age groups is due to the fact that these conditions are mostly seen among women of reproductive age group and this age group is the peak reproductive age.

There was a sharp decline in the incidence of gynaecological emergencies beyond 49 years, with about 3.0% recorded in the 50- 59 years age group and only about 0.5% in those >60 years. This is similar to studies done by Takai, Omole-Ohonsi and Oguntoyinbo.¹⁰⁻¹² The number of patients above the 50-year age group was 14 (3.5%) of the study population. Of these, almost all were due to bleeding gynaecological malignancies. This finding was lower than that seen by Ikechebelu et al in Nnewi, Anambra state where 3.5% of the patients had bleeding gynaecological malignancies, and Okafor in Enugu who got a prevalence of 2.3%.^{13,14}

Abortions accounted for 57.3% of all the total number of gynaecological emergencies seen in the emergency department during the study period. Values obtained were largely similar to those done in Kano by Takai et al and in Enugu by Okafor, with only mild variations occurring in the forms of abortion.^{10,14} Variations were seen with the study done by Buowari in Kebbi.¹⁵ There was some variation in the clinical and ultrasonographic findings in the frequency of the forms of abortion seen in this study.

In the index study, with USS diagnosis, incomplete abortion was the most frequent form of abortion seen (40.6%), closely followed by threatened abortion (39%), missed abortion (8.8%), complete (8.6%) and inevitable (2.1%). This is similar to studies done by other authors.^{10,14-17} The high occurrence of abortion among the study population in this study like that seen in other studies is due to the fact that gynaecological emergencies are commoner in the reproductive age group. The most frequently demonstrated finding in the PRGEs was retained products of conception (incomplete abortion), accounting for about 38% of all the USS diagnosis of PRGEs. This was lower than that seen by Takai in Kano who got values as high as 66.3%.⁹ Lower values were obtained by Okafor in Enugu. This result varied from that obtained by Gawade et al and Bhattacharya.^{14,16,18}

Missed abortion made up 13.5% of the diagnosis on USS. This was different from the findings done by other authors where missed abortion made up 22% and 20%.^{16,19} The lower incidence in this study may be attributable to late presentation to the hospital and thus in some of the cases, bleeding would have already ensued and the patients will then present with features of incomplete abortion.

The USS diagnosis of blighted ovum made up 2.5%. This varied with the 12.67% and 12.2% found by Gawade et al and Sofat et al respectively in similar studies.^{16,20} Out of the 72 (27.4%) cases clinically diagnosed as incomplete abortion, more than two-thirds (67%) had similar diagnosis on USS, while complete, inevitable, missed and blighted ovum made up 16.7%, 2.8%, and 5.5% respectively. Similarity in the clinical and USS findings was noted to be higher than the other forms of abortion in the present study. Twenty cases (5%) were diagnosed as complete abortion on USS in this study. Clinically, these cases were diagnosed as complete abortion in 12 patients (60%), incomplete in 4 (20%) cases, threatened in 2 (10%) and ectopic in 2 (10%) cases. This finding varied greatly from the study done by Aronu and his colleagues in a correlation study between clinical and ultrasound diagnosis of first trimester bleeding.²¹ The reason for the poor correlation in his study was due to the fact that most of the patients that presented for ultrasonographic assessment were self- referred for the examination.

Similar findings for ectopic pregnancy (3% USS diagnosis, and 5% PRGEs) in this study were also recorded by Okafor and Dabota with incidence of 4.3% and 5.3% respectively.^{14,15} Higher values were obtained by Gawade 6.7%, Reddi 18.8% and Sofat 18.8%.^{16,19,20} In Benin, Oronsanye got 2.3% in his study, Takai in Kano got 13.2%, Akaba found 2.7% in his study on ectopic pregnancy in Nigeria women.^{10,22,23} In Sokoto, Panti Abubakar got a prevalence of 4.1%.²⁴ However most of the studies with very high incidence considered only ectopic in their study as abortions were not considered.

The high prevalence of ruptured cases of ectopic pregnancy as seen in this study is similar to that in other

centers and has largely been attributed to late presentation.^{9,10,14,23,24} All cases (100%) were tubal in the index study.

Symptomatic presentation of uterine fibroids was seen in 22 (5.5%) patients on clinical evaluation. Almost all the patients (98%) presented with abdominal pain. Of these, 5 (22.7%) were also in their first trimester pregnancy and were also being evaluated for threatened miscarriage. The incidence in this study was lower than that seen in other centers. Okafor found 6.9% in his study and Omole got 19.3% in Kano.^{11,14} The reason for this is mostly due to the fact that Omole only studied non pregnancy related gynaecological emergencies. Uterine fibroid is a benign tumor, arising from the smooth muscles of the uterine wall and it is estrogen dependent. It is commoner in blacks or nulliparous women or those who have not given birth for some time.^{11,12,25-27} Three types of echopattern in the fibroid masses were found in this study with this corresponding to the 3 types of degenerations that have been described by other authors. They include cystic, fatty and calcific. These echo patterns were also described by Okukpe in his study on the ultrasound diagnosis of pelvic masses in Nigerian women. Nzeh et al described similar findings in their study.^{28,29}

A case of clinically diagnosed uterine fibroid had endometrial hyperplasia and subsequent examination by sonohysterography was found to have endometrial polyp. Fibroids are estrogen sensitive benign smooth muscle tumors seen in young women. Acute pain may be caused by degeneration (red degeneration in pregnancy), prolapsed or torsion of a pedunculated fibroid.¹⁴ No case of prolapse or torsion was seen in this study. The least common gynaecological emergencies were bleeding gynaecological malignancies (2%) and hydatidiform moles (0.5%). Bleeding gynaecological cancers seen in this study all involved the cervix. They all had histological confirmation and 75% of them had combination of surgery and chemotherapy. All the patients were post-menopausal and they all presented with vaginal bleeding.

The 2 cases of GTD seen were complete moles on histology. This is the most common presentation as documented in the literature.^{10,12} But it is also possible that some partial moles may be mistaken on USS for abortions.^{1,9,10} No case of sexual assault was recorded in this study. However, what is known is that generally in developing countries, sexual assault is under-reported due to fear of discrimination and stigmatization. The few that eventually present for care do so when there are injuries or fear of becoming pregnant. Okafor in his study in Enugu reported 1.9%, Takai found 5% in Kano, while in Zaria, Ashimi et al found 0.06%.^{10,14,30} In all their studies, the age group affected was <16 years. Lower abdominal pain was the most frequent presenting complaint in both the PRGEs and NPRGEs. It accounted for about 92.5% of the study group. PRGEs had 68.8% while the NPRGEs had 31.2% presenting with lower abdominal pain. Overall, the PRGEs had a higher frequency of the key presentation of pain and

bleeding per vaginam in the index study as well as in literature.^{1,10,12,14,24,31-32}

Limitations

Patients who had very acute conditions and needed to be imaged promptly, were scanned using only the trans-vaginal approach due to inability to achieve adequate bladder filling for a trans-abdominal approach.

CONCLUSION

From the index study, it is shown that USS (radiological) diagnoses of gynaecological emergencies significantly compares with clinical diagnoses. Furthermore, there is higher probability of comparison for PRGEs than NPRGEs. Thus, ultrasound is a useful tool in assessing the female genital tract and is especially relevant in imaging patients presenting with gynaecological emergencies. The main aim of gynaecologic and emergency care services is to quickly identify those patients at high risk which pose a potential threat to their lives or fertility with the goal of management being to preserve the life, fertility and sexual function of the patients.

Recommendations

Ultrasound scan should be the initial tool in the workup of patients presenting with gynaecological emergencies due to its high diagnostic yield, as seen in this study. It should also be done on an emergency basis in order to facilitate prompt intervention and improve outcome. Advocacy regarding the use of contraceptives should be done to reduce the incidence of unwanted pregnancies and therefore abortions. Prevention of pelvic inflammatory disease should also be done. Awareness programmes and increased utilization of the screening tools for pre-malignant and early-stage carcinoma of the cervix should be put in place. Also, there is need for large multicentre study that will allow for applicability of the study to the general population as the study is hospital based.

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REFERENCES

1. Fawole A, Awonuga D. Gynaecological Emergencies in the Tropics: Recent Advances in

- Management. *Ann Ibadan Postgrad Med.* 2011;5(1):12-20.
2. Dagogo SA. Overview of gynaecological emergencies. In: Darwish A editor. *Contemporary Gynaecologic Practice.* Port Harcourt: InTech. 2015;10:33-49.
 3. Roche O, Chavan N, Aquilina J, Rockall A. Radiological appearances of gynaecological emergencies. *Insights into Imaging.* 2012;(3):265-75.
 4. Ramphal SR, Moodley J. *Emergency gynaecology. Best Practice and Research: Clinical Obstetrics and Gynaecology.* 2006;(20):729-50.
 5. Ryan S, McNicholas M, Eustace S. *Anatomy for diagnostic imaging.* 3rd ed. Edinburg: Saunders. 2004;240-7.
 6. Kasiulevičius V, Šapoka V, Filipavičiūtė R. Sample size calculation in epidemiological studies. *Gerontologija.* 2006;7(4):225-31.
 7. Moorthy RS. Transvaginal sonography. *Med J Armed Forces India.* 2000;56(3):181-3.
 8. Lyons EA, Gratton D, Harrington C. Transvaginal sonography of normal pelvic anatomy. *Radiol Clin North Am.* 1992;30(4):663-75.
 9. Takai I, Omeje I. Gynaecological emergencies seen in a referral hospital in Northwest Nigeria: A 3-year retrospective study. *Trop J Obstet Gynaecol.* 2017;34(2):152-9.
 10. Takai UI, Adamu YI, Ifesinachi JO, Ajuluchukwu UE. An Audit of Gynaecological Procedures Performed at Aminu Kano Teaching Hospital, Kano. *J Basic Clin Reprod Sci.* 2015;4(2):64-9.
 11. Omole-Ohonsi A, Mammam M. Value of ultrasonography in the diagnosis of non pregnancy related gynaecological emergencies. *Kanem J Med Sci.* 2007;2(1):7-11.
 12. Oguntoyinbo AE, Aboyeji AP. Clinical pattern of gynecological/early pregnancy complaints and the outcome of pelvic sonography in a private diagnostic center in Ilorin. *Niger J Clin Pract.* 2011;14(2):223-7.
 13. Ikechebelu JI. Prevalence of gynaecological diseases in Nnewi Nigeria. *Niger J Clin Pract.* 2005;8(2):136-7.
 14. Okafor I, Ugwu IA, Agbo FI. Pattern of Gynaecological Emergencies in Enugu State University of Science and Technology Teaching Hospital, Enugu, Southeast, Nigeria. *IOSR J Pharmacy.* 2017;7(1):2250-3013.
 15. Buowari DY. Pattern and outcome of gynaecological emergencies at a Nigerian secondary health care centre. *Internet J Trop Med.* 2010;6(2):1-4.
 16. 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):1188-92.
 17. Okonofua FE. Contemporary obstetric and gynaecology for developing countries. *Women's Health and Action Research Centre. Africal J Reprod Health.* 2004;8(1):106-8.
 18. Iyer LJ, Bhattacharya M. Role of Ultrasonography in early pregnancy complications. *J Postgr Med.* 1992;38:115-6.
 19. Reddi RP, Sunita V. Ultrasonographic evaluation of vaginal blding in the first trimester. *J Obst Gynaec India.* 2000;50:54-8.
 20. Sofat R. Ultrasound evaluation of bleeding in early prgnancy. *J Obst Gynae India.* 1987;37:344-7.
 21. Aronu ME, Okafor CO, Mbachu II, Iloraah SU, Ikeako L, et al. A review of the correlation between clinical diagnosis and ultrasound diagosis in first trimester vaginal bleeding. *Ann Med Heal Sci Res.* 2018;8:120-4.
 22. Oronsaye AU, Odiase GI. Incidence of ectopic pregnancy in Benin-City, Nigeria. *Trop Doct.* 1981;11:160-3.
 23. Akaba GO, Agida TE, Onafowokan O. Ectopic pregnancy in Nigeria Federal Capital Territory. *Niger J Med.* 2012;21(2):241-5.
 24. Panti A, Tanko B, Yakubu A, Egundu S, Ikechukwu N, Lukman O. Ectopic pregnancy at Usmanu Danfodiyo University Teaching Hospital Sokoto: A ten year review. *Ann Niger Med.* 2012;6(2):87-91.
 25. Mary C, Jeremy PR. *Gynaecological imaging.* In: Sutton D ed. *Textbook of radiology and Imaging.* 7th ed. London: Elsevier. 2003;1067-71.
 26. Edward LA. *Obstetric and gynaecological imaging.* In: John HJ, Andrew BC, Janet EK, Lester WP, editors. *Paul and Juhl's Essentials of Radiological Imaging.* 7th edition. Lippincott Williams and Wilkins. 1998;720-32.
 27. Chamberlain G. *Gynaecology by ten teachers.* 17th ed. Britain: Arnold. 2000;100-12.
 28. Okupe RF. The value of real time ultrasound in the diagnosis of pelvic masses in Nigerian women. *Lagos Experience.* *West Afr J Med.* 1980;5:121-7.
 29. Nzeh DA, Komolafe F, Adetoro AA. Ultrasonnd evaluation of pelvic masses in Females. *Niger J Med.* 1988;18:458-60.
 30. Ashimi AO, Amole TG, Ugwa EA. Reported sexual violence among women and children seen at the gynaecological emergency unit of a rural health facility. North west Nigeria. *Ann Med Heal Sci Res.* 2015;15(5):26-9.
 31. Onyebuchi AK, Lawani LO, Nkwo PO, Iyoke CA, Onoh RC, Ajah LO. Determinants of decision-to-intervention time in the management and therapeutic outcome of emergency gynaecological surgeries in south east Nigeria. *Ther Clin Risk Manag.* 2014;10(1):577-82.
 32. Abeshi S, Ago BO, Emechebe CI, Njoku CO. A 5 year review of adolescent gynaecological emergencies in a tertiary hospital in Nigeria. *World J Res Rev.* 2017;5(2):17-21.

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