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Original Research Article

Ectopic pregnancies in low resource setting: a retrospective review of cases in Kumasi, Ghana

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ABSTRACT

Background: Ectopic pregnancy remains a public health threat for women in reproductive age, and a major cause of maternal mortalities in the first trimester of pregnancy. Past studies in Ghana on the burden of Ectopic Pregnancy (EP) have focused on major referral health facilities with little consideration of primary health facilities. This study was set out to determine the prevalence of Ectopic Pregnancy, demographic characteristics involved and the various types of Ectopic Pregnancy seen in primary health settings in Kumasi, Ghana.

Methods: A retrospective descriptive cross-sectional study was conducted at the Suntreso Government and Tafo Government Hospitals in the Kumasi metropolitan area from 2007 to 2017. A review of 28,600 obstetric cases recorded in registers of the two facilities was done using electronic data extraction form. The data were exported into STATA/IC 14.0 for statistical analysis.

Results: A prevalence of 0.76% EP was recorded over the study period of 10 years. 61.75% of the women diagnosed with EP were between the ages of 21-30 years with a mean age and standard deviation of 27.61 and 5.91 respectively. Tubal (fallopian tubes) EP was seen in 76.96% of the women diagnosed with EP. 10.18% and 7.19% of the tubal EP occurred in the cornual and fimbriae respectively. Ruptured EP was seen in 58.99% of the cases.

Conclusions: The study reported EP in about one in a hundred cases. The commonest EP that emerged from this study was tubal (fallopian tube) EP. Among the tubal EP, cornual and fimbria were the commonest EP that occurred in the fallopian tube. Although cases of tubo-ovarian and ovarian EP are rare, a significant percentage were observed in this study. Early reporting and diagnosis of EP should be of great importance to prevent ruptured EP and any associated complications.

Keywords: Ectopic pregnancy, Heterotopic, Low resource setting, Ovarian, Tubal Rupture/Leaking, Tubo-ovarian, Ultrasound

INTRODUCTION

Ectopic pregnancy (EP) remains a global health problem for women in reproductive age. EP can be defined as the

implantation of the fertilized ovum at sites other than the normal endometrial cavity.¹ It is the main cause of maternal morbidity and mortality in the first trimester of pregnancies with more than 98.0% of the condition

occurring in the fallopian (uterine) tube, giving rise to 70.0% ampullary, 12.0% isthmic, 11.0% fimbrial and 2.0%-3.0% interstitial EP.² Between 1970 and 1992, the incidence of EP has been on a rise from 4.5 cases to 19.7 cases per 1000 pregnancies globally.³ In many hospital-based studies in Ghana, the prevalence of EP ranges between 3.3%-10.6%.^{1,4,5} The etiology of EP is poorly understood. However, several risk factors such as Pelvic Inflammatory Disease (PID), smoking, age, tubal surgical history, previous EP, and chromosomally abnormal embryo predisposes an individual to the condition.⁶⁻⁸ A case-control study conducted by Moini et al., (2014), found that factors including previous EP, tubal blockage, use of intrauterine device (IUD), tubal damage, history of infertility, gravidity, prior spontaneous abortion, and first pregnancy interval were associated with the occurrence of EP. Other factors such as previous infections (PID, chlamydia, gonorrhea), infertility, and having multiple sexual partners were mildly associated with the occurrence of EP.⁹ In developed countries such as United Kingdom (UK), the United States of America (USA) and some European countries, the mortality rate of EP has declined due to technological advancement in health including improved ultrasound equipment and techniques, and more sensitive HCG assays.¹⁰ However, in developing countries evidence from hospital-based studies shows a 10-times increase in EP-related mortalities over the years.¹¹ Myriad of factors accounting for the differences observed in the mortality rates between advanced and developing countries include late presentation and diagnosis of the condition, and delayed intervention due to long waiting time at the hospital, limited transfusion requirements and variation in availability of medical surveillance resources, such that most women are diagnosed after rupture and morbidity.¹² Leke et al. (2004), has reported that most women tend to seek care through unprofessional means to treat the condition and this leads to late reporting at the health facilities.¹¹ The clinical signs and symptoms of EP includes abdominal pain, vaginal bleeding, adnexal mass, and amenorrhea.^{1,13} Early reporting and diagnosis of the symptoms after conception help reduces the risk of tubal rupture/leaking and allows for consecutive medical management.¹⁴

Different studies conducted in Ghana on the burden of EP focused on the diagnosis, clinical manifestations and outcomes.^{5,15,16} These studies were done mainly at Teaching Hospitals and other regional hospitals. Depending on the nature of the facilities (that is being referral facilities), the true burden of the problem is likely to be left unreported. Studies conducted on obstetric emergencies in primary health facilities (facilities serving first-line and basic health services) such as that reported in the current study could offer a valuable addition to the scientific understanding of EP in this part of the world. This study therefore sought to determine the prevalence of EP, the demographic characteristics involved and the

various types of EP seen in Kumasi, a low resource setting in Ghana.

METHODS

Study area

The study was conducted at the Kumasi metropolis in Ashanti Region. The Ashanti Region is the third largest of the 16 administrative regions of Ghana with a total projected population of 3,348,062 representing 36.2% of the total population of Ashanti Region.¹⁷ Kumasi is perched between latitude 6.35°N and 6.35°S and longitude 1.30°W and 1.35°E. The total fertility rate for women aged 15-49 years is 2.6. The selected two government hospitals (Suntreso and Tafo Government Hospitals) are primary/secondary health facilities which refer serious cases to the teaching hospital (Komfo Anokye Teaching Hospital) situated in the Ashanti Region.

Study type and design

This study employed a retrospective descriptive cross-sectional study design with a quantitative approach (numbers were reported).

Study population

The study involved women with ultrasound diagnosis of ectopic pregnancy at Suntreso Government Hospital and the Tafo Government Hospital in the period of September 2007 to September 2017 in Ashanti Region of Ghana.

Sampling technique

Simple random sampling technique without replacement was employed to select 2 facilities out of 5 government health facilities in Kumasi. All the 5 health facilities in Kumasi (Tafo Government Hospital, Maternal and Child Health Hospital, Suntreso Government Hospital, Kumasi South Hospital and Kumasi Metropolitan Hospital) were represented with A, B, C, D, and E on pieces of paper respectively, the pieces of the papers were folded and placed in a bowl. The researcher randomly selected 2 facilities. The selected health facilities were Tafo and Suntreso Government Hospitals.

Eligibility criteria

Only cases recorded in the ultrasound register with EP as the basis for ultrasound diagnosis were included in the study at the two health facilities. Both transvaginal and transabdominal ultrasound techniques were used.

Data collection tools and techniques

The data collection tool was developed using well-structured electronic data capturing forms (Open Data Kit

(ODK)). The variables included age, site of ectopic, site of tubal involvement, and condition of ectopic. Data was captured from the medical records of patients diagnosed of EP on the basis of ultrasound diagnosis. The questionnaire was pilot tested in Mankranso Government Hospital in Ashanti Region. Based on the pilot tested results, the data collection tool was modified and validated.

Data analysis

The data captured was then exported to Stata (STATA/IC version 14.0) for statistical analysis. The data were summarized using frequencies and percentages and were presented in tables. The prevalence was estimated by the formula $\frac{\text{Total Ectopic Cases}}{\text{Total Obstetrics cases}}/1000$ pregnancies.

RESULTS

Background characteristics of patients

The 10-year retrospective review of medical records at Tafo and Suntreso Government Hospitals resulted in a recording of 28,600 obstetric cases. Out of these, 217 were diagnosed with Ectopic Pregnancy (EP) thus giving a prevalence of 0.76% (≈ 8 in 1000 pregnancies) EP cases. More than half of the women were between the ages 21-30 years, with a mean age and standard deviation of 27.61 and ± 5.91 years (approximately 28 years and 6 years) respectively. More than half (55.76%) of the EP were seen at the Suntreso Government Hospital (Table 1).

Table 1: Background characteristics of patients.

Variable	Frequency (N=217)	Percentage (%)
Health facility		
Tafo government hospital	96	44.24
Suntreso government hospital	121	55.76
Age (years)		
<21	25	11.52
21-30	134	61.75
31-40	53	24.42
>40	5	2.30
Mean (SD)	27.61 (± 5.91)	

Prevalence, condition, and site of tubal involvement of ectopic pregnancy

Site of ectopic pregnancy

The commonest ectopic pregnancy recorded was tubal (fallopian tube) in 167 (76.96%) of the patients. Ovary, tubo-ovarian, abdominal and heterotopic pregnancy

accounted for 6 (2.76%), 5 (2.30%), 1 (0.46%) and 1 (0.46 %) respectively (Table 2).

Table 2: Distribution of site, condition, and site of tubal involvement of ectopic pregnancy.

Variable	Frequency (n=217)	Percentage (%)
Site of EP		
Tubal	167	76.96
Ovary	6	2.76
Tubo-ovarian	5	2.3
Heterotopic	1	0.46
Abdominal	1	0.46
Not indicated	37	17.05
Condition of EP		
Ruptured	128	58.99
Unruptured	82	37.79
Not Indicated	7	3.23
Site of tubal Involvement (n=167)		
Ampulla	3	1.80
Cornual	17	10.18
Fimbria	12	7.19
Tubal ectopic (site of the tube not specified)	135	80.84

Condition of ectopic pregnancy

More than half, 128 (59.00%) of the patients presented with ruptured or leaking ectopic pregnancy and 82 (38.00%) of the patients presented with unruptured ectopic pregnancy. However, 7 (3.00%) of the patient’s condition was not indicated in the medical health records. (Table 2).

Site of tubal involvement

Ampulla of the fallopian tube accounted for 3 (1.80%) of the tubal EP, cornual accounted for 17 (10.18%), while fimbria accounted for 12 (7.19%). More than three quarters (3/4), 135 (80.84%) of the tubal/fallopian tube EP was recorded, however, the specific site of the tubal/fallopian tube was not indicated in the medical records during the review (Table 2).

DISCUSSION

In the present study, the prevalence of EP was 0.76% (≈ 8 in 1000 pregnancies) and most cases were found in the youth age group of 21-30 years. These findings corroborate that of Baria et al, where a prevalence of 0.70% was found at their facility.¹⁸ A study by Gharoro et al also recorded a low incidence of EP of 1.68% in the Benin city of Nigeria.¹⁹ However, in other studies in Ghana by Opoku et al. and Oppong et al, a higher prevalence of 10.6% and 2.05% respectively was

reported, with women aged between 21-30 years recording the highest.^{1,4} This age group observed in the present study corresponds with the reproductive age and the stages where women are sexually active and tend to get married. This is also consistent with a similar study by Ayinde et al.²⁰ In Ghana, this fertility age is a period most women get married and become mothers or expectant mothers, and hence these findings. As there is a high peak of sexual activity among these age group and the reason for higher incidence/prevalence in this category of women is expected.²¹

The commonest site of EP that emerged from our study was tubal (fallopian tube). Pranathi and Madhavi, Oppong et al., and Tahmina et al have reported a similar findings with tubal ectopic accounting for 92.85%, 96.20% and 94.4% respectively.^{1,22,23} The study further observed that the commonest site of tubal involvement is cornual accounting for 10.18% followed by fimbria and ampulla which accounted for 7.19% and 1.80% respectively. Contrary to the findings of the present study, a study conducted by Chate et al in Nanded in India found ampulla as the commonest (51.61%) part of the fallopian tube where EP occurs.²⁴ A similar finding was also observed in a study conducted by Ganitha and Anuradha, where the majority of the fallopian EP were located in the ampulla.²⁵

Although cases of ovarian and tubo-ovarian EP are very rare, we observed ultrasound diagnosed cases of 2.76% and 2.30% respectively. Ovarian EP has been estimated as 1.00%-3.00% of diagnosed EP, however, the prevalence of ovarian EP varies depending on the population under study. In this current study, about three in hundred cases of ovarian EP was recorded. This finding is almost similar to that reported in a meta-analysis conducted in the UK district general hospital by Odejinmi et al.²⁶

EP's such as abdominal, heterotopic, ovarian and tubo-ovarian pregnancies are rare and it is known to represent 1.00%-3.00% of all EP cases.^{27,28} A similar observation was made in the present study.

Ruptured EP was seen in six out of every ten cases. A similar findings were observed in a study conducted by Latchaw et al. where ruptured and unruptured EP accounted for 59.00% and 41.00% respectively.²⁹ Also, Oppong et al., observed a high prevalence of ruptured ectopic pregnancy.¹ A higher percentage of ruptured EP in this study suggests late diagnosis of EP which is a distinct characteristic in most African countries.^{15,30} This situation is contrary to the situation in the developed countries where detection rates for unruptured EP ranges from 88% to 100%.³¹⁻³³ It is a reflection of the improved use of modern diagnostic techniques in early detection of condition, coupled with enlightenment and awareness on the part of patients.^{20,34}

Early detection of EP before rupture and hemorrhage is of great importance. This prevents life-threatening hemorrhagic shock, excessive tubal damage, and blood transfusion.¹⁵

Limitation of this study

Our study is limited by its retrospective nature. Further, since this study captured data from patients medical records, some variables were missing. To this end we were unable to access other clinical information such as gestational age at presentation, symptoms at presentation/clinical presentation etc. For instance, in some cases patients are allowed to send their medical records folders home due to lack of storage. Regardless of the missing variables, the evidence is useful in policies and programs focusing on improving maternal health outcomes in low resource settings.

CONCLUSION

The study reported a low prevalence of EP (about one in hundred cases) in the study site. The commonest EP that emerged from this study was tubal (fallopian tube) EP. Among the tubal EP, cornual and fimbria were the commonest EP that occurred in the fallopian tube. Although cases of tubo-ovarian and ovarian EP are rare, a significant percentage were observed in this study. Early reporting and diagnosis of EP should be of great importance to prevent ruptured EP and any associated complications.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Committee on Human Research, Publications, and Ethics of the Kwame Nkrumah University of Science and Technology. Administrative clearance was obtained from the Tafo Government Hospital and Suntreso Government Hospital respectively

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