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Ectopic pregnancy in Rivers State University Teaching Hospital, Port Harcourt, southern Nigeria: a five- year review

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Abstract

Ectopic pregnancy remains a dire gynaecological emergency associated with increased morbidity and mortality if not diagnosed and managed promptly. The incidence is increasing among women of reproductive age, and of public health importance. To determine the incidence, yearly trend, common risk factors, clinical presentations, mode and outcome of management of ectopic pregnancy in Rivers State University Teaching Hospital (RSUTH). This is a retrospective study of all cases of ectopic pregnancy managed at RSUTH from 1st January, 2015 to 31st December, 2019. Data was analysed using Statistical Package for Social Sciences (SPSS) IBM version 25.0 (Armonk, NY). Over the study period, there were 13,516 deliveries, 8863 gynaecological admissions, and 279 cases of ectopic pregnancy managed. The incidence of ectopic pregnancy in RSUTH is 2.1% (21/1000 deliveries) or 1 in 47 deliveries. Ectopic pregnancy accounts for 3.2% or 32 per 1000 gynaecological admissions. The mean age of patients was 29.1 SD 5.8 years, (95% CI, 28.5 to 29.8). Majority of the patients 272 (97.5%) and 139 (69.8%) had tubal ectopic pregnancy and tertiary level of education respectively. Tubal pregnancy occurred more on the right tube 176 (63%) compared to left tube 102 (37%). The commonest treatment option was unilateral salpingectomy 276 (98.9%). The mean duration of operation for ectopic pregnancy was 51.3 SD 18.2 minutes, (95% CI, 49.1 to 53.41). Ectopic pregnancy is common and of increasing trend in our setting. Most of the patients presented late with ruptured ectopic pregnancy and its complications. Improved health seeking behaviour, early diagnosis and prompt treatment would improve clinical outcome.

Keywords: Ectopic pregnancy; Heterotopic gestation; Salpingectomy; RSUTH; Nigeria.

1. Introduction

The implantation of a fertilized ovum on a site other than the endometrial lining of a normal uterine cavity is referred to as ectopic pregnancy [1-3]. It is one of the most common gynaecological admissions worldwide and of public health importance [4-6]. Ectopic pregnancy is a gynaecological emergency that is associated with increased morbidity and mortality if not promptly diagnosed and managed appropriately. It accounts for 75% of maternal mortality in early pregnancy [3]. Although ectopic pregnancy can occur in the ovaries, cervix, and abdominal cavity, fallopian tube is the commonest site of occurrence and accounts for about 98% of cases of ectopic pregnancy [1, 4].

The incidence of ectopic pregnancy varies from country to country and among centres [3]. In the United States of America (USA), the incidence of ectopic pregnancy ranges from 1 in 280 to 1 in 241 deliveries [5], with an estimated health care cost of US\$1 billion annually [3]. The incidence is higher in developing countries compared to developed countries [4, 5]. Studies have shown that the incidence is on the increase over the years [2-6]. This may be due to the number of pelvic infections among women of reproductive age group, improved diagnostic technique, and increase in the use of ovulation induction drugs as well as assisted reproductive techniques [2, 3, 6]. Additional contributory factors to the rise in the incidence of ectopic gestation are surgical treatment of tubal disease that predispose to ectopic gestation, the use of effective intrauterine devices that prevent intrauterine pregnancy [7-9]. Others are cigarette

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smoking, history of infertility, previous pelvic surgeries, strenuous physical exercise, and exposure to in utero diethylstilboestrol [10, 11].

The incidence of ectopic pregnancy in South Korea, Jamaica, and Ghana is 1 in 21 deliveries, 1 in 28 deliveries and 1 in 30-43 deliveries respectively [6]. At least a case of ectopic pregnancy is reported every day or alternate daily in Korle Bu Teaching Hospital, Ghana; and accounts for 1 in 30 to 50 deliveries [5]. In Nigeria, ectopic gestation accounts for 4.1 to 5.6% of all gynaecological admissions and contributes to 1.4% of maternal deaths [6]. In Sokoto, Northern Nigeria, it accounts for 1.5 % of births [12]. It is the second most common gynaecological emergency in University of Abuja Teaching Hospital, Nigeria [5]. The risk of ectopic pregnancy among black women and other ethnic minorities is 1.6 fold higher than the risk in white women in United States of America [13].

The clinical presentation of ectopic pregnancy varies, and reflects the biological potential of gestation to develop beyond a very early stage depending on the location [14]. All tubal ectopic rarely develops beyond the early stage and clinical symptoms may present as early as 5 weeks. However, interstitial ectopic pregnancy may have evidence of live embryo and tends to be silent clinically until sudden rupture occurs [6, 12, 13]. This contributed to its associated high mortality, as was noticed in United Kingdom (UK) [6]. Symptoms of ectopic pregnancy are abdominal pain (which is usually a late presentation), vaginal bleeding, nausea, vomiting and diarrhoea- mimicking gastroenteritis. However, with significant haemorrhage from rupture patient may present with typical signs of haemorrhagic shock such as pallor, tachycardia, oliguria and hypotension [3, 6]. It is important to note that assessment of uterine size is rarely helpful and cervical excitation tenderness is not pathognomonic of ectopic [12].

Traditionally, the diagnosis of ectopic pregnancy was made at surgery and confirmed by histology after salpingectomy. The diagnosis of ectopic pregnancy can also be made clinically with high index of suspicion, as well as biochemical tests like serum beta human chorionic gonadotropin (β - hCG), progesterone assay, and radiological, with the use of trans-vaginal and trans-abdominal ultrasound scan [4-6]. In experienced hands trans-vaginal scan is known to detect 75-80% and additional 20-25% of ectopic at initial and follow up examination respectively [6]. Laparoscopy is the regarded as the gold standard for diagnosis; at laparoscopy unruptured ectopic presents as a 'well defined swelling' in the fallopian tube [3, 6]. Studies have revealed that the sensitivity of preoperative ultrasound examination is 87-99% with specificity of 94.0-99.9 %, making ultrasound helpful in the diagnosis of ectopic pregnancy [13-15].

Although rare, the occurrence of both intrauterine and extra-uterine pregnancies known as heterotopic gestation, have been reported [4, 13]. Since the extra-uterine sites are not naturally endowed with the function of supporting a growing pregnancy, with increased growth the embryo, the organ containing it ruptures leading to bleeding and shock. This presents with the attendant complications of ectopic gestation. Thus ectopic pregnancy remains a dire gynaecological emergency in women of reproductive age with high morbidity and mortality [3, 10]. Study on ectopic pregnancy is lacking in our centre. Therefore, this study is aimed at reviewing ectopic pregnancy in Rivers State University Teaching Hospital (RSUTH) over a five- year period to determine the incidence, yearly trend, common risk factors, clinical presentations, mode and outcome of management of ectopic pregnancy.

2. Material and methods

This study was conducted in Rivers State University Teaching Hospital (RSUTH) using patients' case file over the period reviewed. RSUTH was formerly known as Braithwaite Memorial Specialist Hospital (BMSH) and was upgraded to the status of a Teaching Hospital in 2018. The hospital is a tertiary health facility and receives referrals from both private and public hospitals in Port Harcourt and its environs.

This was a retrospective observational study of all cases of ectopic pregnancy managed in RSUTH, former BMSH from 1st January, 2015 to 31st December, 2019. All cases of ectopic pregnancy that presented to accident and emergency unit, and gynaecology clinic were collated as well as cases from the theatre records. The diagnosis was mainly made clinically, from patients' history, examination findings, positive pregnancy test as well as radiological (ultrasound) evidence of ectopic gestation. The total number of deliveries and gynaecological admissions were obtained from the labour ward and gynaecological clinic records/registers. A study profoma was used to record the variables of interest from the patients' hospital folder or case file.

The variables included were the patients' parity, age, level of education, religion, clinical presentations, risk factors (previous history of induced abortion, history of pelvic infection, previous abdominal surgeries, use of contraceptives, and previous history of ectopic pregnancy), type of ectopic pregnancy, site and /or side of occurrence, duration of surgery, type of anaesthesia used, cadre of surgeon and the outcome of management (alive or dead). Ethical approval for the study was obtained from the Hospital's Ethics Committee.

The data was sorted, coded and analysed using IBM Statistical Package for Social Sciences (SPSS) version 25.0 (Armonk, NY). Qualitative variables were summarized using frequencies and percentages, while quantitative variables were summarized using mean, standard deviation and confidence interval where necessary. Categorical and continuous variables were presented in charts and tables.

3. Results and discussion

Over the period reviewed, there were a total of thirteen thousand five hundred and sixteen (13,516) deliveries, eight thousand eight hundred and sixty three (8863) gynaecological admissions, and two hundred and seventy-nine (279) cases of ectopic pregnancy managed. This gives the incidence rate of ectopic pregnancy in RSUTH as 2.1% (21 per 1000 deliveries) or 1 in 47 deliveries. Ectopic pregnancy accounts for 3.2% of all gynaecological admissions or 32 per 1000 gynaecological cases [Table 1]. The rate of ectopic pregnancy increased from 15 per 1000 deliveries in 2015 to 31 per 1000 deliveries in 2019 [Table 1].

Table 1 Yearly trend of ectopic pregnancy in RSUTH

Year	2015	2016	2017	2018	2019	Total
No. of ectopic pregnancy	44	60	50	65	60	279
Total no. of gynaecological admissions	1837	1500	1581	1760	2185	8863
Total no. of deliveries	3020	3495	2747	2294	1960	13516
Rate per 1000 gynaecological cases	24	40	32	37	28	32
Rate per 1000 deliveries	15	17	18	28	31	21

Table 2 Socio-demographic characteristics of the patients

Variable	Frequency (n=279)	Percentage (%)
Age (years)		
<16	1	0.4
16-20	17	6.1
21-25	62	22.2
26-30	91	32.6
31-35	65	23.2
36-40	42	15.1
>40	1	0.4
Mean	SD	95% CI*
29.1	5.8	28.5, 29.8
Parity		
0	153	54.8
1	55	19.7
2	38	13.4
3	16	5.7
4	9	3.2
≥5	4	2.8
Educational status		
No formal	3	1.1
Primary	19	6.8
Secondary	118	42.3
Tertiary	139	69.8
Religion		
Christianity	273	97.8
Islam	6	2.2

SD-Standard deviation *CI- Confidence interval

The ages of patients ranged from 14 to 44 years with mean age of 29.1 SD 5.8, 95% confidence interval (95% CI, 28.5 to 29.8), [Table 2]. The modal age group was 26-30 years accounting for 91 cases (32.6%) followed by age group 31-35 (23.2 %). The parity of the patients ranged from 0 to 6 with modal parity being nullipara (P₀) which accounted for 54.8% of the cases. The rate of occurrence was least among grand-multiparas (2.8%) compared to other parities (97.2%). Majority of the patients had tertiary level of education (69.8%) while 118 (42.3) secondary level of education and only 3 patients (1.1%) had no formal education. Most (97.8 %) of the patients were Christians and 2.2 % were Muslims. Table 2 shows the socio-demographic characteristics of the patients.

Table 3 Types of ectopic gestation

Type of ectopic	Frequency (n=279)	Percentage (%)
Tubal	272	97.5
Ovarian	2	0.7
Abdominal	1	0.4
Heterotopic *	4	1.4

*Combined intrauterine & ectopic pregnancy

From Table 3, the commonest type of ectopic gestation was tubal, accounting for 272 cases (97.5%). Other sites were the ovary and abdominal cavity 3 cases (1.1%). Tubal ectopic pregnancy occurred more in the ampullary part of the tube 196 (72.1%), Isthmus 20 (7.4%), fimbria 18 (6.6%), cornual/interstitial 7 (2.6%). The tubal location of some cases 32 (11.8%) were not specified. Four patients (1.4%) had combined tubal and intrauterine pregnancies. One of the patients that had heterotopic pregnancy carried the intrauterine pregnancy to term having had ectopic surgery (partial left salpingectomy) and delivered a live female baby who is alive and doing well.

Figure 1 shows the findings at operation. Majority of the cases of ectopic pregnancy managed over the period under review were either ruptured 235 (86%) or slowly leaking 25 (9%), while 12 cases (5%) were unruptured cases of tubal ectopic pregnancy.

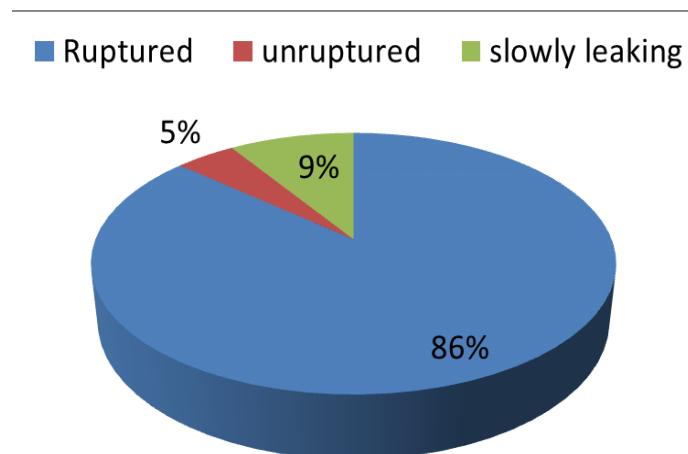


Figure 1 Operation findings

The peak of occurrence of ectopic pregnancy was in 2018 (23.3 %) while the rate was same in 2016 and 2019 (21.5%) respectively [Figure 2]. Ectopic pregnancy occurred more in the right tube 176 (63%) compared to the left tube 102 (37%) [Figure 3]. General anaesthesia was the most common type used 165 (59%) compared to regional 114 (41%) [Figure 4].

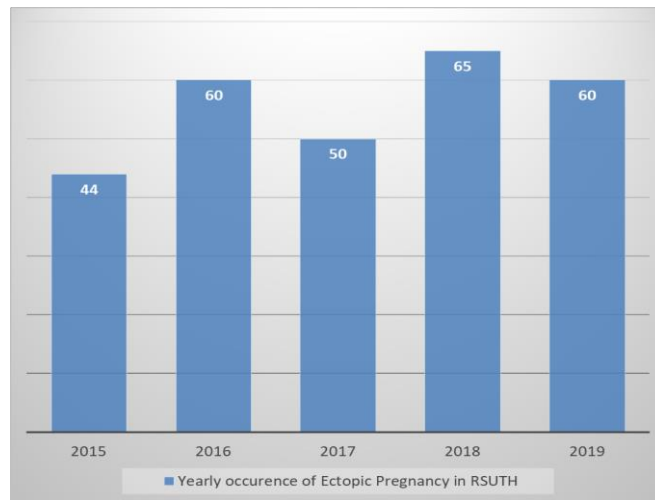


Figure 2 Yearly occurrence of ectopic gestation over the period reviewed

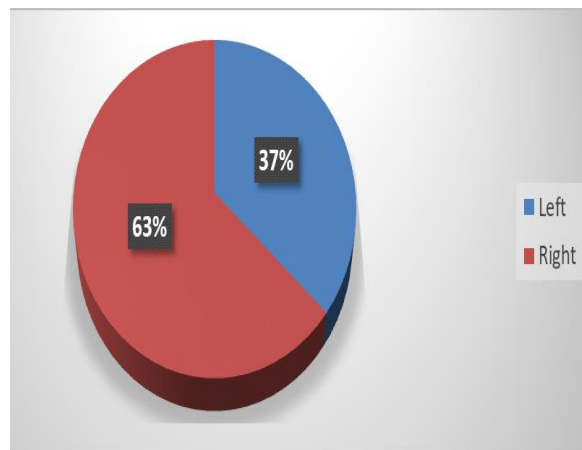


Figure 3 Sides of tubal ectopic pregnancies

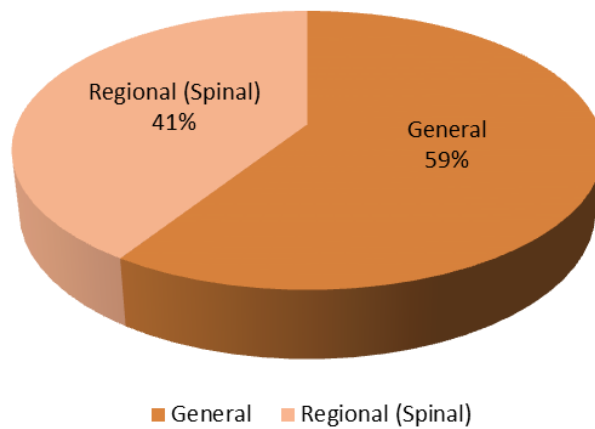


Figure 4 Types of anaesthesia used for operation

Table 4 shows the distribution of the clinical presentations and identified risk factors. Majority 268 (96%) of the patients presented with abdominal pain, followed by amenorrhoea 256 (92%), generalized body weakness 204 (73.1%), vaginal bleeding 148 (53%) and dizziness/fainting spell 128 (45.9%), in decreasing order of occurrence. Some of the patients presented with more than 1 symptom. The risk factors identified in this study were previous history of abortion 254 (91%), pelvic infections 192 (69%), previous abdomino-pelvic surgeries 18 (5.5%), use of contraception 24 (8.6%) and previous ectopic gestation 2 (0.7%) [Table 4].

Table 4 Clinical presentations and identified risk factors for ectopic pregnancy

Presentation	Frequency (n=279)*	Percentage (%)
Abdominal pain	268	96.0
Ameorrhoea	256	92.0
Vaginal bleeding	148	53.0
Dizziness/fainting spell	128	45.9
Generalised body weakness	204	73.1
Risk factors	Frequency (n=279)*	Percentage (%)
Previous history of abortion	254	91.0
Pelvic infection	192	69.0
Abdomino-pelvic surgery	18	6.5
Use of contraception	24	6.8
Previous ectopic pregnancy	2	0.7

*Some patients presented with more than one symptom

From table 5, the mean duration of ectopic surgery in our centre was 51.3 SD 18.2 minutes (95% CI 49.1 to 53.41). Salpingectomy was the commonest treatment procedure performed 276 (98.9%); with partial and total salpingectomy accounting for 86 % and 12.9% respectively. Other modes of treatment were ovarian resection (0.7%) and excision of abdominal ectopic in addition to the use of methotrexate (0.4%). There was no case of salpingotomy, salpingostomy and medical treatment recorded. Most of the procedures were performed by the Registrars under the supervision of the senior registrars and consultants (59.1%). Of the 279 cases recorded, there was a case of mortality from thromboembolism shortly after presentation [Table 5].

Table 5 Treatment options, cadre of surgeons and outcome of management

Variable	Frequency (n=279)	Percentage (%)
Treatment option		
Partial salpingectomy	240	86.0
Total salpingectomy	36	12.9
Ovarian resection/ovariectomy	2	0.7
Excision*	1	0.4
Cadre of surgeons		
Consultant	28	10.1
Senior Registrar	86	30.8
Registrar	165	59.1
Duration of surgery	Mean (SD)#	95% CI+
	51.3 (18.2)	49.1, 53.4
Outcome		
Alive	278	99.6
Dead	1	0.4

*Abdominal ectopic # Standard deviation + Confidence interval

4. Discussion

Over the period reviewed, the incidence of ectopic pregnancy in RSUTH is 2.1% (21 per 1000 deliveries) or 1 in 47 deliveries. This corroborates the findings of 2.1% in Abakaliki [16], and similar to findings from other studies within Nigeria, (2.3%) in Lagos [10] and Benin [17]; but higher than the findings of 1.3% in Nnewi [8] and others [18, 19]. The variation in the incidence across centres within Nigeria could be due to differences in the determinants of the occurrence in the regions.

This study reveals that the rate of ectopic pregnancy has an increasing trend over the review period. The incidence increased from 1.5% in 2015 to 3.1% of all gynaecological cases in 2019. This finding corroborates that of Shobeiri et al. [20] and Santos-Ribeiro et al. [21]. Although increased incidence has been attributed to pelvic infection, multiple sexual partners, early sexual debut, the perceived increase in the rate of ectopic may be true reflection of a larger number of cases in the population as well as improved diagnostic measures available [6]. However, in developing countries the increased incidence is probably due to rising prevalence of chronic pelvic inflammatory disease as a result of pelvic infections from sexually transmitted infections, unsafe abortion and puerperal sepsis [11, 21-23].

Ectopic pregnancy accounted for 3.15% or 31.5 per 1000 gynaecological admissions. This is similar to the findings of Anorlu et al. [10]. However, our finding is lower than the values of 6.3% and 16% reported by other studies respectively [24, 25]. The increased number of ectopic pregnancy cases managed and gynaecological admissions over the period could account for the present rate in this study.

The age of the patients ranges from 14 to 44 years with mean age of 29.1 SD 5.8 (95% CI 28.5 to 29.8). This shows that ectopic pregnancy is common among young women of reproductive age. The narrow confidence interval buttresses the fact that ectopic pregnancy occurs at young age with the true population mean age lying between 28.5 and 29.8 years. Seventy eight percent of cases occurred in young women between the age of 21 and 35 years with the modal age group being 26 to 30 years. This finding corroborates the finding of Abubarka et al. [11] in Sokoto and Ononuju et al. [18] in Lafia Northern Nigeria, where the mostly affected age group was 26 to 30 years respectively, and similar to the findings of, Udigwe et al. [8], Etuknwa et al. [24] and Ugboma et al. [26]. This age group corresponds to the age of prime reproduction and peak of sexual activity with increased risk for ectopic pregnancy.

Nulliparous women 153 (54.8%) were the mostly affected. This is consistent with the findings of studies from other centres, where low parity constituted a high-risk group [11, 25, 27]. Reason being that most young unmarried ladies with unintended pregnancies often procure unsafe abortions, which may predispose them to having future ectopic pregnancy. Additionally, it can be explained that major risk factors of multiple sex partners, previous sexually transmitted infections and abortions precede ectopic pregnancy in a cause effect relationship among nulliparous or women of low parity. Furthermore, Bouzari et al. [1] found an increased risk of ectopic pregnancy in nulliparous women compared to multiparous women.

In this study, majority 268 (96%) of the patients presented with abdominal pain while other symptoms in decreasing order of occurrence were amenorrhoea (92%), generalized body weakness (73.1%), vaginal bleeding (53%) and dizziness /fainting spell (46%). Abdominal pain was the most common presentation, with over 50% of them presenting with amenorrhoea and vaginal bleeding in addition. This corroborates the findings from other studies [11, 27]. The classic triad of ectopic pregnancy includes abdominal pain, amenorrhoea, and vaginal bleeding. Other symptoms identified from the study include generalized body weakness and fainting spell. This is not surprising because majority (84.2%) of the cases had ruptured ectopic pregnancy which was associated with hypovolaemia from severe haemorrhage and its attendant complications. Generally, in rural setting and developing countries, patient with ectopic pregnancies often present late to the hospital for care after patronising patent medicine dealers and spiritualists [25, 27]. This accounts for the increased number of ruptured cases of ectopic pregnancy prior to presentation to hospital for care.

Although a recent meta-analysis revealed that the odds of having an ectopic pregnancy are significantly higher in women with history of pelvic infection, multiple sexual partners, and early age of coitarche [6], the finding from this study showed that the commonest risk factor for ectopic pregnancy was history of previous induced abortion which accounted for 91 % of cases. This finding is also consistent with the recent findings of Odunvbun et al. [23] and John et al. [25]; but lower than 25% reported by Etuknwa et al. [24]. Other risk factors identified in the present study in decreasing order of distribution are pelvic infection (69%), use of contraception (6.8%), previous ectopic pregnancy (0.7). Although in women with previous ectopic pregnancy the risk of recurrence is 12-18% [6] the risk of recurrent ectopic pregnancy from present study is 0.7% and lower than the above range. The retrospective nature of the study design could account for the lower recurrence rate.

The most commonly affected site of ectopic pregnancy was the right tube 176 (63.1%) which is consistent with the findings of other studies [10, 11, 25]. The increased risk of the right tube could be due to the presence of appendix on the right which when inflamed is more likely to affect surrounding tissues and organs. Over 70 % of tubal ectopic occurred in the ampullary region while the cornual/interstitial part of the tube was the least affected site (2.6%). This finding corroborates that of other studies [23-25]. Other sites of ectopic pregnancy are the ovaries, abdominal cavity and cervix. Nevertheless there was no case of cervical ectopic pregnancy in this study.

We recorded four cases (1.4%) of heterotopic ectopic pregnancies, of which one after left salpingectomy carried her intrauterine pregnancy to term and delivered a healthy female baby who is alive and doing well. The other three (75%) cases of combined intrauterine pregnancies had miscarriages in the first trimester. Although heterotopic pregnancy is rare and said to occur in 0.02-0.07 % [28], the present study revealed a higher rate of 1.4%.

The management options for ectopic pregnancies are expectant, medical and surgical. All the patients in this study had emergency exploratory laparotomy for which salpingectomy was done for cases of tubal ectopic pregnancies and ovarian resection and /or ovariectomy for ovarian ectopic and complete excision of abdominal pregnancy. Laparoscopic surgery when indicated can be used for diagnosis and treatment of unruptured ectopic pregnancy [2, 3, 29]. Over the period reviewed, our patients had open surgeries as laparoscopic surgery was not available.

The mean duration of ectopic surgery was 51.3 SD 18.2 minutes, 95% CI 49.1 to 53.4 minutes. To the best of our knowledge, this appears to be the first study to determine the duration of ectopic operation. It is helpful to know that surgery for ectopic pregnancy can be done in less than an hour. Therefore with increasing work load in the hospital, cases of ectopic pregnancy can easily be attended, to save life. Unilateral partial salpingectomy (removal of part of the affected tube, leaving about 5cm or more of the tube in place), was the commonest procedure carried out; accounting for 86.7 % of the ectopic treatment options. This is often the treatment option in the West African sub-region where most of the patients present late with massive intra-peritoneal haemorrhage when 'rupture' had already occurred. Most (84.2%) of the cases had ruptured with haemoperitoneum prior to presentation and commencement of the surgical procedure. This finding is similar to that of other studies within and outside the country [29-31]. In West African sub-region about 99% of cases of ectopic pregnancy present as 'ruptured' cases.

From this study more than 50% of the procedures were carried out by 'Registrars' cadre of staff under the supervision of the Consultants, and Senior registrars. The increased number of registrars at the study period could have accounted for this finding.

The case fatality rate from present study is 0.4%, contrary to the findings of 1.4% in Calabar [24], 8.6% in Lagos Nigeria [10], and 2% in South African [6]. Most serious forms of ectopic pregnancy like the interstitial ectopic pregnancy are usually asymptomatic until sudden rupture occurs leading to increased mortality. At presentation, the women in our centre are immediately wheeled into the theatre for surgery after collecting blood sample for investigations as well as grouping and cross-matching of blood without delay. Blood is transfused intra-operation while the bleeding site is being stopped. This is the way lives were saved in our centre as most of them present late. This measure is really helpful in saving lives and we recommend it especially in low resource settings where patient with ectopic pregnancy present late for care.

5. Conclusion

Ectopic pregnancy is a life-threatening gynaecological emergency associated with high morbidity or mortality. The incidence is high with increasing trend over the period reviewed. Majority of patients in sub-Saharan Africa present late to the hospital for management. As such, massive public health awareness and education on the risk factors for ectopic and good health seeking behaviour would be helpful in curtailing the associated morbidity and mortality with ruptured ectopic pregnancy. A high index of suspicion is key in making prompt diagnosis and treatment which would improve the outcome of management.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors have declared that no competing interests exist.

Statement of ethical approval

Ethical approval was obtained from Hospital's Ethics Committee.

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