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Review of Ectopic Pregnancy as a Cause of Maternal Morbidity and Mortality in a Developing Country

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Abstract: *Ectopic pregnancy is generally on the increase in developing countries and a major cause of maternal morbidity, mortality and fetal wastage. The objectives are to determine the risk factors, pattern of clinical presentation and treatment modalities of ectopic pregnancies in UCTH, Calabar. This is a retrospective study of all cases of ectopic pregnancy managed in our Hospital from 1st January 2010 to 31st December 2014. There were 13,757 deliveries out of which 306 cases were ectopic pregnancies, giving an incidence of 22.2 per 1000 deliveries. Majority, 74.4% were between 21-30 years of age; 73.2% were single and 52.4% were nulliparous. The modal period of amenorrhoea was 8 weeks. Majority presented with ruptured ectopics (92.4%); abdominal pain (92.4%) and amenorrhoea (91.2%). Previous induced abortion (76.8%) and pelvic inflammatory disease (63.2%) were the commonest risk factors observed. Majority of the ectopic pregnancies (95.6%) occurred in the fallopian tube, with the ampulla region of the tube being the commonest site (69.2%). Open laparotomy with salpingectomy was the commonest surgical procedure performed (84.8%). Early detection and intervention are necessary in reducing the associated morbidity and mortality, as well as maintaining the reproductive potential of affected women.*

Key Words: *Ectopic pregnancy, amenorrhoea, morbidity, salpingectomy*

I. Introduction

Ectopic pregnancy is a common life-threatening emergency the world over and its frequency is still high [1,2]. It is the implantation of fertilized ovum at a site other than the normal endometrial cavity of the uterus [1-4]. It remains the commonest life-threatening surgical emergency in gynaecology especially in the tropics where most patients present with the ruptured variety. Hence, it is an important cause of maternal morbidity and mortality in the first trimester of pregnancy; accounting for almost 10% of all maternal deaths [1,2,5].

Ectopic pregnancy can be classified with respect to the site of implantation as tubal, in more than 95% of cases; Others sites account for less than 5% of cases and includes cervical, ovarian, and abdominal ectopic pregnancies [5,6].

Though the global incidence of ectopic pregnancy has been rising during the last three decades [2,4]. The reported incidence varies worldwide depending on the risk factors predominant in the geographical region [2-5]. In most of Europe and North America, the incidence of ectopic pregnancy has tripled over the last 30 years [7,8,9]. It is common in the developing countries due to the high rates of pelvic infections, unsafe abortions and puerperal sepsis [6-12]. In Nigeria, the reported incidence is 0.9-4.38% [13,14] and in USA, it was 0.64 % in 2010 [15].

Multiple factors contribute to the relative risk of ectopic pregnancy, although some patients may not have any risk factor and yet develop ectopic pregnancy [6]. In theory, anything that hampers or delays the migration of the embryo to the endometrial cavity could predispose women to ectopic pregnancy. Reported important aetiological factors for ectopic pregnancy include pelvic inflammatory disease (PID), post-abortal sepsis, puerperal sepsis, previous ectopic pregnancy, previous pelvic surgery and intra-uterine contraceptive device use [5-8]. Other risk factors include history of infertility and congenital defects of the fallopian tubes. Among women undergoing invitro fertilization and embryo transfer, retrograde embryo migration into diseased tubes is believed to be the main cause [16,18-20].

The clinical presentation of ectopic pregnancy is variable with pelvic or abdominal pains in almost all cases. Secondary amenorrhoea and abnormal vaginal bleeding; dizziness, and/or syncope are present and represent advanced stages of intra-peritoneal haemorrhage following rupture [1-6]. Ruptured ectopic pregnancy leads to acute onset of abdominal pains and cardiovascular collapse, and without prompt intervention, can invariably lead to death [17].

Reported mortality rates range from 2.6% in Port Harcourt [21], to 6.5% in Ilorin [14]; and relatively lower maternal mortality rates in the United Kingdom and United States of America [4,16].

Ectopic pregnancy can be treated surgically or non-surgically depending on whether it is ruptured or not [17]. The clinical state and reproductive wish of the patient, site of the ectopic gestation, as well as the

facilities available at the centre can influence the treatment option [8,17]. However, surgical treatment still remains the norm [8]. The development of sensitive beta-human chorionic gonadotropic hormone (B-hCG) assays, along with the increasing use of ultrasound and laparoscopy has improved the management of ectopic pregnancy by making early diagnosis and the potential for future fertility through conservative management [4,17]. In our environment, we are challenged by poor diagnostic tools, limited capacity to handle emergencies and consequent burden of increased maternal morbidity and mortality with consequent reproductive failure [8, 22, 23].

The aim of the study is to determine the pattern of clinical presentation, treatment modalities and outcome of ectopic pregnancies in UCTH, Calabar. The findings would help to improve the current ectopic pregnancy situation in the country and reduce maternal morbidity and mortality from ectopic pregnancy.

II. Materials And Methods

This is a retrospective study of all cases of ectopic pregnancy managed at the University of Calabar Teaching Hospital (UCTH), Calabar, Nigeria, between 1st January, 2010 and 31st December, 2014. The names and hospital numbers of all cases of ectopic pregnancy in the hospital over the 5-year period were obtained from the gynaecology ward and operating theatre registers. Data on total deliveries was also obtained from the labour ward delivery register over the five-year period of study. The case notes of 250 patients managed for ectopic pregnancy were retrieved from the Medical Records Department of the hospital. The remaining 56 case notes were either not found or had incomplete information and were therefore excluded from the study. The information obtained included the demographic and biosocial parameters of the patients, risk factors, clinical features, findings at laparotomy and type of surgical treatment. The data were analysed using the SPSS 11.0 statistical software.

III. Results

There were a total of 306 cases of ectopic pregnancy out of 13,757 deliveries over the 5-year period under review. This gives an incidence of 2.22% of total deliveries. This constituted 9.45% of all gynaecological admissions. The trend revealed an annual increase of 55 cases of ectopic pregnancy in 2010 with a progressive rise to 67 cases of ectopic pregnancy in 2014.

Table I: Sociodemographic Characteristics Of Patients With Ectopic Pregnancy

AGE (YEARS)	**FREQUENCY**	**PERCENTAGE (%)**
≤ 20	23	9.20
21-25	102	40.80
26-30	84	33.60
31-35	29	11.60
36-40	12	4.80
MARITAL STATUS	**FREQUENCY**	**PERCENTAGE (%)**
Single	183	73.2
Married	67	26.8
LEVEL OF EDUCATION	**FREQUENCY**	**PERCENTAGE (%)**
Primary	32	12.8
Secondary	167	66.8
Tertiary	51	20.4
OCCUPATION	**FREQUENCY**	**PERCENTAGE (%)**
Student	72	28.8
Trader	96	38.4
Housewife	38	15.2
Worker	44	17.6
PARITY	**FREQUENCY**	**PERCENTAGE (%)**
0	131	52.40
1	56	22.40
2	35	14.0
3	12	4.80
4	11	4.40
5 and above	5	2
TOTAL	**250**	**100%**

Table I shows the socio-demographic characteristics of the patients with ectopic pregnancy. The mean age was 25.5 ± 4.8 years with a range of 16 to 40 years. The highest incidence of 102 (40.8%) cases was recorded in 21-25 years age group followed by 84 (33.6%) cases in the 26-30 years age group. The least incidence occurred among women between 36-40 years of age, 12 (4.8%). One hundred and eighty three patients (73.2%) of the study population were single. Majority (66.8%) had secondary education while 32 (12.8%) patients had primary education. A majority of the patients were traders (38.4%) and students (28.8%).

Nulliparous patients were the largest group with 131 (52.4%) cases while grand multiparous patients constituted only 2.0% of the study population.

Table II: The Risk Factors Associated With Ectopic Pregnancy.

Risk Factors	Frequency	Percentage (%)
Previous induced abortion	192	76.8
Pelvic Inflammatory Disease	158	63.2
Previous abdominopelvic surgery	25	10
• Caesarean section	11	4.4
• Tuboplasty	1	0.4
• Appendicectomy	9	3.6
• Myomectomy	4	1.6
Age > 35 years	12	4.8
Previous puerperal sepsis	11	4.4
History of Infertility	28	11.2
Use of IUCD	4	1.6
Use of Progesterone only contraceptive	10	4
Previous ectopic pregnancy	9	3.6
None	33	13.2

The commonest risk factor was previous induced abortion which occurred at least once in 192 (76.8%) patients, followed by previous pelvic inflammatory disease in 158 (63.2%) cases. A previous abdominopelvic surgery was observed in 25 (10%) cases while 9 (3.6%) patients had a previous ectopic pregnancy. Thirty three (13.2%) patients had no identifiable risk factor (Table II).

Table III: Clinical Features And State Of Ectopic Pregnancy

	FREQUENCY	PERCENTAGE (%)
Clinical features		
Lower abdominal pain	231	92.4
Amenorrhoea	228	91.2
Abnormal vaginal bleeding	220	88
Nausea/Vomiting	32	12.8
Diarrhoea	16	6.4
Fainting spells/Dizziness	164	65.6
Shoulder-tip pain	14	5.6
Pallor	219	87.6
Features of shock	72	28.8
Abdominal tenderness	226	90.4
Positive cervical excitation tenderness	194	77.6
Fullness/bogginess of the pouch of Douglas	68	27.2
Palpable adnexal mass	13	5.2
State of ectopic pregnancy		
Ruptured	229	91.6
Unruptured	21	8.4

The clinical features of patients presenting with ectopic pregnancy and the state of the pregnancy at presentation are shown in table III. Majority of the patients presented with lower abdominal pain (92.4%). Hypovolaemic shock was present in 28.8% patients. The commonest signs elicited were abdominal tenderness and pallor. Some patients have multiple risk factors.

Table IV: Sites Of Ectopic Pregnancy, Type Of Surgical Management And Blood Transfusion Options.

Site Of Ectopic Pregnancy	Frequency	Percentage (%)
FALLOPIAN TUBE	239	95.6
• Ampullary	161	64.4
• Isthmic	43	17.2
• Fimbrial	21	8.4
• Cornual/interstitial	14	5.6
Ovarian	9	3.6
Abdominal	2	0.8
TOTAL	250	100%
SURGICAL PROCEDURE		
Unilateral salpingectomy	218	87.2
Cornual resection	14	5.6
Unilateral salpingo-oophorectomy	7	2.8
Unilateral oophorectomy only	9	3.6
Laparotomy for abdominal ectopic pregnancy	2	0.80
TOTAL	250	100
BLOOD TRANSFUSION		
Autologous	103	41.2
Homologous	69	27.6
TOTAL	172	68.8

Out of the 239 recorded cases occurring in the fallopian tube, 161 (64.4%) cases occurred in the ampullary region as in table IV. All the cases in the study population were managed surgically by open laparotomy including the 21 (8.4%) cases which were unruptured. Salpingectomy of the affected tube was the commonest procedure performed, 218 (87.2%). A total of 172 (68.8%) patients had blood transfusion, out of which 103 (41.2%) had autologous transfusion. No case fatality was recorded over the duration of study.

IV. Discussion

The incidence of ectopic pregnancy in this study is comparable to 2.31% in Lagos, Nigeria [6]. Lower incidences of 1.81% and 1.14% were reported by Airede et al [1] and Onwuhafua et al [7], respectively in Sokoto and Zaria, Nigeria.

The incidence depends on the population studied and ranges from 1% in rural general practice to 13% in urban emergency departments [13]. These differences may be due to variations in the level of improved diagnostic techniques, advances in assisted reproductive technology and tubal surgeries as obtainable in the developed world. Furthermore, variations in the prevalence of risk factors like sexually transmitted infections (STIs) and chronic pelvic inflammatory diseases (PID), use and pattern of contraception among other factors, may also account for these differences in incidence of ectopic pregnancy [5,6,24].

The peak age incidence of ectopic pregnancy in this study was amongst women in the age group of 21-30 years, which was similar to Nigerian studies in the Niger delta [24], Udigwe et al in Nnewi [8], and Oloyode et al in Sagamu [11]. The high fertility potential and peak sexual activity of this age group has been cited as one of the reasons for the higher incidence in this category of women [14]. Also, the incidence in this study was higher amongst single women (73.2%), traders (38.4%) and students (28.8%). This is similar to findings reported in Uyo, Nigeria [15], where 51.4% were single women and 52.8% were students. This can be attributed to early sexual debut, multiple sexual partners, increased risk of STIs and its attendant risk of PID, and unwanted pregnancy which usually end up with unsafe abortions. These patients are also unlikely to seek proper medical attention with the resultant effect of poor treatment resulting in tubal damage [6,15]. Majority (66.8%) of the patients attained secondary school level of education and 12.8% had only primary education. Similar report was observed at Nnewi [8], where majority (55.6%) of the patients attained secondary school level of education while only 11.1% had tertiary education. Because of the low socio-economic condition of majority of these patients, as is the case in most developing countries, they are more prone to unsafe abortion. In addition, they are highly sexually active and at high risk of contracting STIs, and are more likely to resort to self-medication [6,15,22].

Patients of low parity (0-2) were 222 (88.8%) in this study, with nulliparous women making up the majority (52.4%). Studies in Nigeria show that ectopic pregnancy is a disease of the lower parities [10-14]. Comparable finding was reported in Kebbi [18], where 76.9% of the patients were nulliparous. The studies in Nnewi [8], and Sokoto [1], recorded that 72.3% and 64% of the women respectively, were between Para 0 and 2. The low parity and single women may be predisposed to multiple sexual partners, STIs, low contraceptive use [25] and abortions which precede the ectopic pregnancy in a cause-effect relationship [8].

The predominant risk factors of previous induced abortions (76.8%) and PID (63.2%) are suggestive of tubal damage as a common pathway which was consistent with the findings in Benin City [16], Uyo [15], Lagos [6], and Kano [21] all in Nigeria. The use of intrauterine contraceptive device (IUCD) and progesterone-only contraceptive in this study were 1.6% and 4% respectively. IUCD prevents intrauterine pregnancy more effectively than ectopic pregnancy causing an apparent but real increase in the risk of ectopic pregnancy when a user becomes pregnant.

About 10% of cases in this study had a previous abdominal/pelvic surgery. This finding is similar to 9.2% in Nnewi [8]. Peritoneal adhesion formation is a common consequence of any abdominal operation or intra-abdominal inflammatory process. This can cause a distortion of the fallopian tubes predisposing to ectopic pregnancy [17]. In this study, 9 (3.6%) patients had a previous history of ectopic pregnancy. This corresponds with the 4.95% reported in Kano [21], but more than 1.4% in Uyo [15]. Previous history of ectopic pregnancy increases the risk of another ectopic pregnancy by about 12-18% [5]. There were no identifiable aetiological factors in 33 (13.2%) cases of this study.

Majority (91.6%) of the patients in this study had ruptured ectopic pregnancy. This is due to late presentation. It is similar to the findings in Makurdi (94.6%), Benin City (80.3%) [16] and Ghana (94.6%). This is the case in most developing countries where 80-95% of cases of ectopic pregnancies are ruptured at presentation [6-12,16-19]. It is contrary to the situation in the developed countries of the world where the detection rates for unruptured ectopic pregnancy ranges from 88% to 100% [4,9,18]. It is a reflection of the improved enlightenment and awareness on the part of the patients, coupled with the use of modern diagnostic techniques like the combination of serum B-hCG, transvaginal sonography and laparoscopy in detecting the condition early [17,24].

The commonest symptoms at presentation in this study were lower abdominal pain, amenorrhoea, vaginal bleeding and fainting attack. This followed the similar trend in some studies [24]. The clinical signs common in the patients were abdominal tenderness, pallor, positive cervical excitation tenderness, fullness of the pouch of Douglas and a palpable adnexal mass. Seventy two (28.8%) patients were in hypovolaemic shock at the time of presentation. These findings are similar to those observed in Kano [21], Lagos [6] and Nnewi [8]. There are no specific signs and symptoms that are pathognomonic. Therefore, a high index of suspicion is necessary for appropriate diagnosis.

The commonest site of ectopic pregnancy as observed in this study is the fallopian tube in 239 (95.6%) cases. This agrees with report from some Nigerian studies [8,21]. A study in France reported 95.5% tubal ectopic pregnancies [3]. Of the 95.6% tubal ectopic pregnancies in this study, the commonest site involved was the ampulla (64.4%). This is consistent with most Nigerian studies [8,23]. In a similar French study, the ampulla was reported as the commonest site with 70% of cases; followed by isthmus (12%) and fimbrial (11.1%) [3].

The right fallopian tube was involved in 62.1% of all the tubal ectopic pregnancies in this study, while the left tube was affected in 33.5% of cases. Similarly, the right and left fallopian tubes were respectively affected in 54.6% and 34.9% in Benin City [16] and 69.4% and 30.6% in Nnewi [8]. This right sided preponderance has been attributed to appendicitis [20].

Abdominal and ovarian ectopic pregnancies were observed in 2 (0.8%) and 9 (3.6%) cases respectively. No other extra-tubal pregnancy was recorded. One of the abdominal ectopic pregnancy was seen at term with the delivery of a live baby following laparotomy. Non-tubal ectopic pregnancies are a rare occurrence, accounting for 1-3% of ectopic pregnancies [5].

All the patients in this study were managed surgically with open laparotomy, because majority (91.6%) presented late with the ruptured variety and were haemodynamically unstable. Majority (87.2%) of the patients had salpingectomy of the affected tube. Others were cornual resection in 14 (5.6%) cases, unilateral salpingo-oophorectomy in 7 (2.8%) cases and unilateral oophorectomy in 9 (3.6%) cases. Similar findings were reported in most studies in Nigerian and other developing countries of the world where open laparotomy with salpingectomy of the ruptured tube were performed in 85-100% of cases [7,8,16-18,21].

No case fatality was recorded in this study. This is similar to studies in Makurdi [2], Nnewi [8] and Indian [3]. However, mortalities were recorded in studies in Uyo (1.4%) [15], Sokoto (1.5%) [1] and Ghana (2.79%). All these may be a reflection of how late the patients presented, the clinical state on presentation and the promptness of resuscitation and surgical intervention.

V. Conclusion

The prevalence and complications of ectopic pregnancy remains high in our environment. It is a common cause of maternal morbidity in the first trimester of pregnancy and a significant cause of reproductive failure in our environment. Increase in the utilization of effective contraceptive and early detection and intervention are necessary in reducing the associated morbidity and mortality.

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