Original Article

An Appraisal of the Management of Ectopic Pregnancy in a Nigerian Tertiary Hospital

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Abstract

Background: Ectopic pregnancy has remained a significant cause of maternal morbidity and mortality especially in the sub Saharan Africa. A periodic appraisal of its management is paramount. **Aim:** To determine the incidence and associated risk factors, for ectopic pregnancy, review available treatment modalities and suggest interventions to reduce its prevalence, morbidity and mortality. **Materials and Methods:** A cross sectional study with retrolective data collection of all cases of ectopic pregnancy managed in Nnamdi Azikiwe University Teaching Hospital, Nnewi, south-east Nigeria between 1st January, 2002 and 31st December, 2011 was undertaken. Analysis was carried out using Epi-info 2008 version 3.5.1. **Results:** During the study period, there were a total 98 cases of ectopic pregnancies out of 8,811 deliveries and 1884 gynecological admissions, giving an incidence of 0.9% of all attendants or 1 in 90 deliveries and 5.2% of all gynecological admissions. Only 94.9% (93/98) case files were retrieved and were used in the final analysis. The mean age of the patients was 30.1 (0.7) years while the mean gestational age at presentations was 7.4 weeks. Previous induced abortion, 37.5% (36/93) was the commonest associated risk factor, followed by pelvic infections, 35.5% (33/93). The recurrence rate was 6.5% (6/93). Majority, 80.6% (75/93) presented with abdominal pain and 35.8% (33/93) presented with vaginal bleeding. Up to 88.2% (82/93) had salpingectomy while only 2.5% (2/93) were successfully managed medically with methotrexate therapy following diagnosis with transvaginal ultrasound Missed diagnosis of ectopic pregnancy occurred in 16.1% (15/93). There was no maternal death. **Conclusion:** Ectopic pregnancy has remained an important gynecological condition in our center. The common identifiable risk factors were induced abortion and pelvic infection. Early first trimester transvaginal ultrasound should be offered to all women for early diagnosis.

Keywords: Appraisal, Ectopic pregnancy, Management

Introduction

Ectopic pregnancy is a significant cause of maternal morbidity and mortality especially in the sub Saharan Africa. While mortality from ectopic pregnancy has been on the decrease in the developed countries despite the increase in the incidence, it is not so in the developing countries, where it is major cause of maternal mortality.[1-5] Case fatalities of 27.9 per 1000[6] and 37 per 1000[7] had been reported in Accra, Ghana and Lagos, Nigeria respectively.

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More than 95% of ectopic pregnancies occur in the fallopian tube. The other sites include ovaries, cervix, caesarean scar, broad ligament and abdominal cavity.[8] Combined intra-uterine and extra-uterine pregnancy (heterotopic pregnancy) though rare in spontaneous pregnancies (1 in 3000-4000), has been recorded in up to 3% of pregnancies from assisted reproduction.[8]

Several factors have been shown to increase the risk of ectopic pregnancy. These risk factors share a common mechanism of action – namely interference with the ciliary functions of fallopian tube.[9,10] It has been observed that pelvic inflammatory disease is the most common risk factor for ectopic pregnancy

and early treatment of the disease does not necessarily prevent tubal damage.[9] The other reported aetiological factors include previous ectopic pregnancy, endometriosis, previous tubal surgery, infertility and infertility treatments.[3] Previous caesarean sections, tubal spasm, congenital defects of the fallopian and psychological and emotional factors have also been implicated.[3,11]

In the majority of cases, surgery is the mode of treatment. The surgical treatment may either be an open laparotomy or laparoscopic depending on the surgeon′s skill, availability of equipment and clinical state of the patient.[1] The management of ectopic pregnancy has been revolutionized over the past few decades. This has resulted in emergence of several non-surgical options to what had once thought to be a solely surgically treatable condition. An earlier diagnosis can be made with transvaginal ultrasound and quantitative serum β hCG. This increases the chances of success of medical treatment and minimizes its morbidity, mortality and financial burden.[11,12]

There have been some palpable changes in the diagnosis and treatment of ectopic pregnancy over the past decade at the study center. This study therefore determines the incidence, associated risk factors, the currently available treatment modalities and suggests means of reducing the incidence and morbidity/mortality associated with ectopic pregnancy.

Materials and Methods

This was a cross sectional study with retrolective data collection of all the cases of ectopic pregnancy managed at the Nnamdi Azikiwe University Teaching Hospital, Nnewi, south-east Nigeria between 1st January, 2002 and 31st December, 2011 (over a ten year period). All the cases of ectopic pregnancy were identified from the records in the gynecology ward, operating room and accident and emergency unit. Their case files were retrieved from the Medical Record department of the hospital. The information on the age, parity, marital status, highest level of education and gestational age at presentation were extracted from the case files. The other information extracted included the risk factors, clinical presentations, treatment modalities (whether surgical or medical), intra-operative findings and outcomes of ectopic pregnancy. The inclusion criteria for medical management of ectopic pregnancy was haemodynamic stability, gestational size less than 4 cm by transvaginal ultrasound, serum beta hCG level less than 10,000 μ/ml, absence of free fluid in the pelvic cavity and the desire of the patients for future fertility.[10] Permission to conduct this study was sought from and granted by the study hospital's Ethical Committee. The data obtained were put in percentages, mean, and standard deviation. Data analysis was done using Epi Info 2008 (v 3.5.1; Epi Info, Centers for Disease Control and Prevention, Atlanta, GA).

Results

Over the 10-year review, there were a total 98 cases of ectopic pregnancies out of 8,811 deliveries and 1884 gynecological admissions, giving an incidence of 1.1% or 1 in 90 deliveries or 11.1 per 1,000 deliveries and 5.2% of all gynecological admissions.

Their ages ranged from 24 to 43 years with mean age of 30.1 (0.7) years. The peak age was 26-30 years. Seventy eight of the 93 patients (83.9%) were less than 35 years old. All the patients were Nigerians from Igbo tribe.

The parity ranged between 0 and 8. The multiparous patients were the largest 51 (54.8%). The mean gestational age at presentations was 7.4 weeks with a range of 5-2 weeks. Sixty two point four percent (58/93) of the patients were married while 37.6% (36/93) were single. Majority, 76.3% (71/93) had secondary level of education, 22.6% (21/93) tertiary, while 8.6% (8/93) were primary and none of the patients had no formal education.

Table 1 shows the associated risk factors. Previous induced abortion 37.5% (36/93) was the commonest, followed by pelvic infections 35.5% (33/93). Up to 32.3% (32/93) of patients had no identifiable associated risk factor. Six of the 93 patients had previous ectopic pregnancy hence the recurrence rate was 6.5%.

The presenting symptoms are shown in Table 2. Up to 80.6% (75/93) of patients presented with abdominal pain while 35.8% (33/93) presented with bleeding per vaginam. Abdominal paracentesis which yielded non-clotting blood was recorded in 54.8% (51/93) of cases.

Ectopic pregnancies were ruptured in 80.6% (75/93) of cases seen at presentation. Up to 88.2% (82/93) were tubal pregnancies, 6.4% (6/93) ovarian and 3.2% (3/93) abdominal pregnancies.

Table 3 shows the types of treatment. Majority, 88.2% (82/93) had total or partial salpingectomy. However, 2.2% (2/93) of

Table 1: The risk factors associated with ectopic pregnancy (n*=93)**

Risk factors	Frequency	Percentage
Previous induced abortion	36	38.5
Pelvic infections	33	35.5
Previous abdominopelvic surgery	27	29.0
Appendicectomy	15	16.1
Caesarean section	6	6.5
Tuboplasty	3	3.2
Myomectomy	3	3.2
Age≥35 years	15	16.1
Infertility	9	9.7
Multiple sexual partners	9	9.7
Previous ectopic pregnancy	6	6.5
Unidentified	30	32.3

*Some women had more than one risk factor

cases were successfully managed medically with methotrexate therapy following early diagnosis at a gestational age of five and six weeks respectively with transvaginal ultrasound and beta human chorionic gonadotrophin (hCG) assay. The successful treatment was defined as decrease of beta hCG level more than 15% between days 4 and 7 of methotrexate injection without any need for further intervention.[10] There were one live birth and two still births following abdominal pregnancy.

Intraoperatively, out of the 82 of the tubal ectopic pregnancies, 63.4% (52/82) occurred in the ampulla, 25.6% (21/82) in the isthmus while 11.0% (9/82) in the cornua. Up to 56.1% (46/82) of the tubal ectopic pregnancies occurred in the right fallopian tube and, 43.9% (36/82) occurred in the left, while 3.7% (3/82) were bilateral.

The diagnosis of ectopic pregnancy was missed in 16.1% (15/93) of patients. The correct diagnosis was however made at laparotomy. There was no maternal death.

Discussion

This study reaffirmed that ectopic pregnancy is a significant gynecological emergency in our centre. The incidence of 1.1% in this study is higher than the reports from developed countries like Sweden and Finland.[13-15] However, the incidence of 11.0 per 1000 pregnancies in U.K in 2000-2002[15] is similar with our study. The incidence in this study is however, higher than those from various studies within Nigeria.[17-20] The increased incidence in our center may be due to its tertiary status, being a referral center for complicated gynecological cases from the peripheral clinics and hospitals. Also, the high index of suspicion and better diagnostic facilities, such as the transvaginal ultrasonography and laparoscopy may be contributory.[1]

Table 2: The symptoms in patients with ectopic pregnancy (*n=93)

Symptoms	Frequency	Percentage
Abdominal pain	75	80.6
Bleeding per vaginam	33	35.8
Fainting attacks/dizziness	27	29.0
Nausea/vomiting	24	25.8
Abdominal swelling	12	12.9
Shock	6	6.5
Fever	6	6.5

*Most women presented with more than one symptom

Table 3: Treatment modalities of ectopic pregnancy

Treatment	Number (n=93)	Percentage
*Total salpingectomy	70	75.3
Partial salpingectomy	12	12.9
Ovarian excision	3	3.2
Ovariectomy	3	3.2
Laparotomy with delivery of live fetus	1	1.0
Laparotomy with delivery of term still birth	2	2.2
Methotrexate treatment	2	2.2
Total	93	100.0

*Three patients (bilateral ectopic pregnancies) who had unilateral salpingectomy also had unilateral salpingotomy in their contralateral tube

The highest incidence of ectopic pregnancy was recorded among the age group 26-30 years in this study. The mean age of 31.1 (0.7) years is similar to the report from Kaduna.[17] The possible reason for this finding is that in recent years, the age at first conception has increased, which ultimately contribute to the increased incidence rate.[2]

The commonest associated aetiological factor associated with ectopic pregnancy in our study was previous induced abortion followed by pelvic infections. This finding is similar to reports from Enugu,[19] Ilorin,[20] Benin,[21] and Niger Delta,[22] all in Nigeria. This could be the result of tubal damage following pelvic infections and unsafe abortions.[23] The scarring following tubal damage could obstruct the embryo transport[1] with the consequent tubal implantation.

About one third (32.3%) of patients in this study did not have any identifiable associated risk factor. It is evident that there may not be any tubal damage in many cases of ectopic pregnancy.[3] In these women the cause of ectopic pregnancy may be a dysfunction in the tubal smooth muscle activity.[4] Embryonic abnormalities have also been implicated in the attempt to explain the occurrence of ectopic pregnancy in the absence of tubal pathology.[4]

Ectopic pregnancy could present with diverse symptoms as shown in this study. Abdominal pain and vaginal bleeding were the most common presenting symptoms and these are similar to the findings of others within the sub region.[18,22,23] The abdominal pain which is due to peritoneal irritation is not unusual since most of the patients presented with ruptured ectopic pregnancy, unlike in the developed countries where the un-ruptured cases are more common.[24-26] Abdominal pain however, is usually a late feature in the clinical presentation of ectopic pregnancy.[3,4] The pain could be caused by tubal miscarriage and bleeding through the fimbrial end of tube into the peritoneal cavity.[4] The pain could vary in intensity and usually does not necessarily reflect the volume of blood lost inside the abdominal cavity.[4]

Vaginal bleeding was observed in 35.8% of patients with ectopic pregnancy which is similar to other studies in Nigeria.[18,22] However, some studies have shown that about 10-20% of ectopic pregnancies may present without vaginal bleeding.[27] There are no specific symptoms or signs that are pathognomonic for ectopic pregnancy and many disorders such as ruptured chocolate cyst and twisted ovarian tumor may mimic its presentation.[28] In a report in UK, missed diagnosis was made in more than a third of women who hitherto died

from ectopic pregnancy.[13] Similarly, more than 10% of patients in Ile Ife Nigeria were also reported to have died from ectopic pregnancy due to missed diagnosis.[27] The absence of vaginal bleeding contributes to late presentation and the consequent rupture of the ectopic gestation.

In this study, laparotomy was the only surgical intervention method at our disposal for the management of ruptured ectopic pregnancy as majority had massive haemoperitoneum though some still had clinical stable state. Similarly, laparoscopy has been shown to be very useful in both diagnosis and management of ectopic pregnancy.[4,28,29] It is employed only when the patient is haemodynamically stable. It has the advantage of confirming the diagnosis and the removal of the ectopic mass using operative procedures at the same time. It can also be used for direct injection of chemotherapeutic agents into the ectopic mass when medical management was decided.[30] Where sensitive transvaginal ultrasound or laparoscopy is not readily available, culdocentesis is still a diagnostic alternative.[28,30] The procedure is simple and safe. Unfortunately, negative culdocentesis does not rule out an ectopic pregnancy neither is a positive result very specific.[30] Aspiration of non-clotting blood with haematocrit > 15% signifies ruptured ectopic pregnancy.[30]

Nevertheless, this study was interesting due to the result of successful medical management of two cases that had un-ruptured tubal ectopic pregnancy and met the appropriate inclusion criteria. They were successfully managed with methotrexate therapy following diagnosis using transvaginal ultrasound scan.

Transvaginal ultrasound scan provides much clearer images of pelvic structures in comparison to trans-abdominal.[4,5] By using the transvaginal approach it is possible to palpate pelvic organs under visual control, which enables assessment of their mobility and helps to establish the source of pelvic pain. Gentle pressure applied with the tip of the probe may be used to demonstrate the mobility of the suspected tubal ectopic from the ovary. This 'sliding organs sign' is used to reduce false positive diagnosis of ectopic pregnancy in women with a prominent corpus luteum on ultrasound scan.[4] However, in experienced hands, transvaginal ultrasound will detect 75-80% of clinically significant tubal ectopic at the initial examination.[4] The remaining 20-25% can be detected on follow-up visits and ultrasound should rarely fail to visualize an ectopic pregnancy pre-operatively.[4] The successful treatment was defined as decrease of beta hCG level more than 15% between days 4 and 7 of methotrexate injection, and this will require no further intervention.[10]

The tubes remained the commonest site of ectopic pregnancy in our review with the ampulla being the segment commonly affected. This is similar to the findings of other studies in Benin, Nigeria.[21] Interestingly this study revealed six cases of ovarian pregnancies per 8,811 deliveries. This finding is higher than the incidence of 1 per 40,000 reported by Onwuhafua, *et al*., in Kaduna.[17] The Spiegelberg's criteria for diagnosis of ovarian pregnancy may not have been strictly adhered to in this review though all the patients had histopathologic diagnosis of ovarian pregnancy.[30]

Salpingectomy remained the commonest surgical procedure for the management of ectopic pregnancy in our center which is similar to other centers in Nigeria.[19,20] Ipsilateral oophorectomy was only performed when the ovaries was diseased or involved in the adnexal mass.[30,31] Conservative surgery is reserved for those with less tubal damage and contralateral tubal diseases, especially if they are nulliparous.[30] However, patients who had bilateral ectopic pregnancy had unilateral salpingotomy and unilateral total salpingectomy. Such patients could have tubal surgery later in life if they still wish to maintain their fertility desires.[30,31] A similar finding was reported by Eze *et al*., in Abakaliki, Nigeria.[31]

The maternal mortality rate as published by numerous hospital based studies in Africa lie between 1% and 3% of all cases of ectopic pregnancy.[7,23,32] This figure may even represent an underestimation because in developing countries maternal deaths are frequently under reported, especially patients that died before arrival at the hospital.[7,33] Interestingly there was no recorded case fatality in our study.

The study was cross sectional with a retrolective data collection and the records and units have not been computerized. Also, this study could not evaluate the fertility outcomes of these patients that had ectopic pregnancy. Thus, further prospective longitudinal study is strongly advocated to identify the trend and fertility outcome of ectopic pregnancy.

In conclusion, ectopic pregnancy has remained an important gynecological condition in our center. The most common identifiable risk factor was induced abortion. Prevention should be aimed at health education and liberal use of contraceptives. Efforts should also be directed at prevention and adequate treatment of pelvic inflammatory diseases and sexually transmitted infections (STIs). Early transvaginal ultrasound should be offered to all women at the early trimester for early diagnosis and possible medical treatment.

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