

# Ectopic Pregnancy: A Review of Clinical Presentation and Management in Niger Delta University Teaching Hospital, Bayelsa State Nigeria

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## ABSTRACT

**Background:** Ectopic pregnancy poses a major health and reproductive challenge to childbearing women. It is a significant hemorrhagic disorder that continues to contribute substantially to maternal morbidity and mortality. This is an error of zygote implantation outside the endometrial cavity with consequent rupture and or death of the fetus because of the failure of implantation site to sustain further fetal growth and development. Unless timely interventions, the consequences of ruptured ectopic pregnancy can be life-threatening.

**Objectives:** To measure the incidence of ectopic pregnancy in the Niger Delta University Teaching Hospital, determine its contribution to early pregnancy loss, case-fatality rate and investigate the possible associated risk factors and other relevant correlates.

**Methods:** Data on each ectopic pregnancy that presented from 2015 to 2020 were collected and analyzed.

**Results:** Ectopic pregnancy constituted 6.3% and 23.9% of gynaecological admissions and surgeries respectively and an incidence of 2.8% of live births and 2.3% of all pregnancies managed. Median age of patients was 29 (interquartile 25-34) years, the leading identifiable risk factors were previous induced abortion (72.7%), intra-abdominal surgery (23.6%) and multiple sex partners (21.5%). The commonest clinical presentation was abdominal pain (96.4%), dizziness/fainting spell (58.2%) and vaginal bleeding (41.8%). Mean estimated blood loss was 1593.6±702.8mls, 85.5% of the patients were anemic at presentation and 89.1% received blood transfusion. Tubal pregnancy was 94.5%, left tube 51.9%, ampullary 69.2% and isthmic 17.3%. All the patients had laparotomy, 92.7% salpingectomy (49.1% left and 43.6% right). There was one death; a case fatality of 1.56%.

**Conclusion:** Ectopic pregnancy still remains a major cause of maternal morbidity and mortality. Prior tubal damage, mostly from pelvic infection is the risk factor. Quality contraception, blood banking services and legalization of abortion will mitigate the impact of ectopic pregnancy

**Keywords:** ectopic, pregnancy, incidence, salpingectomy, case-fatality, risk factor

## INTRODUCTION

Ectopic pregnancy (EP) is an extrauterine pregnancy and can result in massive hemorrhage, infertility or mortality. It occurs when the product of conception implants in any other site other than uterine endometrial cavity.<sup>[1]</sup> Overall, it complicates about 1.1- 2% of all pregnancies.<sup>[2-3]</sup> In Nigeria, reported incidence is 1.5%-3.3%<sup>[4-6]</sup> and 1.6%-

2.2% of live births in developed societies.<sup>[7]</sup>

For the women who survive EP, there is increased risk of the compromise of their future fertility.

Without timely diagnosis and treatment, EP can be life threatening from massive hemorrhage. It is the leading cause of maternal death in the first trimester of pregnancy.<sup>[2]</sup> On diagnosis it can be amenable to expectant, medical or surgical

treatment depending on the timing of presentation.<sup>[1]</sup> With the recent advances in early diagnostic techniques; with high resolution transvaginal ultrasonography, endoscopy, rapid and accurate serum human chorionic gonadotropin (hCG) detection, conservative surgical and non-surgical treatment of unruptured ectopic pregnancy is possible.<sup>[5]</sup> In addition to these, are the recent increased awareness of risk factors for EP and the establishment of early pregnancy assessment units<sup>[3]</sup> This has improved the management outcome from the previous late emergency life threatening event treated with radical ablative surgery to more benign early haemodynamically stable cases amenable to conservative treatment.<sup>[3]</sup>

The etiology of EP is shrouded in controversies. Implicated in its etiology is previous baseline tubal damage from any cause. Pelvic inflammatory disease (PID) with Neisseria gonorrhoea and chlamydia trachomatis is associated with increased tubal damage in 13%, 35% and 75% in successive one, two or three episodes respectively.<sup>[2]</sup> Similarly, septic abortion and puerperal sepsis are implicated in tubal damage. Endosalpinx inflammation from infection or smoking impairs tubal smooth muscle contractility and mucociliary activities thereby disrupting tubal embryo transport.<sup>[1]</sup> The improved diagnostic techniques, anesthesia, antibiotic therapy and blood transfusion services have improved the outcome of management of ectopic pregnancy. The incidence of EP is highest among women aged 35-44 years due to progressive loss of myo-electrical activity responsible for tubal motility along the fallopian tube with aging.<sup>[2,8]</sup> There has been a substantial rise in the incidence of EP in the recent years, however, its associated mortality remains relatively static.<sup>[8]</sup>

This study was designed to investigate ectopic pregnancies managed at Niger Delta University Teaching Hospital (NDUTH) to recommend measures to ameliorate its impact.

## MATERIALS AND METHODS

A case series descriptive study was done on the cases of ectopic pregnancy managed from January 2015 to December 2020 at Niger Delta University Teaching Hospital in Bayelsa State, Niger Delta region of Nigeria. This region is oil and gas rich region of Nigeria. The residents of this state are majorly the indigenous Izon ethnicity, Nembe, Ogbia and people from other regions within and outside Nigeria. Farming, Fishing and trading are the leading native occupations. Niger Delta University Teaching Hospital (NDUTH) Okolobiri is the referral center to other facilities within the domicile state and the immediate neighboring states of Delta and Rivers. Her department of Obstetrics and Gynecology is run by consultant obstetricians and gynecologists supported by other personnel. It undertakes the training of undergraduate medical students and postgraduate obstetrics and gynecology trainees in addition to research and clinical services

Data on independent variables were age, parity, marital status, education, occupation of spouse, previous history of ectopic pregnancy, abortions (spontaneous and induced), experience with contraception, pelvic infection (PID/septic abortion/puerperal sepsis). Others include total live births within the period, maternal deaths, total gynaecological admission and surgery, early pregnancy losses (number of abortions, gestational trophoblastic diseases (GTD) and EP). The social classification of the women was based on the educational attainment of the women and the occupation of their husbands.<sup>[9]</sup> The husband's occupation was classified into professional, middle level and unskilled respectively scored 1, 2 and 3 while the education of the women was scored 0, 1 and 2 respectively for tertiary, secondary and primary levels of education. The aggregate of the two scores was the social class. For the purpose of this study the social class I and II was high class, class III middle class while IV and V formed the lower class. The dependent variables were number of ectopic

pregnancies, risk factors and maternal death thereof. Data was managed with EPI INFO version 3.5.1 and Graphpad Instat computer software. Simple descriptive statistics using frequency and percentage as appropriate were done. The Student's t-test went for the parametric variables with statistical significance set at  $p < 0.05$ . Comparative statistics to test for association was done using the Fishers exact with statistical significance set at  $P < 0.05$ .

## RESULTS

Data and analysis were on 55 of a total of 64 ectopic pregnancies managed at the center in the study period a retrieval rate of 85.9%. EP constituted 64/268(23.9%) of gynaecological surgeries, 64/2322(2.8%) of live births, 64/2768(2.3%) all pregnancies managed at the center, 64/1018 (6.3%) gynaecological admissions and 64/374 (17.1%) first trimester early pregnancy loss. One of the patients died, a case fatality rate of 1.56%.

**Table 1: Demographic Profile of Patients**

Characteristic	Variable	Frequency	%
Age(years)	<20	1	1.8
	20-24	7	12.7
	25-29	20	36.4
	30-34	17	30.9
	≥35	10	18.2
Marital status	Married	32	58.2
	Unmarried	23	41.8
Gravidity	1	4	7.3
	2-3	12	21.8
	≥4	39	70.9
Parity	0	13	23.6
	1	8	14.5
	2	11	20.0
	3	8	14.5
	4	8	14.5
	≥5	7	12.8
Education	≤2 <sup>0</sup>	37	67.3
	>2 <sup>0</sup>	18	32.7
Social class	Upper	7	12.7
	Middle	24	43.6
	Lower	24	43.6

Table 1 shows the demographic features of the patients. The median (interquartile) age of patients was 29(25-34) years, mean age 29.5±5.4 years. The modal (36.4%) age group was 25-29 years. The majority (81.8%) of the patients were younger than 35years and the rest 18.2% were aged 35 and older. Similarly, about

three (58.2%) of every five patients were married and 41.8% were single. About four of every five (76.4%) patients have had at the least one previous delivery while the rest 23.6% were nulliparous. The majority (67.3%) had secondary level of education or less. Most (87.2%) of them were from middle 43.6%) or lower (43.6%) socioeconomic class.

**Table 2: Identifiable Risk Factors**

Risk factor	Frequency	%
Induced abortion	40	72.7
*Previous Intra-abdominal Surgery	13	23.6
‡Progestogen-only contraception	6	10.9
Subfertility	1	1.8
Previous treatment for PID/pelvic infection	6	10.9
Previous ectopic pregnancy	1	1.8
Multiple sex partners	12	21.5
Smoking	3	5.5
Polygamous setting	4	7.2
Evidence of pelvic adhesion at surgery	10	18.2
None	6	10.9

\*Previous intra-abdominal surgeries: Appendectomy (6), C-section (4), Laparotomy + salpingectomy (1), myomectomy (1) and ovarian cystectomy (1).

‡ Implant (2), Depo-Provera (3), levonorgestrel (postinor) (2)

Table 2 shows the identifiable risk factors for ectopic pregnancy among the patients. Previous induced abortion (72.7%), mean ± SD 2.6±2.2, range=1-8. intra-abdominal surgery (23.6%) and multiple sex partners (21.5%) were the leading identifiable risk factors among the patients. No identifiable risk factors in 10.9% of the patients. Some of the patients had multiple risk factors.

Table 3 shows the clinical presentation of the patients. The mean estimated gestational age (EGA) at presentation was 8.4±2.8 weeks and a range of 4.4-21 weeks while the median (interquartile range) was 8.0(6.5-9.4) weeks. Mean EGA at presentation by site of implantation; tubal 8.1±2.0 weeks, abdominal was 18.0±4.2 weeks, median IQR 18.0 (15-21) and ovarian was 6.0 weeks. Mean EGA at presentation by portion of the tube; ampulla 8.5±1.6, median 8.4(7.1-9.4) weeks, fimbria 7.5±2.3, median 7.8(5.9-9.1) weeks, interstitial 10.0±3.8, median 10.5(6.0-13.6) weeks and isthmic 6.0±1.4, median 6.0(5.3-6.1) weeks. The patients presented mostly with

abdominal pain (96.4%), dizziness/fainting spell (58.2%), vaginal bleeding (41.8%) and vomiting (27.3%). Forty two (76.4%) complained of 2<sup>o</sup> amenorrhea.

**Table 3: Clinical Presentation of Patients**

Characteristic	Variable	Number	Percentage
Clinical presentation	Abdominal pain	53	96.4
	Per vaginal bleeding	23	41.8
	Collapse	3	5.5
	Dizziness/Fainting spells	32	58.2
	Vomiting	15	27.3
	Hypovolemic Shock/unconscious	4	7.3
	Fever	3	5.5
	Diarrhea	3	5.5
	Secondary Amenorrhea	42	76.4
	Shoulder tip pain	10	18.2
Mean Estimated gestational age(EGA) at presentation (weeks)	8.4±2.8	-	-
Mean EGA at presentation by site (weeks)	Abdominal	18.0±4.2	-
	Ovarian	6.0	-
	Tubal	8.1±2.0	-
Mean EGA at presentation by portion of tube(weeks)	Ampulla n=36	8.5±1.6	-
	Fimbrial n=4	7.5±2.3	-
	Interstitial n=3	10.0±3.8	-
	Isthmic n=9	6.0±1.4	-

**Table 4: Complications**

Variable	Number	Percentage
Hematocrit<30% at presentation	47	85.5
Transfused blood	49	89.1
Surgery	55	100.0
Wound sepsis	1	1.8
•Mean Estimated blood loss EBL(mls)	1593.6±702.8	
Long hospital stay ≥8	14	25.5

•Hemoperitoneum and Primary surgical blood loss (total blood loss)

Most (85.5%) of the patients presented with anemia (hematocrit <30%). The patients transfused with blood (89.1%) received blood either only intraoperative (30.6%), preoperative and intraoperative 4(8.2%), intra-operative and postoperative (51.0%) or only postoperative (10.2%). The mean estimated blood loss was

1593.6±702.8mls and a range of 250-3200mls. Mean blood loss by site of implantation; abdominal 2050±919.2mls, ovary 800.0mls and tubes 1591.3±697.0mls. There was no significant difference in blood loss between the abdominal and tubal pregnancies (2050±919.2 vs.1591, 3±697, p=0.37) Estimated blood loss by the portion of the tube; the ampulla 1491.7±677.4mls, Fimbrial 1100.0±385.1mls, interstitial 2633.3±602.8mls and isthmic 1861.1±537.2mls. One-way analysis of variance (ANOVA) p<0.01. There was significant difference in blood loss across the portions of the tube.

**Table 5: Pathological Findings at Surgery**

Pathology	Variable	Frequency	%
State of Contralateral tube	Hydrosalpinx/pyosalpinx	2	3.6
	Beaded	1	1.8
	Bound down /buried in pelvic adhesions	9	16.4
	Grossly normal	43	78.2
Corpus lutein cyst	Ipsilateral	7	12.7
	Contralateral	1	1.8
Implantation site	Tube	52	94.5
	Ovary	1	1.8
	Abdomen	2	3.6
State of EP	Slow leaking	6	10.9
	Complete rupture	49	89.1
Side of Tube	Left	27	51.9
	Right	25	48.1
Portion of Tube	Isthmic	9	17.3
	Fimbria	4	7.7
	Ampulla	36	69.2
	Interstitial	3	5.8

Table 5 shows the pathological findings at surgery. While the majority 43 (78.2%) of the contralateral tubes appeared grossly healthy at surgery, the rest were either bound down in pelvic adhesions (16.4%) or hydrosalpinges (3.6%). Tubal

pregnancy contributed the majority (94.5%) with the left tube more involved 51.9% vs. 48.1%. Among the tubal pregnancies, the ampullary portion (69.2%) was the most affected followed by the isthmic portion (17.3%).

**Table 6: Site of Ectopic and Surgery done at Laparotomy**

Implantation Site	Surgery Done	Frequency	Percent
Right interstitial	Right Conual Resection/Metroplasty	1	1.8
Abdominal	Excision Abdominal POC	2	3.6
Ovary	Excision Ovarian POC	1	1.8
Left fallopian tube	Left Salpingectomy	27	49.1
Right fallopian tube	Right Salpingectomy	24	43.6
Total		55	100.0

POC= Product of conception

All the cases had rupture, hemoperitoneum and emergency laparotomy. The majority (92.7%) had

salpingectomy, 49.1% and 43.6% left and right respectively Table 6.

**Table 7 Intervention before and at Presentation**

Timing	Intervention	Frequency	Percent
Before Presentation	•Attempted Termination of pregnancy	8	14.5
	Abdominal massage	22	40.0
	Emergency contraception	2	3.6
	Pregnancy test	13	23.6
	Abdominal Ultrasound	14	25.5
At presentation	Laparotomy	55	100.0
	Repeated laparotomy	2	3.6
	Blood transfusion	49	89.1
	Antibiotics	55	100.0
Outcome	Subsequent /delivery	3	5.5

\*Dilatation & curettage=3, MVA =2, Oral/vaginal misoprostol=2, Injectable oxytocic=1

Table 7 shows the interventions patients had before and at their presentation at the study center. Two of every five (40.0%) of them went for abdominal massage, about a quarter had abdominal ultrasound scan(25.5%) and pregnancy test(23.6%) respectively while 14.5% had various failed attempts to terminate their pregnancy. All the patients had laparotomy and received antibiotics while most (89.1%) of them received blood transfusion.

## DISCUSSION

This study sought to measure the incidence of ectopic pregnancy, its contribution to early pregnancy wastage, case fatality and to assess the contributing factors to its occurrence. The median age of the patients was 29 years and mean 29.5 years similar to a previous report from this center. [10] and one other report from southwest Nigeria. [11] The peak age

incidence was 25-29 years (36.4%) consistent with other reports. [6, 10] This is the age group at the prime of their reproductive career and most of them were nulliparous or low parity and single therefore were at the increased risk of future reproductive failure. The majority 58.2% of patients were married similar to a previous report from this center [10] and other local workers [6,12] unlike reports of higher proportion of the unmarried women from other workers. [13-14] Nulliparous patients were 23.6% comparable with a report from northern Nigeria [6] and 41.8% were single. The preponderance of EP among the married patients in this data is attributable to increased multiple sex partners, polygamous marriage and poor contraceptive practice among them. Only 14.5% of the patients were practicing contraception while 85.5% were not practicing any form of contraception in consistent with other local

reports.<sup>[5-6]</sup> Consequently there was increased clandestine induced and unsafe abortion for unplanned and undesired pregnancies commonplace in the study setting with restrictive abortion laws. Induced abortion tend to be unsafe and associated with increased postabortal sepsis as much as 71.2% in a report.<sup>[15]</sup> with its long term sequel of tubal damage and consequent increased risk of EP and tubal factor infertility. Unlike in the developed societies with liberal abortion laws therefore safe abortion practices, this abortion-related risk factor operates mainly in the developing countries with restrictive laws. Incidence of ectopic pregnancy was 2.8% of live births and 2.3% of all the pregnancies managed at the center within the study period and this was lower than the report at this center about six years previously,<sup>[10]</sup> one other report from the region<sup>[4]</sup> and in the northern Nigeria.<sup>[6, 16]</sup> This may be ascribed to the recent increase in the number of health facilities in this setting that share the cases of EP. This however, was higher than a number of other reports both within and outside Nigeria.<sup>[1-2, 6, 11, 13, 17-18]</sup> This may be attributable to the high incidence of pelvic infection in this setting from unsafe abortion, pelvic inflammatory disease and puerperal sepsis. In addition, ovulation induction and assisted reproductive technology is on the increase in this setting coupled with the increasing awareness of ectopic pregnancy, its risk factors and impact. Ectopic pregnancy constituted 6.3% of all the gynaecological admissions. This was lower than another report from the region,<sup>[4]</sup> higher than others from southwestern and southeast Nigeria respectively<sup>[11, 13]</sup> but comparable to other local reports.<sup>[5, 18]</sup> Ectopic pregnancy contributed 23.9% of the gynaecological surgeries lower than the 39.88% previously reported at the study center six years ago.<sup>[10]</sup> It contributed 17.1% of first trimester pregnancy loss in the studied period. In this data EP was second to abortion as the leading contributor of early pregnancy wastage.

The leading identifiable risk factor in this study was previous induced abortion (72.7%) corroborating other reports<sup>[4-5, 13]</sup> unlike previous pelvic infection reported by other researchers.<sup>[11]</sup> Previous intra-abdominal surgery (23.6%) and multiple sex partners (21.5%) also contributed substantially to the occurrence of ectopic pregnancy in this study consistent with another report.<sup>[3]</sup> The risk factors for ectopic pregnancy are traceable to the conditions that previously resulted in tubal architectural distortion or alteration of the microenvironment.<sup>[1]</sup> Abdominal or pelvic adhesions from intra-abdominal and pelvic surgery or peritubal infection can distort and kink the fallopian tubes increasing the risk of ectopic pregnancy. Similarly, endosalpinx infection by chlamydial trachomatis or gonococcal agents is prevalent in the study settings with increased incidence of ectopic pregnancy by damaging, partially blocking and impairing the tubal mucociliary action.

Overall, the cases occurred at the mean gestational age of 8.4 weeks and median 8.0 weeks and this was higher than another report and lower than one other each by about one week respectively.<sup>[11, 18]</sup> The predilection was highest for the tube at 94.5% and for the ampulla at 69.2%. This reported tubal pregnancy rate was comparable to other reports.<sup>[3, 11, 19]</sup> This was predominantly in the left tube 51.9%, ampullary 69.2% and isthmic 17.3%. Another similar local study also reported the preponderance of left tubal ectopic pregnancy than the right.<sup>[6]</sup> It is thought that the occurrence of appendicitis in the right iliac fossa increases the risk of ectopic pregnancy on the side. However, it is evident that appendicitis alone ruptured or unruptured is not but appendectomy is significantly associated with increased risk of ectopic pregnancy.<sup>[20-21]</sup> Nonetheless, current hypothesis is that tubal pregnancy results from a combination of impaired tubal embryo transport and altered tubal environment favoring early implantation.<sup>[19]</sup>

Abdominal pain (96.4%) was the commonest clinical presentation in the patients in consonant with other reports.<sup>[1, 4-6, 13, 18]</sup> A combination of amenorrhea and abdominal pain in a sexually active woman of reproductive age calls for immediate exclusion of ectopic pregnancy. In many cases the pain begins unilaterally indicating the side of rupture and later becomes more generalized through the suprapubic region to the general abdomen as the hemoperitoneum and peritoneal irritation increase. Innocuous early pregnancy painful ovarian corpus lutein cyst must be excluded in unilateral pain.<sup>[1]</sup> Abdominal pain was followed by dizziness/fainting spell (58.2%), vaginal bleeding (41.8%) and vomiting (27.3%) in that order. Gastrointestinal symptoms recorded in this study; vomiting 27.3% and diarrhea 5.5% are rare presentation in EP and should raise the suspicion of EP in early pregnancy especially when accompanied by dizziness.<sup>[3]</sup>

The Mean estimated blood loss was  $1593.6 \pm 702.8$ mls. The interstitial and isthmic EP occur less frequently in these portions of the tube than ampullary but they are significantly associated with more blood loss. The majority; 85.5% were anemic at presentation and a median IQR 2(1-3) units of blood were transfused in 89.1% patients.

Currently ectopic pregnancy management aims at early diagnosis with the current improved diagnostic techniques and fertility reserving treatment approach for unruptured cases. However, all the patients in this study presented late with ruptured ectopic pregnancy as emergency through the Accident and emergency unit of the hospital. They all had laparotomy with ipsilateral salpingectomy in 92.7% of the cases as the tubes were too damaged for conservative surgeries. In the study setting, the first visit for abdominal pain and other disorders is to the traditional birth attendants' (TBA) homes for abdominal massage and this is very common practice by the locals. A large proportion (40.0%) of the patients reported prior abdominal

massage by the TBAs and this may have accounted for increased rate of rupture and late presentation seen in this data.

One death occurred; a case fatality of 1.56% comparable to other reports,<sup>[6, 11]</sup> and higher than the report from Port Harcourt in the same region of Nigeria.<sup>[4]</sup> Ectopic pregnancy is a recognized cause of first trimester pregnancy loss and contributes as much as 54% of first trimester maternal death and 2-3% the overall maternal death in the United Kingdom.<sup>[3, 22]</sup> The recorded case fatality was lower than report of up to 10% death from diagnosed ectopic pregnancy in literature.<sup>[1, 23]</sup> Substandard care is the major cause of the associated mortality.<sup>[3]</sup>

The data in this study were majorly retrospectively generated and this may have introduced some deficiencies. This is because the data relied heavily on the availability and accuracy of the records. Prospective data are more likely to be more complete and reliable.

## CONCLUSION

Ectopic pregnancy is a significant cause of maternal morbidity and mortality. Previous tubal damage is key in its occurrence. Improved contraception, liberalization of abortion laws, prompt diagnosis and treatment will mitigate the impact of ectopic pregnancy.

## REFERENCES

1. Vanitha N Sivalingam, W Colin Duncan, Emma Kirk, et al Diagnosis and Management of Ectopic Pregnancy. J Fam Plann Reprod Health Care 2011; 37:231–240. doi:10.1136/jfprhc-2011-0073
2. Vicken P Sepilian, Ellen Wood. Ectopic Pregnancy. Last Updated Aug, 17 2007.
3. George Condous. Ectopic pregnancy. Dewhurst's Textbook of Obstetrics and Gynaecology. D. Keith Edmonds and Christoph Lees, Tom Bourne (ed), 9<sup>th</sup> Edition, Hoboken, NJ: Wiley Blackwell; 2018:43 pp589-596
4. Celestine Osita John, Justina Omoikhefe Alegbeye. Ectopic pregnancy experience in a tertiary health facility in South-South

- Nigeria. The Nigerian Health Journal 2016; 16 ( 1):1-15
5. Gharoro EP, Igbafe AA. Ectopic pregnancy revisited in Benin City Nigeria:analysis of 152 cases Acta Obstetrica et Gynecologica Scandinavica 2002; 81(12):1139-1143
  6. Panti A, Nwobodo I E, Lukman OO et al Ectopic pregnancy at Usmanu Danfodiyo University Teaching Hospital Sokoto: a ten year review. Ann Niger Med 2012;6(2):87–91.
  7. Campbell S, Monga A. Disorders of Early Pregnancy. Gynaecology by Ten Teachers, 17<sup>th</sup> Edition, Campbell S and Monga A (Eds)Gutenberg Press Ltd Malta.2000;pp99-112
  8. Jurkovic D. Ectopic pregnancy. In: Edmonds K, editor. Dewhurst`s Textbook of Obstetrics and Gynaecology for postgraduates. 7th. Ed. Oxford: Blackwell Science; 2007:106-116.
  9. Olusanya O, Okpere E, Ezimokhai M. The importance of social class in voluntary fertility control in a developing country. West Afr J Med 1985; 4:205-11
  10. Ekine A A, Harry C T, Ibrahim IA, et al Ectopic Pregnancy in NDUTH, Okolobiri- 5 Year Case Retrospective Review. Indian Journal of Medical Research and Pharmaceutical Sciences 2014; 1(7) ISSN: 2349 – 5340
  11. Olamijulo JA, Okusanya BO, Adenekan MA, et al Ectopic Pregnancy at Lagos University Teaching Hospital Lagos, south-west Nigeria: temporal Trends, clinical Presentation and Management Outcomes from 2005 to 2014 Niger Postgrad Med J 2020;27(3):177-83
  12. Udigwe GO, Umeonihu OS, Mbuchu II. Ectopic pregnancy: A 5 year review of cases at Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi. Niger Med J 2010;51:160-3.
  13. Etuknwa BT, Azu OO, Peter AI, et al. Ectopic pregnancy: A Nigerian urban experience Korean J Obstet Gynecol 2012;55:309-14.
  14. Lawani OL, Anozie OB, Ezeani PO et al Ectopic pregnancy: a life-threatening gynaecological emergency; International Journal of Women`s Health 2013;5 515-21.
  15. Maduabuchi Eugene Ikeanyi, Chukwunwendu Anthony Okonkwo. Complicated illegal induced abortions at a tertiary health institution in Nigeria. Pak J Med Sci. 2014; 30(6): 1398–1402. doi: 10.12669/pjms.306.5506
  16. Yakasai IA, Abdullahi J, Abubakar IS. Management of ectopic pregnancy in Aminu Kano Teaching Hospital Kano Nigeria: 3 year. Global Advanced Research Journal of Medicine and Medical Sciences (ISSN:2315-5159) 2012; 1(7):181-185
  17. Ezegwui HU, Onoh RC, Ikeako LC, et al. Investigating maternal mortality in a public teaching hospital, Abakaliki, Ebonyi State, Nigeria. Ann Med Health Sci Res. 2013; 3(1):75–80.
  18. Igwegbe A, Eleje G, Okpara B, An Appraisal of the Management of Ectopic Pregnancy in a Nigerian Tertiary Hospital. Ann Med Health Sci Res. 2013; 3(2):166-70
  19. Shaw JL, Dey SK, Critchley HO, et al Current knowledge of the aetiology of human tubal ectopic pregnancy. Hum Reprod Update 2010;16:432–444.
  20. Elraiyyah T, Hashim Y, Elamin M, et al The effect of appendectomy in future tubal infertility and ectopic pregnancy a systematic review and meta-analysis. J Surg Res. 2014;192(2):368-74
  21. Fernandez H, Coste J, Job-Spira N. Appendectomy ,a risk factor for ectopic pregnancy. Presse Med ;1992;21(39):1859-61
  22. Newbatt E, Beckles Z, Ullman R et al. Ectopic Pregnancy and Miscarriage: summary of NICE Guidance. BMJ 2012; 345:e8136.
  23. Leke RJ, Goyaux N, Matsuda T, et al. Ectopic pregnancy in Africa: a population-based study. Obstet Gynecol 2004;103:692–697.
- How to cite this article: Ikeanyi EM, Ikobho HE. Ectopic pregnancy: a review of clinical presentation and management in Niger Delta University Teaching Hospital, Bayelsa State Nigeria. *Int J Health Sci Res.* 2021; 11(3): 128-135.

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