

Thesis

Ectopic Pregnancy Risk Factors Presentation and Management Outcomes

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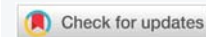
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Keywords: Ectopic; Pregnancy; Risk; Presentation; Management; Outcomes



Abstract

Background: Ectopic pregnancy (EP) is a common and serious early pregnancy problem with a significant morbidity rate and the potential for maternal death. Women commonly present with minimal vaginal bleeding and abdominal pain.

Objective: The main objective of the study was to evaluate the risk factors, clinical presentation, sites, and management outcomes of ectopic pregnancies.

Methodology: It was a prospective descriptive, cross-sectional hospital-based study conducted at Bashair Teaching Hospital during the period January 2021–June 2021.

An interview questionnaire was used, and eighty-two (82) women were included after informed consent. Demographic and clinical data concerning personal history, symptoms of presentation, risk, site, and type of management were recorded.

Results: Ectopic pregnancy incidence was 2% and most risk factors were infection 29.3%, surgery 15.9%, miscarriage 13.4%, infertility 12.2%, tubal surgery 4.9%, previous ectopic pregnancy 4.9%, intrauterine contraceptive device (IUCD) 3.6%, and tubal ligation 2.4%. Women presented with bleeding and abdominal pain at 47.5%, bleeding at 18.3%, abdominal pain at 9.7%, and shock at 8.5%.

The sites are ampullary (57.3%), fimbria (9.7%), interstitial (8.5%), isthmus (8.5%), ovarian (7.3%), cervical (4.8%), and abdominal (3.6%).

Surgical management was 93.9%, medical and surgical management was 3.6% and medical management was 2.4%. A blood transfusion was received at 37.8%.

Conclusion: The study concluded that women of reproductive age are at risk of ectopic pregnancy, so healthcare providers and doctors should have a high index of suspicion, prompt diagnosis, and intervention for ectopic pregnancy. Assessment of women at risk factors and modifications will reduce incidence.

Introduction

Ectopic pregnancy is defined as a pregnancy that occurs outside of the uterine cavity. The most common site of ectopic pregnancy is the fallopian tube, this type of ectopic pregnancy is called tubal pregnancy.

Sometimes, an ectopic pregnancy occurs in other areas of the body, such as the ovary, abdominal cavity, or the lower part of the uterus (cervix), which connects to the vagina.

Most cases of tubal ectopic pregnancy (EP) that are detected early can be treated successfully either with minimally invasive surgery or with medical management using methotrexate [1].

Risk Factors for Ectopic Pregnancy are age of more than 35 years, cigarette smoking, documented fallopian tube pathology, history of Infertility, pelvic inflammatory disease, pregnancy while an intrauterine device is in place, pelvic



surgery, previous ectopic pregnancy, previous fallopian tube surgery and in vitro fertilization [2,3].

Sites of ectopic pregnancy are, tubal 95%, interstitial 2%-4%, Ovarian < 3%, heterotopic 1%-3%, abdominal, 1% cesarean scar, < 1% and cervical < 1% [4-6].

Ectopic pregnancy should be considered in any pregnant woman with amenorrhea, vaginal bleeding, or lower abdominal pain when intrauterine pregnancy has not yet been diagnosed vaginal bleeding in women with ectopic pregnancy is due to the sloughing of decidual endometrium which can range from spotting to menstruation-equivalent levels [2,7].

Diagnosis of ectopic pregnancy by serum Beta-human chorionic gonadotrophin (β -hCG) levels in correlation with transvaginal ultrasound (TVUS) or transabdominal ultrasound (TAUS) findings. TVUS is more accurate and sensitive than TAUS in diagnosing early EP [8]. Specifically, three-dimensional TVUS combined with color Doppler US was shown to be more effective than conventional 3-dimensional ultrasound (3D-US) for the diagnosis of early cesarean scar pregnancy [9].

Ectopic pregnancy can be managed with conservative, medical or surgical treatment according to presentation and the woman's general conditions and it depends on EP location, pregnancy timeline, and gestational sac size.

Expectant management is the most conservative approach for the treatment of EPs. This method can be considered for patients with decreasing or plateaued β -hCG levels.

Medical management by intramuscular methotrexate (MTX) injection is the current standard for medical management of EPs [2]. It has some contraindications which include hemodynamic instability, anemia, leukopenia, thrombocytopenia, pelvic pain or hemoperitoneum [10], indicative of EP rupture, renal or hepatic insufficiency, pulmonary disease, active peptic ulcer disease, coinciding IUP, breastfeeding, fetal cardiac activity, serum β -hCG levels > 5000 mIU/mL, or EP > 4 cm in diameter.

Surgical management is indicated in patients exhibiting MTX contraindications. MTX is administered in single, double, or multi-dose regimens. Double dose protocol is more effective than single dose [11].

Surgical management Salpingostomy and salpingectomy are the two common approaches for surgical management of EPs, which are done by opened laparotomy or laparoscopy [12].

The treatment in developing countries, surgery remains the mainstay of treatment, mostly performed in an emergency, with frequent tubal rupture and hemoperitoneum [13]. If the ectopic pregnancy has been diagnosed, the patient is hemodynamically stable, and the affected fallopian tube has

not ruptured, treatment options include medical management with intramuscular methotrexate or surgical management with salpingostomy (removal of the ectopic pregnancy while leaving the fallopian tube in place) or salpingectomy (removal of part or all of the affected fallopian tube) [7].

The decision to manage the ectopic pregnancy medically or surgically should be informed by individual patient factors and preferences, clinical findings, ultrasound findings, and β -hCG levels. Expectant management is rare but can be considered with close follow-up for patients with suspected ectopic pregnancy who are asymptomatic and have very low β -hCG levels that continue to decrease [7,14].

Materials and methods

It was a descriptive prospective cross-sectional hospital-based study conducted at Bashair Teaching Hospital during the period January 2021 – June 2021.

The Study population that was included all women diagnosed with ectopic pregnancy who came during the study period to the gynecology clinic and emergency room, and they agreed to participate in the study. About 82 women who were diagnosed with ectopic pregnancy were included.

Data was collected by direct interview by using a well-structured questionnaire. The participants were interviewed about age, education, gestational age, parity, risk factors for ectopic pregnancy, type of ectopic, management type, hospital stay, Anti-D administration, and blood transfusion.

Statistical analysis was performed via SPSS software (SPSS, Chicago, IL, USA). Continuous variables were compared using the student's *t* - test (for paired data) or the Mann-Whitney U test for nonparametric data. For categorical data, a comparison was done using the Chi-square test (χ^2) or Fisher's exact test when appropriate. A *p* - value of < 0.05 was considered statistically significant.

Ethical considerations

Ethical consideration was taken, and it was presented to the ethics review committee of Alneelain University, obstetrics, and gynecology department and approved, permission to conduct the study was requested from authorities of health care in Bashair Hospital, data was handled with a high degree of confidentiality throughout the study, and written informed Consent was taken from all participants in the study.

Results

During the study period total of 4091 pregnant women came to the hospital, and 82 were diagnosed with ectopic pregnancy, so the incidence of ectopic pregnancies is found in approximately 2% of all pregnant women. Risk factors for ectopic pregnancy are strongly associated with conditions that cause alterations to the normal mechanism of fallopian tubal transport of fertilized ovum. Most study population

age < 20 years 37.8% mean 2.1463, most women secondary school education 40.2%, multiparous were 53.7% and most gestational age of presentation (6-7) weeks 51.2% followed by (8-9) weeks 32.9% (Table 1).

In our study infection was the most identified risk for ectopic pregnancy at 29.3% followed by pelvic surgery at 15.9%, miscarriage at 13.4%, infertility at 12.2%, tubal surgery at 4.9%, tubal surgery is closely linked to the underlying tubal damage caused by a previous ectopic pregnancy or pelvic inflammatory disease. Previous ectopic pregnancy was 4.9%, IUCD was 3.6% and tubal ligation is the least risk factor at 2.4%, tubal ligation failures also confer a high risk for ectopic pregnancy (Table 2).

Twelve women who managed by surgery β -hCG not undertaken due to their emergency presentation and only one woman was in medical treatment (Table 3).

All women presented with shock were managed surgically, medical treatment in the form of methotrexate was offered to only two women who had no contraindications and three women of cervical ectopic pregnancy received misoprostol and surgical evacuation (Table 4).

All interstitial ectopic pregnancies 7, ampullary 47 women, and ovarian 6 and abdominal three women were managed by surgical methods. Two isthmic ectopics managed with methotrexate and three cervical ectopics managed with medical and surgical evacuation p - value .000. Table 5. Regression risk factors for ectopic pregnancy (Table 6).

Women managed by surgery received blood transfusion were 31 women while medically treated women do not need blood transfusion p - value .04 (Table 7).

Outcomes of management of ectopic pregnancy with low hospital stay and no maternal mortality, those rhesus negative received Anti-D postoperative, and all women received antibiotics except two (Figures 1,2).

Discussion

The incidence of ectopic pregnancy in our study was 2% similar to [2] and lower than [15] study conducted in Nigeria found an incidence of 2.2% comparable with [16]. Most women in this study are presented at less than the age of 26 years 68.3%, multiparous 53.7%, this is due to early marriage, neither age nor parity is significantly associated with the risk of ectopic pregnancy. Most cases of ectopic pregnancy were presented at 6-7 weeks 51.2%.

The common presentation of EP is vaginal bleeding and lower abdominal pain in a woman with amenorrhea was 47.5%, women who have an EP typically complain of brown vaginal discharge soon after a missed period, sometimes progressing to heavier bleeding similar to a miscarriage, only bleeding was 18.3%, abdominal pain 9.7% and asymptomatic women were 9.7%.

Table 1: Sociodemographic characteristic of the study population ($n = 82$)

Characteristic	Frequency	Percent	Mean	Std. Deviation
Age < 20	31	37.8	2.1463	1.19796
20-25	25	30.5		
26-30	14	17.1		
31-35	7	8.5		
> 35	5	6.1		
Education				
Primary	28	34.1		
Secondary	33	40.2	2.0122	.94925
University	13	15.9		
Postgraduate	8	9.8		
Parity				
Nulliparous	23	28		
Multiparous	44	53.7	1.9024	.67786
Grand multiparous	15	18.3		
Gestational age				
6-7 weeks	42	51.2	1.9634	.98689
8-9 weeks	27	32.9		
10-11 weeks	5	6.1		
≥ 12 weeks	8	9.8		
Total	82	100		

Table 2: Risk of ectopic pregnancy among study population ($n = 82$).

Risk	Frequency	Percent	Mean	Std
Infection	24	29.3	1.7073	.45779
Surgery	13	15.9	1.8415	.36749
Ectopic	4	4.9	1.9512	.21673
Tubal surgery	4	4.9	1.9512	.21673
Miscarriage	11	13.4	1.8659	.34291
Infertility	10	12.2	1.8780	.32924
IUCD	3	3.6	1.9634	.18890
Tubal ligation	2	2.4	1.9756	.15521
No risk	11	13.4	1.8659	.34291
Total	82	100		

Table 3: Management of ectopic pregnancy and β -hCG test ($n = 82$).

β -hCG	Treatment			Total
	Surgical	Medical	Medical and Surgical	
Performed	65	1	3	69
Not performed	12	1	0	13
Total	77	2	3	82

Chi-square 2.317; p - value .02

Table 4: Management of ectopic pregnancy and presentation symptoms ($n = 82$).

Symptoms	Treatment			Total
	Surgical	Medical	Medical and Surgical	
Bleeding	14	1	0	15
Pain	7	1	0	8
Bleeding & pain	37	0	2	39
Shocked	7	0	0	7
Asymptomatic	7	0	1	8
Total	77	2	3	82

Chi-square 9.200; p - value .022



Table 5: Management of ectopic pregnancy and site of ectopic pregnancy (n = 82).

Site of ectopic	Treatment			Total
	Surgical	Medical	Medical and Surgical	
Interstitial	7	0	0	7
Isthmus	5	2	0	7
Ampullary	47	0	0	47
Fimbrial	8	0	0	8
Ovarian	6	0	0	6
Abdominal	3	0	0	3
Cervical	1	0	3	4
Total	77	2	3	82

Pearson Chi-Square 82.6; p - value .000

Table 6: Regression of risk factors of ectopic pregnancy (n = 82).

Risk Factors	Had Risk	No risk	OR	95% CI
Pelvic infections Yes 24 No 58	24 26	0 32	5.345	3.055-9.721
Pelvic surgery Yes 13 No 69	11 39	2 30	4.231	.871-20.541
Miscarriage Yes 11 No 71	10 40	1 31	7.750	.941-63.825
Subfertility Yes 10 No 72	10 40	0 32	1.164	1.059-1.1279
Previous ectopic Yes 4 No 78	4 46	0 32	1.060	1.001-1.122
Tubal surgery Yes 4 No 78	4 46	0 32	1.060	1.001-1.122
Tubal ligation Yes 2 No 80	1 49	1 31	1.029	.989-1.071
IUCD Yes 3 No 79	2 1	48 31	1.044	.994-1.096

Table 7: Management of ectopic pregnancy and blood transfusion (n = 82).

Symptoms	Treatment			Total
	Surgical	Medical	Medical and Surgical	
Transfused	31	0	0	31
Not transfused	46	2	3	51
Total	77	2	3	82

Pearson Chi-Square 3.237a; p - value .04

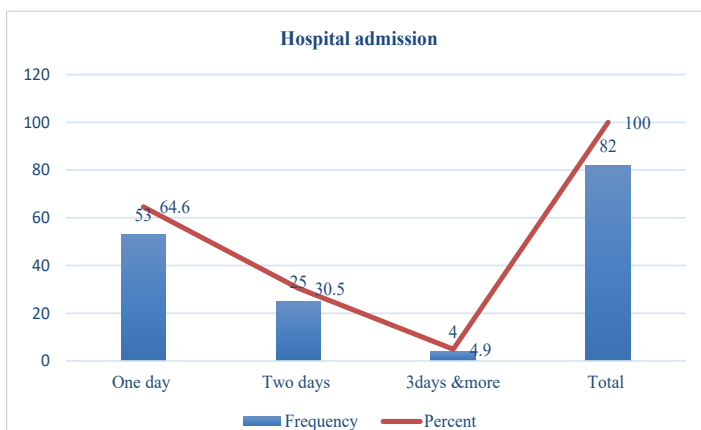


Figure 1: Hospital admission duration of study populations (n = 82).

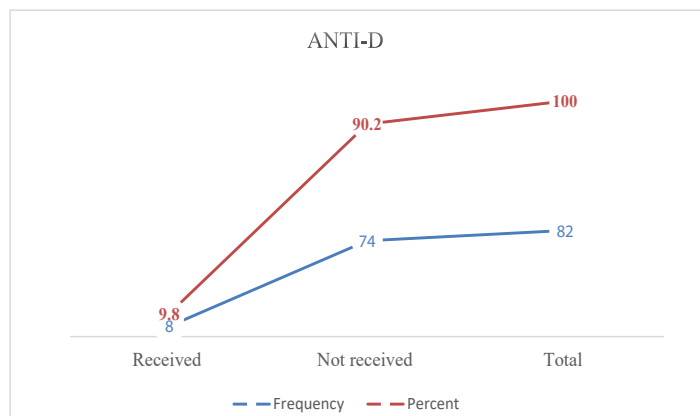


Figure 2: Anti-D received by ectopic pregnancy study populations (n = 82).

The nature, location, and severity of pain in ectopic pregnancy vary, it often begins as a colicky abdominal or pelvic pain that is localized to one side as the pregnancy distends the fallopian tube. The pain may become more generalized once the tube ruptures and hemoperitoneum develops and the patient may be presented with shock, shocked women were 8.5%. Other potential symptoms include presyncope, syncope, vomiting, diarrhea, shoulder pain, lower urinary tract symptoms, rectal pressure, or pain with defecation [17].

Diagnoses of ectopic pregnancy based on detection of Beta human chorionic gonadotropin β -hCG and ultrasound scan, β -hCG can be detected in pregnancy as early as eight days after ovulation [18]. All women underwent ultrasound scans and β -hCG was performed in 84.1% of women this was explained by the emergency presentation.

The most common identifiable risk factor among our patients was previous pelvic infections 29.3% OR 5.345 CI 3.055-9.721. Previous studies have reported a strong association between prior PID and EP with OR ranging from 2.0 to 10.1 [19].

Previous pelvic surgery was a major risk factor for developing ectopic pregnancy 15.9%, OR 4.231 95% CI (.871-20.541) which is comparable to [20,21], which it has been reported that previous tubal surgery is a major risk factor for EP with an estimated OR of 4.7 (2.4-9.5).

Miscarriage was 13.4% among study women OR 7.750 95%CI(.941-63.825) similar to [20] and another study [22] and our study showed the association of prior spontaneous miscarriage with increased risk of EP because of this relationship most likely due to infection,

A strong association between a history of subfertility and risk of EP was also detected at 12.2%, OR 1.164, and 95% CI (1.059-1.1279) which may be due to a significant role of hyperstimulation in the induction of ovulation, with high estrogen levels [23]. This finding is further supported by another study [22], while previous ectopic pregnancy occurred in 4.9% of the cases OR 1.060 and 95% CI (1.001-1.122), tubal



surgery 4.9%, OR 1.060 and 95% CI (1.001-1.122), previous tubal surgery it has been reported that previous tubal surgery is a major risk factor for EP with an estimated OR of 4.7 (2.4-9.5) according to a meta-analysis [21].

Tubal pregnancy may occur in a blocked tube with contralateral tubal patency in this case, the sperm migrates across the abdomen to fertilize an egg released from the blocked side, tubal ligation is the least risk factor 2.4%, OR 1.029 95% CI (.989-1.071) which is lower than [24] which could be explained by a small number of women with bilateral tubal ligation.

IUCD users had OR 1.044 and 95% CI (.994-1.096), Early studies on risk factors of EP indicated that OR greater than one belonged to current IUD use [24,25], and in 13.4% of patients there were no identifiable risk factors.

In most of the patients, 65.8% reported abdominal pain as the main complaint at the time of presentation, which is in line with other studies vaginal bleeding was reported in 74.3% of the cases, making it the second most common reason for attending to the hospital. Similarly, vaginal bleeding was mentioned in many studies, whereas other studies found that pain and amenorrhea were the main symptoms which are comparable to [26]. Patients in hypovolemic shock accounted for 3.5%, which is lower than [26].

At the surgery of ectopic pregnancies, 57.3% were found in the ampullary part of the fallopian tube which is comparable to [15] which found the most common site of tubal ectopic was (ampullary in 52%, Fimbrial 9.7%, interstitial 8.5%, isthmus 8.5% and ovarian 7.3%), also our study similar to other studies [26-28].

The increased incidence of ovarian ectopic pregnancies is associated with the increased use of artificial reproductive technologies (ART) and intrauterine contraceptive devices (IUCDs) [29].

Presurgical diagnosis of cervical ectopic pregnancy was 4.8% and abdominal ectopic pregnancy was 3.6% which was undertaken by ultrasound scan.

All interstitial ectopic pregnancies 7, ampullary 47 women, ovarian 6, and abdominal three women were managed by surgical methods. Two isthmic ectopics managed with methotrexate and three cervical ectopics managed with misoprostol and surgical evacuation *p* - value .000.

In this study two women with ectopic pregnancy were selected for treatment with methotrexate they had no contraindications, received a double dose regimen, and were offered follow-up, the time to resolution was 4 weeks, and the median time to resolution for ectopic pregnancies treated with methotrexate was 22 days, with the majority resolved within 5 weeks [30].

There were three women diagnosed with cervical ectopic

pregnancy with minimal bleeding, they received medical treatment with misoprostol according to protocol and offered surgical evacuation, totally cured, and no postoperative complications.

All tubal ectopic pregnancies were managed by surgery offered salpingectomy, a radical surgery like salpingectomy could help avoid a recurrence of ectopic pregnancy at the same site. However, it is considered to decrease the chances of becoming pregnant. In a randomized control trial, the pregnancy rate among patients in the salpingostomy group was not better than that among those in the salpingectomy group when the contralateral tube was healthy [31,32], and all received antibiotics.

The blood transfusion rate was 37.8% and the probability of blood transfusion was also higher in ruptured ectopic pregnancy than in unruptured ectopic pregnancy. Thus, preoperative estimation of the amount of intra-abdominal blood loss using the ultrasound scan might be useful in predicting tubal ruptures which is like [22,33].

Hospital stays for one day among 64.6%, rhesus negative women 9.8% were received. Anti-D intramuscular. All products were sent for histopathology. No patient had uncontrolled bleeding and did not require a hysterectomy. No cornual ectopic pregnant patient could be managed medically because all were ruptured ectopic pregnancies. The success rate for surgical treatment was 100%, as shown in other studies [22,27].

A significant limitation of this study was the small number of study populations, as well as the study period and laparoscopic surgery not used in the management of ectopic pregnancy. The study was conducted at one hospital, multicenter study can help in comparison. However, the study's main strength was that the study covered all patients, and several types of ectopic pregnancy in a low-income setting and showed patterns that could be reviewed for future clinical and research uptake.

Conclusion

This study concluded that ectopic pregnancy is a common and serious problem, many patients have no documented risk factors and no physical indications of ectopic pregnancy. Our study demonstrated major risk factor for ectopic pregnancy was an infection which could be reduced by the detection of genital tract infection and treated pre-pregnancy at the genitourinary tract clinic. Early diagnosis of ectopic pregnancy will reduce morbidity and mortality.

Most women present with ruptured ectopic pregnancy so public health awareness should be raised and doctors should be trained for ultrasound scans to enable early detection of ectopic pregnancy. Surgical management of ectopic pregnancy is a lifesaving intervention. Medical treatment has a high success rate in selected cases who has no contraindications. Although different management options are available, the best



outcome is achieved if the management of EP is done at the earliest without any delay. Further study to evaluate medical, laparoscopic management and auditing of diagnosis.

Recommendations

To the hospital management, an excellent quality ultrasonography machine should be available, and 24-hour ultra-sonographer radiologists should be present to train the medical team. The provision of facilities and training of healthcare professionals on the modern management of ectopic pregnancy will lead to improved treatment outcomes.

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Ethical consideration

Ethical considerations taken from Alneelain University faculty of medicine, head department of obstetrics and gynecology and Bahair Teaching Hospital.

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