



STUDY OF RISK FACTORS ASSOCIATED WITH ECTOPIC PREGNANCY: AN OBSERVATIONAL STUDY

Obstetrics & Gynaecology

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ABSTRACT

Background: Any pregnancy in which the fertilised ovum gets implants outside the uterine cavity is an ectopic pregnancy. Since none of the extrauterine areas can support placental attachment or a developing embryo, it invariably risks rupture and haemorrhage so it is considered as a life-threatening emergency. Lower abdominal pain with vaginal bleeding in women of reproductive age raises the suspicion of an ectopic pregnancy. However, this is not always the case; some may present vague symptoms, oblivious to the underlying pathology. Hence our study aimed to document the potential risk factors for ectopic pregnancy. **Methods:** This prospective study was carried out at a tertiary care hospital and included 60 women diagnosed with ectopic pregnancy. A detailed history, menstrual and obstetric history, clinical examination, urine pregnancy test, and ultrasonography were obtained from each patient. Their clinical profile was noted, including their name, age, marital status, socioeconomic status, parity, and last childbirth. A list of potential risk factors was compiled. The general, systemic, abdominal and bimanual examination was done. Data were collected and evaluated. **Results:** 60 cases of ectopic pregnancies were diagnosed during the study period. The highest number of patients were noted in the 20-24 years age group (n=21) and the least in the 35-39 years age group (n=1). Pain in the abdomen was the most commonly noted symptom at 88.3%, followed by bleeding per vaginum (76.7%), vomiting (73.3%), fainting (58.3%), shock (30.0%), and abdominal distention (21.7%). While 18.3% of cohorts did not present with any risk factor, pelvic inflammatory disease (n=13) was the most commonly noted risk factor. **Conclusions:** Ectopic pregnancy is a life-threatening obstetric emergency which requires a keen eye for detail. A comprehensive narrative of clinical history, signs and symptoms aided by appropriate diagnostic tools will help sidestep fatalities.

KEYWORDS

Ectopic pregnancy, Pelvic inflammatory disease, Risk factors, Maternal mortality, Pregnancy.

INTRODUCTION:

Any pregnancy in which the fertilised ovum implants outside the intrauterine cavity is an ectopic pregnancy. It is the primary cause of maternal mortality during the first trimester, accounting for 10 to 15% of all maternal deaths.^{1,2} It finds its origin in the Greek word "ektopos," connoting out of place. Over 95% of ectopic pregnancies arise in the fallopian tubes, about 2.5 percent in the uterine cornua, with the rest in the ovary, cervix, or abdominal cavity. Since none of these extrauterine areas can support placental attachment or a developing embryo, it invariably risks rupture and haemorrhage. It is thus considered a life-threatening emergency.^{1,3,4,5} Lower abdominal pain with vaginal bleeding in women of reproductive age arises the suspicion of an ectopic pregnancy. However, this is not always the case; some may present vague symptoms, oblivious to the underlying pathology. Whether or not the ectopic pregnancy has ruptured, the signs and symptoms will differ. Abdominal pain, vaginal bleeding, and amenorrhea/positive urine pregnancy test are the typical trio of signs of an ectopic pregnancy. Age, history of ectopic pregnancy, pelvic inflammatory illness, infertility history, previous pelvic surgery, cigarette smoking, oral contraceptives, multiple lifetime sexual partners, older maternal age, and in utero diethylstilbestrol exposure, use of intrauterine devices (IUDs), induced ovulation, female sterilisation, and family history are some of the implicated risk factors. To diagnose an ectopic pregnancy, a detailed history and physical examination are required, as well as a correlation with advanced diagnostic tools.^{4,6,7}

An extensive understanding of ectopic pregnancy combined with early recognition will enable women to make informed decisions and prove a lifesaver. Hence, this study was conducted to provide more light on the risk factors associated with ectopic pregnancy.

METHODS:

This prospective study was carried out at DR. S.N. Medical College and associated hospital from June 2022 to February 2023. The study included 96 women with a diagnosis of ectopic pregnancy. Only those who consented to be part of the study were included; those who had an intrauterine pregnancy or abortion were excluded. Detailed history, menstrual and obstetric history, clinical examination, urine pregnancy test, and ultrasonography were obtained for each patient. Their clinical

profile was noted, including their name, age, marital status, socioeconomic status, parity, and last childbirth. A comprehensive history of symptoms was recorded. A list of potential risk factors was compiled. The general, systemic, abdominal and vaginal examination was done. All the patients were thoroughly evaluated, and their vital signs were recorded. We looked for signs that could indicate an ectopic pregnancy. The triad of investigations-urine pregnancy test, serum human chorionic gonadotropin (hCG), and transvaginal ultrasound-were performed on all women with clinical suspicion of ectopic pregnancy. Data were presented as frequency and percentage.

RESULTS:

A total of 96 cases of ectopic pregnancies were diagnosed during the study period. The highest number of patients were noted in the 21-25 years age group (n=34) and the least in the >35 years age group (n=6). Forty-two were primipara, and the rest were multiparous. The majority of patients (52%) were of lower socioeconomic status. The demographics are depicted in Table 1.

Table No 1: Demographics

AGE GROUP	FREQUENCY	PERCENTAGE
< 20 years	10	10.41
21-25 years	34	35.41
26-30 years	28	29.61
31-35 years	18	18.75
>35 years	6	6.25
PARITY		
PRIMIPAROUS	42	43.75
MULTIPAROUS	54	56.2
SOCIOECONOMIC STATUS		
LOW	52	55
MIDDLE	35	36.7
HIGH	13	8.3

Symptoms:

Symptoms include pain in the abdomen was the most commonly noted symptom at 82.29%, followed by amenorrhea (73.95%), bleeding per vaginum (59.38%), fainting (18.75%) and vomiting (10%).

Table no. 2: Symptoms

SYMPTOMS	NO. OF CASES	PERCENTAGE
Amenorrhea	71	73.95
Pain abdomen	79	82.29
Bleeding per vaginum	57	59.38
Fainting	18	18.75
Shoulder pain	5	5.20
Bladder symptoms	3	3.13
Bowel symptoms	0	0.0
fever	6	6.25
vomiting	10	10.41
Passing of fleshy cast	3	3.13

Associated risk factors:

While 18.3 % of cohorts did not present with any risk factor, pelvic inflammatory disease (n=13) was the most commonly noted risk factor (Table 3).

Table No. 3: Associated Risk Factors

Risk factors	No. of cases	percentage
PID	24	25
NO RISK FACTORS	22	22.9
ABORTION	21	21.87
D&C	21	21.87
PREVIOUS H/O LSCS	12	12.50
PUERPERAL SEPSIS	12	12.50
IUCD	10	10.41
ABORTION	10	10.41
LAP. STERILIZATION	8	8.33
OCP	8	8.33
PREV H/O ABDO. SURGERY	8	8.33
PREV H/O ECTOPIC PREGNANCY	5	5.20
SECONDARY INFERTILITY	4	4.16
TB	3	3.13
PRIMARY INFERTILITY	3	3.13
ABD. STERILIZATION PROCEDURES	1	1.07

DISCUSSION:

In the study group, 96 cases of ectopic pregnancies were enrolled. The precise etiopathogenesis of ectopic pregnancy (EP) is yet to be deciphered. Tubal implantation is hypothesised to occur due to a confluence of embryo arrest in the Fallopian tube and alterations in the tubal milieu that allow for early implantation. Recent studies have focussed on the etiologic role of molecular factors like lectin, integrin, matrix-degrading cumulus and its inhibitors prostaglandins, many growth factors, cytokines and their receptors, and modulator proteins.^{8,9} The majority of women (n=72) in our study group were between 21 and 29. Various studies in India have reported the highest incidence in the age bracket of 20–30 years. In a retrospective study conducted at Jhalawar Medical College to analyse the prevalence of ectopic pregnancy and the significance of known risk variables over three years, 72.5% of cases were noted in the same age group.¹⁰ In another hospital-based, retrospective cohort study of 5- year duration in Haryana analysed 175 EP and found the prevalence of 57.71% in the 20-30 years age cluster.¹¹ In another prospective study of 2 years duration from Nellore, of the 50 cases of EP, 74% were in the age group of 21-30 years. Most women in India marry and have children at a young age. This 20-30 years age group corresponds to the peak of sexual activity and reproduction, thus corroborating the age prevalence in studies from India.⁹ Another case-control study conducted between 1993 and 2000 in France also noted age as a risk factor, with the majority of women being in the same age group.¹² In contrast, in a study of the 132 patients in Eastern Havana, the majority of cases were noted in 25 to 34 years.¹³

In the present study, 56.2% were multiparous, and the rest were primiparous. In a study by Nath et al, the majority were multiparous (n=75), followed by nulliparous (34.28 %).¹¹ Similar finding was noted in a study evaluating risk factors for EP in a population of Cameroonian women.⁷ Prasanna et al also noted that 84% of women were multigravida and 16% were primigravidae.⁹ Comparable result was also noted by Panchal et al, Bhavana et al (80%), and Shetty et al.¹⁴ The greater prevalence in multigravida is most likely owing to past miscarriages and infections that caused tubal damage.⁹ In contrast, Wang et al found more nulliparous incidents in their study.^{10,17} They said that women who have given birth demonstrate that their fallopian

tubes are working normally, whereas nulliparous circumstances may be linked to faulty fallopian tube function, thereby having a greater risk of ectopic pregnancy.¹⁷

This study's most common risk factor was pelvic inflammatory disease (PID) at 25%, while 22.9% of women presented with no risk factor. Ectopic pregnancy risk factors are strongly connected to disorders that affect the usual method of fallopian tubal transport. It is thought that the more damage to the fallopian tube, the greater the chance of an ectopic pregnancy occurring.¹⁶ Tubal damage after pelvic infection, adnexal surgery history, and in vitro fertilisation have been significant risk factors. Previous ectopic pregnancy increases the likelihood of ectopic because it mirrors the underlying tubal disease, which is usually invariably bilateral.⁹ Congruent results were noted by Sanjay et al who found that 47.5% of cases had pelvic inflammatory disease, 22.5% had a history of being treated for infertility, and 10% had endured some tubal surgery, while 5% had a history of ectopic pregnancies.¹⁰ In contrast, Nath et al found miscarriage and previous history of ectopic pregnancy the most common factor.¹¹ In another study of 52 ectopic pregnancies, the most frequent associated risk factor before medical abortion (90%), followed by the history of lower segment caesarean, intrauterine device (IUD) (70%), curettage (57%), infertility (26%), ectopic pregnancy (19%), PID (15%) and tubal ligation in 12%.³ Consensus results were also noted in the study by Harish et al who noted no risk factors in 22% of cohorts. History of PID was the most common risk factor and was noted in 20% of women, followed by a history of tubal/abdominal surgery in 12%, infertility history in 10%, previous abortion in 10%, IUS/IUCD contraception in 8% and last ectopic pregnancy in 4%.¹ In a study of 31 cases of ectopic pregnancy the most prevalent risk factors was a history of abortion at 29%, followed by the history of tubal surgery, infertility and PID at 9.6%, 3.2% and 3.2% respectively.¹⁵ A case-control study in Lagos found no significant correlation between age, marital status, socioeconomic grade, and parity with EP. A late sexual debut was protective, while an early age initiation amplified the risk of EP two-fold. Multiple sexual partners, induced abortions, PID, sexually transmitted diseases, miscarriages, and pelvic surgery significantly raised the risk of EP. Prior use of IUD upped the risk by four-fold.¹⁸ The French study noted that prominent and significant risk factors were infectious history, previous PID and smoking. The other risk factors observed were age, history of spontaneous abortions, infertility, IUD, and medical induced abortion.¹² Wang et al denoted history of previous salpingotomy and abortion as major risk factors.¹⁶ Bhavana et al found similar risk factors of infertility (23.60%), PID (22.70%), earlier laparotomy (22.72%), tubal sterilisation (10%) with a history of ectopic pregnancy (10%).¹⁶

In agreement with the present study, various studies have also found lower economic status as a positive factor that significantly increases the risk of EP.^{1,9,16} Women with a low socioeconomic status have poor personal cleanliness and immunity, making them more susceptible to pelvic inflammatory disorders such as TB.⁹ Anrol et al found no correlation between the two parameters.¹⁸ Women with an ectopic pregnancy often report abdominal pain, vaginal bleeding, or both. Between 6- and 10-weeks' gestation, patients with an ectopic pregnancy typically experience these symptoms.^{8,19} It has also been documented that about 33% of women with ectopic pregnancies have no clinical signs.⁸ In a woman with a positive pregnancy test accompanied by syncope and shock indicators such as tachycardia, pallor, and collapse, a ruptured ectopic pregnancy should be suspected. Abdominal distension and tenderness are possible symptoms. The most common symptom recorded in the present study was abdominal pain (82.29%), followed by amenorrhea (73.95%). The results are as per with studies by Prasanna et al who noted pain abdomen in 90% and bleeding PV in 68%, Sanjay et al where the pain in the abdomen was noted in 87.5% and bleeding PV in 67.5%.^{9,10} Another study noted abdominal pain in 80.6% and abnormal vaginal bleeding in 61.3%. The similarity in symptoms was also noted in a study by Chaudhari et al who noted pain in the abdomen (90%), bleeding PV (80%), vomiting (73%), fainting (56%), shock (32%) and abdominal distention (24%).³ Another study of 175 EP revealed abdominal pain in 155 patients along with vaginal bleeding in 98 of them.¹¹ Surprisingly, unusual/atypical presentation is rather common as well. Appendicitis, salpingitis, ruptured corpus luteum or follicular cysts, threatened or inevitable spontaneous abortion, ovarian torsion, and urinary tract infection are all the other gynaecological problems and gastrointestinal or urinary tract diseases that may mimic ectopic pregnancy.⁸ Ectopic pregnancy is a life-threatening medical emergency that requires a keen eye for

detail. A comprehensive narrative of clinical history, signs and symptoms aided by appropriate diagnostic tools will help side-step fatalities. This study established EP was more common in the 20-29 years age group, with abdominal pain and vaginal bleeding being the most common symptom; and pelvic inflammatory disease being the most recognised sign amongst the subjects studied.

CONCLUSION:

Early diagnosis of ectopic pregnancy minimises morbidity and mortality and improves the quality of life. It is important to remember that only half of all women with ectopic pregnancies have recognisable risk factors. Therefore, it is crucial to remain vigilant in all women of childbearing age with amenorrhea, abdominal pain, vaginal bleeding, or previous episode of ectopic pregnancy. The importance of eliciting and recording a detailed clinical history cannot be understated.

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