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Original Research Article

Study of risk factors associated with ectopic pregnancy: an observational study

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ABSTRACT

Background: Any pregnancy in which the fertilised ovum implants outside the intrauterine 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. It is thus considered 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 this 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. 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 list of potential risk factors was compiled. The general, systemic, abdominal and vaginal 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 medical emergency which 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.

Keywords: Ectopic pregnancy, Pelvic inflammatory disease, Risk factors, Maternal mortality, Pregnancy

INTRODUCTION

Albucasis, an Arabian physician who lived in Spain in the 11th century, provided the first accurate account of extrauterine pregnancy. When studying the remains of a prisoner killed in Paris in 1693, Busiere discovered ectopic pregnancy for the first time. Healthcare has come a long way since then in recognising and managing ectopic pregnancy. Yet, it is the primary cause of maternal mortality during the first trimester, accounting for 10 to 15% of all maternal deaths.[1,2]

Any pregnancy in which the fertilised ovum implants outside the intrauterine cavity is an ectopic pregnancy. 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 raises 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 ACS Medical College and hospital from August 2015 to March 2017. The study included 60 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 trifecta 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 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). There were no patients in the above 40 years age group. Twenty-six were primipara, and the rest were multiparous. The majority of patients (55%) were of lower socioeconomic status. The demographics are depicted in Table 1.

Table 1: Demographics.

Parameters	Frequency	Percentage
Maternal age (in years)		
<20	8	13.3
20-24	21	35.0
25-29	18	30.0
30-34	12	20.0
35-39	1	1.7
>40	0	0.0
Parity		
Primipara	26	43.3
Multipara	34	56.7
Socioeconomic status		
Low	33	55.0
Middle	22	36.7
High	5	8.3

Symptoms

Symptoms include 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%).

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 2).

Table 2: Associated risk factors.

Associated factors	Frequency	Percentage
No. risk factors	11	18.3
Pelvic inflammatory disease	13	21.7
Previous tubal/abdominal surgery	8	13.3
Infertility	7	11.7
IUD	5	8.3
Both surgical and medical	3	5.0
Previous ectopic pregnancy	4	6.7
Curettage	5	8.3
Others	4	6.7

DISCUSSION

In the study group, 50 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=39) 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, 56.7% 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 representation 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 multigravidae and 16% were primigravidae.[9] Comparable result was also noted by Panchal et al, Bhavana et al (80%), and Shetty et al.[14-16] The greater prevalence in multigravidae 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 opined 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 21.7%, while 18.3% 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, intra-uterine 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 another 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 (88.3%), followed by bleeding per vaginum (PV) in 76.7 %. The results are on

par 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.

Limitations

A larger cohort size, with increased evaluative parameters like the site of ectopic pregnancy, educational background, occupation, number of sexual partners and history of smoking, would have contributed further to the knowledge base.

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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REFERENCES

1. Harish KM, Shwetha N, Nalini N. Incidence and risk factors associated with ectopic pregnancy: a prospective study. Int J Reprod Contracept Obstet Gynecol. 2021;10(2):703-6.
2. Li C, Zhao WH, Zhu Q, Cao SJ, Ping H, Xi X, Qin GJ, Yan MX, Zhang D, Qiu J, Zhang J. Risk factors for ectopic pregnancy: a multi-center case-control study. BMC Pregnancy Childbirth. 2015;15:187.
3. Chaudhari SC, Chaudhari SC. A study factors associated with ectopic pregnancy at tertiary health care center. MedPulse – Int J Gynaecol. 2017;4(1):4-6.
4. Andola S, Kumar RR, Desai RM, Krutika SA. Study of Risk factors and treatment modalities of ectopic pregnancy. J Family Med Prim Care. 2021;10:724-9.
5. Abdulkareem TA, Eidan SM. Ectopic Pregnancy: Diagnosis, Prevention and Management. Obstetrics. IntechOpen. 2017.
6. Ranji GG, Usha Rani G, Varshini S. Ectopic Pregnancy: Risk Factors, Clinical Presentation and Management. J Obstet Gynaecol India. 2018;68(6):487-92.
7. Assouni Mindjah YA, Essiben F, Foumane P, Dohbit JS, Mboudou ET. Risk factors for ectopic pregnancy in a population of Cameroonian women: A case-control study. PLoS One. 2018;13(12):e0207699.
8. Sivalingam VN, Duncan WC, Kirk E, Shephard LA, Horne AW. Diagnosis and management of ectopic pregnancy. J Fam Plann Reprod Health Care. 2011;37(4):231-40.
9. Prasanna B, Jhansi CB, Swathi K, Shaik MV. A study on risk factors and clinical presentation of ectopic pregnancy in women attending a tertiary care centre. IAIM. 2016;3(1):90-6.
10. Gupta R, Porwal S, Swarnkar M, Sharma N, Maheshwari P. Incidence, trends and risk factors for Ectopic Pregnancies in a tertiary care hospital of Rajasthan. J Pharm Biomed Sci. 2012;16(07):1-3.
11. Nath J, Mishra A, Verma V, Gupta S. A 5-year Study on Ectopic Pregnancy in North India. Sch Int J Obstet Gynec. 2021;4(3):49-54.
12. Bouyer J, Coste J, Shojaei T. Risk factors for ectopic pregnancy: a comprehensive analysis based on a large case-control, population-based study in France. Am J Epidemiol. 2003;157(3):185-94.
13. Ranji GG, Rani GU, Varshini S. Risk factors and clinical features of ectopic pregnancy. Rev Med Inst Mex Seguro Soc. 2017;55(3):278-85.
14. Panchal D, Vaishnav G, Solanki K. Study of Management in Patient with Ectopic Pregnancy. Nat J Integrated Res Med. 2011;2(3):91-4.
15. Shetty S, Shetty A. A clinical Study of Ectopic Pregnancies in a Tertiary care hospital of Mangalore, India. Innovative J Med Health Sci. 2014;4(1):305-9.
16. Bhavna, Gupta K.B, Pathania K, Jindal M, Vohra R, Ahmed M. Risk Factors For Ectopic Pregnancy: A Case Control Study In Tertiary Care Centre. J Dent Med Sci. 2014;13(3):23-7.
17. Wang X, Huang L, Yu Y, Xu S, Lai Y, Zeng W. Risk factors and clinical characteristics of recurrent ectopic pregnancy: A case-control study. J Obstet Gynaecol Res. 2020;46(7):1098-103.

18. Anorlu RI, Oluwole A, Abudu OO, Adebajo S. Risk factors for ectopic pregnancy in Lagos, Nigeria. Acta Obstet Gynecol Scand. 2005;84(2):184-8.
19. Ranchal S, Dunne C. Diagnosis and treatment of ectopic pregnancy. BMCJ. 2021;63(3):112-6.

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