

Analysis of Risk Factors Associated with Ectopic Pregnancy: A Cross-Sectional Study

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Abstract

Background and Aim: A ruptured ectopic pregnancy is a true medical emergency. It is the leading cause of maternal mortality in the first trimester and accounts for 10 to 15 percent of all maternal deaths. This study was conducted to provide more light on the risk factors associated with ectopic pregnancy.

Material and Methods: This prospective study was carried out at Department of Obstetrics & Gynecology, Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, for the duration of one and half year. The study included 100 women with a diagnosis of 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.

Results: The highest number of patients were noted in the 20-24 years age group (n=35) and the least in the 35-39 years age group (n=2). Symptoms include pain in the abdomen was the most commonly noted symptom at 88%, followed by bleeding per vaginum (76%), vomiting (73%), fainting (58%), shock (30.0%), and abdominal distention (22%). While 18 % of cohorts did not present with any risk factor, pelvic inflammatory disease (n=22) was the most commonly noted risk factor.

Conclusion: Early diagnosis of ectopic pregnancy minimizes morbidity and mortality and improves the quality of life. It is important to remember that only half of all women with ectopic pregnancies have recognizable 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.

Keywords: Ectopic pregnancy, Kutch, Pelvic Inflammatory Disease, Vaginal Bleeding

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Introduction

The earliest accurate description of an extra uterine pregnancy was that of Albucasis, an Arabian physician who lived in Spain in the

11th century. In his case, described by Kasper Bauhan in 1586, the foetal parts were discharged through the umbilicus following

the death of an abdominal pregnancy. This marked the 'Great Albucasis Evolution'. In 1693, Busiere first recognized ectopic pregnancy when he was examining the body of a prisoner executed in Paris [1]. Ectopic pregnancy is any pregnancy in which the fertilized ovum implants outside the intrauterine cavity. More than 95 percent of ectopic pregnancies occur in the fallopian tubes. Another 2.5 percent occur in the cornua of the uterus, and the remainders are found in the ovary, cervix or abdominal cavity [2]. Because none of these anatomic sites can accommodate placental attachment or a growing embryo, the potential for rupture and haemorrhage always exists. A ruptured ectopic pregnancy is a true medical emergency. It is the leading cause of maternal mortality in the first trimester and accounts for 10 to 15 percent of all maternal deaths [3].

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].

This study was conducted to provide more light on the risk factors associated with ectopic pregnancy.

Material and Methods

This prospective study was carried out at Department of Obstetrics & Gynecology, Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, for the duration of one and half year. The study included 100 women with a diagnosis of ectopic pregnancy. Ethical approval was taken from the institutional ethical committee and written informed consent was taken from all the participants.

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.

Statistical Analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

Results

A total of 100 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=35) and the least in the 35–39 years age group (n=2). There were no patients in the above 40 years age group. Forty four were primipara, and the rest were multiparous. The majority of patients (55%) were of lower socioeconomic status. The demographics are depicted in Table 1. Symptoms include pain in the abdomen was

the most commonly noted symptom at 88%, followed by bleeding per vaginum (76%), vomiting (73%), fainting (58%), shock (30.0%), and abdominal distention (22%).

While 18 % of cohorts did not present with any risk factor, pelvic inflammatory disease (n=22) was the most commonly noted risk factor (Table 2)

Table 1: Demographic data of study participants

Variables	Numbers	Percentage (%)
Maternal age (in years)		
<20	13	13
20-24	35	35
25-29	30	30
30-34	20	20
35-39	2	2
>40	0	0
Parity		
Primipara	44	44
Multipara	56	56
Socioeconomic status		
Low	55	55
Middle	36	36
High	9	9

Table 2: Associated factors in study population

Variables	Numbers	Percentage (%)
No. risk factors	18	18
Pelvic inflammatory disease	22	22
Previous tubal/abdominal surgery	13	13
Infertility	12	12
IUD	8	8
Both surgical and medical	5	5
Previous ectopic pregnancy	7	7
Curettage	8	8
Others	7	7

Discussion

The word "ectopic" means "out of place". An ectopic pregnancy occurs when a fertilized ovum implants outside the normal uterine cavity. The most common site for ectopic pregnancy adherence is in the ampullary region of the fallopian tube. The estimated

rate of ectopic pregnancy in the general population is 1 to 2% and 2 to 5% among patients who utilized assisted reproductive technology [7]. Centers for Disease Control (CDC) USA 1 have reported a 4-fold increase in its incidence from 1970 to 1983, 4.5 to

16.18 per 1000 pregnancies. In a multicentric case-control study in India, (ICMR Task Force Project, 1990) the incidence of ectopic pregnancy is 3.12 per 1000 pregnancies or 3.86 per 1000 live births.

In the study group, 100 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=65) 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]. The role of age in the incidence of ectopic pregnancy has been suggested by researchers. However, studies have produced conflicting results in this respect [11-15]. Thus, the precise physiological impact of advanced maternal age on ectopic pregnancy risk is unclear.⁷ It is highly improbable that an increase in chromosomal abnormalities in the trophoblastic tissue be caused by advanced maternal age [16,17]. It has been reported that the age-related changes in tubal function may delay ovum transport, leading to tubal implantation. However, these hypotheses remain to be tested. Furthermore, Coste et al., (1991) found that this association refers to the probability of exposure to most risk factors which increases with age [18]. Conversely, another study has suggested that age plays a more important role as compared to other risk factors [19].

In the present study, 56% 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 %) [20]. Similar representation was noted in a study evaluating risk factors for EP in a population of Cameroonian women [6]. 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 [21-23]. The greater prevalence in multigravidae is most likely owing to past miscarriages and infections that caused tubal damage.

This study's most common risk factor was pelvic inflammatory disease (PID) at 22%, while 18% 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.²³ Present study justifies Cates et al which state that in the general population, pelvic inflammatory disease is the most common risk factor for ectopic pregnancy [24-26]. Organisms that preferentially attack the fallopian tubes include *Neisseria gonorrhoeae*, *Chlamydia trachomatis* and mixed aerobes and anaerobes can produce tubal damage. Vaidya found PID as the commonest risk factor with an incidence of 25% in their study of 192 cases of ectopic pregnancy [27]. 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%.²⁸ 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%. 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 [5] Wang et al denoted history of previous salpingotomy and abortion as major risk factors [29].

Various studies have also found lower economic status as a positive factor that significantly increases the risk of EP [7,10,12]. Women with a low socioeconomic status have poor personal cleanliness and immunity, making them more susceptible to pelvic inflammatory disorders such as TB.9 Because of poor hygiene in low socioeconomic status patients, they are at higher risk of pelvic inflammatory disease. Anrol et al found no correlation between the two parameters [30].

The most common symptom recorded in the present study was abdominal pain (88%), followed by bleeding per vaginum (PV) in 76%. 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%) [28].

Similar to our findings, other studies also found an increased risk of 7-9-fold among women with a history of prior ectopic pregnancy [31]. Karaer et al. also found a strong relation between previous ectopic pregnancy and ectopic pregnancy. They concluded that a woman with a damaged

fallopian tube or another intrinsic factor leading to a previous ectopic pregnancy has a greater tendency toward a subsequent ectopic pregnancy [32].

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. In addition, ectopic pregnancy was positively related to the previous history of ectopic pregnancy, abortion, caesarean section, and infertility. These findings can be useful for early diagnosis of ectopic pregnancy to pursue proper medical therapy instead of unnecessarily surgical treatment. Advancing maternal age and low socioeconomic status are risk factor for ectopic pregnancy possibly due to increased chances of exposure to STDs and PID.

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