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Original Research Article

Management of ectopic pregnancies in a tertiary centre

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ABSTRACT

Background: Ectopic pregnancies (EP) have become more common among young women in recent years. The incidence of EP has raised from 1.5-2% to 20.7 per 1000 pregnancies. As a result of early detection and treatment, the incidence of ruptured EP, maternal mortality, and morbidity has decreased. The purpose of this study is to examine all cases of EP in order to determine the incidence, as well as to investigate the risk factors, presentation, complications and management of EP.
Methods: This is a retrospective cohort study conducted at Kasturba medical college in Manipal, India. All EP data from 2014 to 2019 was obtained from medical records. EP incidence, risk factors, mortality, and morbidity were the primary outcome measures. IBM.SPSS software version 23.0 was used to collect statistical data.
Results: Over a five-year period, 436 EP were identified, with a 33/1000 pregnancy rate. The majority of women 243 (55.7%) were between the ages of 21 and 30. The most common risk factor was pelvic surgery (39.20%). 184 (42.2%) of the participants had classic EP symptoms, while 60 (13.76%) were asymptomatic. The 325 (74.5%) EP required surgical intervention. Methotrexate was used to treat 83 women (19.03%), 16 of whom were unsuccessful. The 86 (19.49%) women required blood transfusion. There were no reported deaths.
Conclusions: Assessing risk factors and diagnosing with TVS, serum hCG assays, and timely intervention can help in reducing the morbidity and mortality due to EP.

Keywords: EP, Risk factors for EP, Rising trends in ectopic, IVF and EP

INTRODUCTION

An ectopic pregnancy (EP) occurs when a fertilized ovum implants outside the normal uterine cavity. It is a life-threatening emergency in early pregnancy and the most important cause of maternal mortality and morbidity in the first trimester. Now in current practice, there is an increasing trend in the EP due to the increase in the number of pregnancies due to IVF procedures.

Other risks involved in the development of EP like previous EP, pelvic inflammatory disease (PID), smoking, prior abortions, tubal sterilization, intrauterine devices, tubal corrective surgery, documented tubal pathology, and prior delivery have been implicated in the development of the EP. Knowledge of the associated risk factors helps identify women at higher risk to facilitate early and more accurate diagnosis.

Diagnosis requires a high index of suspicion as the classic triad of amenorrhoea, abdominal pain, and vaginal bleeding which is not seen in the majority of cases. The contribution of EP to the maternal mortality rates in developing countries including India is not precisely known, with data from few studies indicating 3.5-7.1% maternal deaths due to EP.[1,2]

Early diagnosis reduces the risk of tubal rupture and allows more conservative medical treatments to be employed.

The purpose of this study was to appraise all the cases of EP managed at a tertiary care centre over 5 years and, to

determine the incidence, risk factors, clinical presentation, management and morbidity associated with EP.

METHODS

The study is a retrospective study was conducted at Kasturba medical college, Manipal in south India. The study was approved by the institute ethics committee. The case records of patients diagnosed with EP between August 2014 and July 2019 were retrieved from the medical records department. Patient characteristics like age, parity and risk factors for EP were noted. Management modality, complications and need for blood transfusion were also recorded. The primary outcome measures studied were incidence of EP, their risk factors, mortality and morbidity in these women.

Data was entered in MS excel spreadsheet and analysed using IBM. SPSS software version 23.0. For categorical variables, data was compiled as frequency and per cent. For continuous variables, data calculated as mean ± SD.

RESULTS

Over the five years, 12,990 pregnancies were diagnosed, out of which 436 pregnancies were extra-uterine. The incidence of EP was 3.3% or 33.5/1000 pregnancies. Majority of the women were aged 21-30 years (Table 1).

Table 1: Age of study population, (n=436).

Age (years)	Number	Percentages (%)
<20	8	1.8
21-30	243	55.7
31-40	181	41.5
41-50	3	0.7
>50	1	0.2

In the present study, 67.67% were multigravida and 32.33% were primigravida (Table 2).

Table 2: Gravidity.

Variables	Number	Percentages (%)
Primi	141	32.33
2nd	136	31.20
3rd	109	25
>3	50	11.47

Clinical presentation

In the present study, acute abdominal pain was the most common complaint, seen in 311 (71.3%) women, although a history of preceding amenorrhoea was present in 408 (93.5%) women. H/O Bleeding per vaginum in 56.8%, and asymptomatic in 13.7%. The classic triad of amenorrhoea, vaginal bleeding and lower abdominal pain was present in 184 (42.2%) cases. The other symptoms at presentation were vomiting and syncope.

A spot urine pregnancy test was performed in all cases and was found to be positive in 100% case. The mean gestational age at diagnosis was 6.5 weeks. The site of ectopic was fallopian tubes in 415 cases (95.1%). USG revealed ruptured EP in 38.07% of cases, unruptured in 58.71% of cases, heterogeneous mass with minimal free fluid n POD in 1.60% of cases.

Table 3: Symptoms.

Symptoms	Number	Percentages (%)
Amenorrhoea	408	93.5
Abdominal pain	311	71.3
Vaginal bleeding	248	56.8
Asymptomatic	60	13.7

Table 4: Signs.

Signs	Number	Percentages (%)
Abdominal tenderness	225	51.6
Hemodynamic shock	38	8.7

The most common risk factors were pelvic surgery (39.2%). Among the women who underwent pelvic surgery, 28 women had undergone tubectomy and 4 women had a tubal recanalization surgery, 12.3% had H/O pelvic infection 15.1 % had H/O infertility, 8.7% had H/O previous ectopic, H/O IUCD in 2.5% (Table 5).

Table 5: Risk factors.

Risk factors	Number	Percentages (%)
History of pelvic surgery	171	39.2
History of infertility and treatment for same	66	15.1
History of PID	54	12.3
History of EP	38	8.7
History of induced abortion(s)	29	6.6
History of intrauterine contraceptive device	11	2.5

Table 6: Site of ectopic.

Site of ectopic	Number	Percentages (%)
Ampulla	204	46.7
Isthmus	30	6.9
Cornual	20	4.5
Fimbria	12	2.7
Ovarian	3	0.7
Cervical	1	0.2
Caesarean scar	17	3.9

In 95.18% of cases, EP was tubal, and it was more common on the right side (55.2%). A majority of the cases were ampullary pregnancies (49.15%), 7.2% were isthmic, cornual pregnancies were seen in 4.8% and while 2.9% were in the fimbria, 17 (3.9%) scar ectopic, 3 ovarian and 1 cervical EP were seen (Table 6).

Haemodynamically stable patients with serum beta HCG levels less than 2000U/ml have received expectant management. The 44 (10%) women have received expectant management. Stable patients who had a gestational sac size measuring less than 4 cm by transvaginal ultrasonography, serum beta HCG (human chorionic gonadotropin) levels less than 10,000 U/ml and no free fluid in the pelvic cavity were managed medically. The ability for regular follow-up was ensured before medical treatment. The 83 (19.03%) women were managed medically with methotrexate. Seventy-six of them had a single dose of methotrexate, while seven needed a multiple-dose regimen. Sixteen of the 83 women required surgery following failed medical management. Among the 325 (74.5%) women managed surgically, 166 were ruptured at the time of diagnosis, with hemoperitoneum has seen intraoperatively. Among ruptured EP, more than half of the women needed blood transfusion (51.8%). No deaths were noted.

The most common procedure done was unilateral salpingectomy 86.15%, bilateral salpingectomy in 35 (10.7%) followed by cornual resection (1.5%), salpingo-oophorectomy (0.6%), salpingotomy (0.3%) laparoscopic surgery was performed in 66.1% of women who underwent surgical management. Three women with scar ectopic underwent uterine artery embolization.

DISCUSSION

The incidence of EP has increased in the last 20 years. EP accounts for 3.5-7.1% of maternal mortality in India.[1,2] The incidence of EP was 3.3% in our study, similar to the study done by Mehta et al (3%).[3] It is a significant cause of mortality in the first trimester. To reduce mortality and morbidity, timely referral to a higher centre is the imperative.

Majority of the woman (55.7%) in our study group belonged to the age group of 20-30 years. This may be because this period is the maximum fertile period, and the use of contraception is infrequent and occasional. In a study done by Panchal et al EP was more common in the age group between 20-30 years (71.66%).[4] Gaddagi et al (70.2%) most of the women in India marry at an early age and completes their family at an early age.[5]

In the present study group, the majority of women with EP were multigravida (67.6%). The higher incidence in multigravida is probably due to previous miscarriages and infection resulting in tubal damage. This correlates with the studies done by Panchal et al (81.66%), Poonam et al, (83.6) and Shraddha Shetty et al (83.9%).[4,6,7]

The classical triad of abdominal pain, amenorrhea and vaginal bleeding were seen in 42.2% of our cases. Other studies have reported this triad to be present in 28-95% women clearly indicating that this is not a presenting feature in most cases.[8-10] History of amenorrhea was present in 93.5% of our cases. Singh et al reported that 52% of their cases did not have preceding amenorrhea.[8]

Mean gestational age at diagnosis of EP was 6.5 weeks in our study, while Khaleeque et al reported 6 weeks at diagnosis.[11] Women may be unaware of ongoing pregnancy and hence may not anticipate a pregnancy complication. Such women are most often seen first at a primary health centre or by a general practitioner and hence, the importance of careful history-taking cannot be overemphasised.

In our study, history revealed the presence of at least one risk factor in 66.7% of the women, similar to other studies.[8,11] Among the risk factors, previous pelvic surgery was the most common (39.2%), followed by the history of infertility and treatment (15.1%) in our study and then PID (12.3%). The reason for previous pelvic surgery being the most common risk factor in our study could be attributed to the high caesarean section (31.9%) and tubal sterilisation (57.4%) rates in our state.[12] Among the previous pelvic surgeries 28 (16.3%) women had undergone tubectomy and 4 (2.3%) women had a tubal recanalization surgery. Hence a pregnancy test must be performed in all cases irrespective of their sterilisation status. 6.57% of the women with EP had tubal sterilization in the study done by Sudha et al.[13] Incidence is high maybe because concomitant sterilization with LSCS and postnatal sterilization are the common procedures. In the postpartum period, oedematous, congested and friable tube increases the chance of incomplete tubal occlusion resulting in ectopic implantation.

In our study group, 15.1% of the women with EP have either h/o infertility and underwent treatment for the same which is almost similar to the study done by Panchal et al (11.66%).[4] The association between infertility, previous pelvic infection and tubal pathology is the possible explanation. The incidence of EP after assisted reproductive techniques is 4%.[14,15]

The 8.7% of the women in our study had a history of previous EP which is correlating with the studies done by V. S. Sudha et al Thangaraj (8.33%), Mulfti et al (5.26%), Shabab et al (5%).[13,16,17] There is an increased risk of ectopic with previous EP because it reflects the underlying tubal pathology which is almost always bilateral. Although there is further tubal damage following tubal surgery.

History of PID was seen in 12.3% of our patients, similar to that reported by Singh et al, Sudha et al and Tahmina et al in their studies.[8,13,18]

The urinary pregnancy test, serum ß HCG and transvaginal ultrasound were used for the diagnosis of EP. Studies have

shown that ultrasonography should be the initial investigation for symptomatic women in their first trimester; when the results are indeterminate, the serum human chorionic gonadotropin concentration should be measured.[19]

Most of the cases (74.5%) were managed surgically and salpingectomy was performed. Most studies reported a similarly high rate of surgical management.[7,11,20] In contrast, surveys from the United Kingdom by Taheri et al and van den Berg et al reported a falling trend in the number of cases managed surgically (98% to 62% and 50% to 27% respectively), over the last two decades.[21,22] This was attributed to the establishment of early pregnancy assessment units (EPAU) where EP is likely to be diagnosed at an early stage when medical management is still plausible. Laparoscopy and medical management have now emerged as the widely used therapeutic modalities with great success in terms of reduced morbidity, shorter hospital stay and conservation of fertility.[23]

The fallopian tubes were the most common site of EP (95.1%). Most studies reported a higher incidence of EP in the right tube which is similar to our study.[8,4,25] In developing countries, the majority of patients are diagnosed after tubal rupture. Our centre being a tertiary level referral centre, 38.07% of the women had ruptured EP and presented with a hemoperitoneum, while some studies have reported 70-100% of EP which were ruptured at diagnosis, mostly due to late referrals. Eighty-six (19.7%) women needed a blood transfusion, which was lesser compared to the other studies.[7,11,20,24] Unique et al reported a 94.4% need for blood transfusion, as all women presented with a ruptured EP and underwent a laparotomy and salpingectomy.

There were no deaths due to EP during the period of our study. Maternal mortality due to EP was reported to be between 0% and 1.3% in various studies.[7,11,20] Though the incidence of EP has drastically increased, maternal mortality has decreased due to early diagnosis. Mortality is mostly due to haemorrhage following rupture of the EP due to delayed referrals and diagnosis. The 60% of women with a history of ectopic will have successful intrauterine pregnancy.[26] In optimally selected candidate Methotrexate has an overall success rate of nearly 90%.[27]

Prevention and treatment of PID and encouraging women to undergo early transvaginal ultrasonography to confirm the location of pregnancy is likely to prevent late diagnosis. This will also allow medical management or fertility-sparing conservative surgical management.

Ultrasonography being the mainstay for evaluating EP, its availability at the point of care will also help the majority of patients by allowing safe and timely discharge of patients presenting to emergency departments with clinical suspicion of an EP.[28]

Horne et al suggested the use of serum placental growth factor (PGF) to differentiate between intrauterine and EP and concluded that serum PIGF was undetectable in women with tubal EP and reduced, or undetectable, in miscarriage compared to viable intrauterine pregnancies.[29] Cabar et al attempted to correlate the levels of serum vascular endothelial growth factor (VEGF) and ultrasonographic features in EP and concluded that serum VEGF was raised in EP with cardiac activity.[30] Future studies are required to assess the clinical utility of these markers.

Limitation

Our study is limited by its retrospective nature. Further, we were unable to estimate the duration of delay in diagnosis and referral and its effect on morbidity.

CONCLUSION

With high clinical suspicion serum ß hCG and TVS, early diagnosis is possible. The 61.9% were detected in the unruptured state. Early diagnosis and effective medical management decrease the surgical burden. Recent conservative management options of EP are the use of medical management and laparoscopy. Availability of facilities for laparoscopic surgery in an emergency helps reduce laparotomy and associated morbidity. Increased clinical suspicion, early diagnosis and timely management have resulted in zero mortality rates.

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