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Original Research Article

A retrospective analysis of ectopic pregnancies in tertiary care hospital of Western India: two year study

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ABSTRACT

Background: Ectopic pregnancy (EP) is the leading cause of maternal morbidity and mortality in the first trimester and major cause of reduced reproductive potential. Early detection of EP by improved ultrasonography modalities has decreased the rate of rupture and consequent maternal morbidity. Aim was to study the predisposing risk factors in modern scenario and choose the appropriate management available.

Methods: A retrospective study on clinical diagnosis and management of EP of patients was carried out between January 2018 to February 2020. Investigations included CBC, UPT, serum β -hCG and TVS. Management was decided after thorough evaluation.

Results: Out of 7,780 deliveries, 70 were EP (0.9%). Women with age 21-30 year had highest incidence (85.7%). Common symptoms were abdominal pain (94%), amenorrhea (87%), bleeding per vagina (48%). Most common risk factor associated with EP was PID (28.5%). Tubal EP was most common (84.2%) involving ampulla (66%), isthmus (15%), fimbria (12%), interstitial (7%). Scar ectopic was reported in 10% of cases and ovarian, rudimentary horn and abdominal pregnancy in 1.4% each. About 52.8% of ectopic was ruptured and salpingectomy was done in 74.3% and salpingo-oophorectomy in 2.8%. Five cases of scar EP required hysterotomy and 1 case was managed by methotrexate (MTX).

Conclusions: EP remains a major challenge to the obstetrician worldwide. A high index of suspicion is required for early diagnosis and timely intervention in the form of medical or surgical treatment will definitely help in reducing the morbidity and mortality.

Keywords: Bleeding per vagina, Ectopic pregnancy, Pelvic inflammatory disease, Urine pregnancy test

INTRODUCTION

Ectopic Pregnancy (EP) is an unmitigated disaster of human reproduction. The disparity of its signs and symptoms makes it a real challenge and interesting puzzle for the obstetricians for timely diagnosis and intervention.

The blastocyst formed subsequent to fertilization normally implants in the endometrial lining of the uterine cavity. Implantation elsewhere is considered ectopic

gestation which accounts for 0.5% to 1.5% of all first trimester pregnancy in United States.¹ EP remains leading cause of maternal death in early pregnancy and has its adverse impact on women's fertility.² Risk factors implicated in the development of the EP includes pelvic inflammatory disease (PID), tubal surgeries, tubal sterilization, intrauterine devices, assisted reproductive techniques (ART), documented tubal pathology, previous EP, smoking, multiple sexual partners, prior abortions, sexually transmitted disease (STD) and prior delivery.³ In the last decade a declining trend is seen in the incidence

of ruptured EP. This decline is due to improvement in the diagnostic techniques including transvaginal ultrasonography (TVS) and more sensitive and specific human chorionic gonadotrophin (β -hCG) assays.⁴

This retrospective analytical study was done to determine the incidence, clinical presentation, risk factors, management, morbidity and mortality associated with EP in a tertiary care hospital.

METHODS

This retrospective study is based on clinical diagnosis and management of ectopic pregnancy of 70 women who reported to department of obstetrics and gynecology at tertiary care center from January 2018 to February 2020.

Inclusion criteria

- All cases with history suggestive of ectopic pregnancy and was confirmed by clinical findings, ultrasound and direct visualization at laparotomy are included in the study.

Data was collected in a preconceived format from the case files of patients with EP which were traced through labor ward and operation theatre registers. Information regarding total number of deliveries during study period, demographic parameters, presenting clinical symptoms and signs, parity, diagnostic methods used, detailed obstetric history, various risk factors, ectopic site, genital infections, treatment algorithm as well as morbidity and complications were obtained. Relevant investigations included complete blood count, blood group, urine pregnancy test (UPT), serum β -hCG assay and TVS. Line of management was decided after thorough evaluation. Data was collected, analyzed and tabulated.

RESULTS

During the study period there have been 7,780 deliveries in study hospital, of which 70 cases (0.9%) were diagnosed as ectopic pregnancy (1 in 112 deliveries or 9 in 1000 deliveries). Urine pregnancy test (UPT) was carried out in all cases for provisional diagnosis and confirmed by TVS. A majority of cases belonged to the gestational age of 6-9 weeks, while the range was between 4 and 16 weeks.

The majority of cases were between the age of 21-30 years (85.7%) and the mean age for this study was 24.9 years. The maximum incidence of EP was observed in nulliparous (42.8%) followed by primipara (30%) (Table 1).

In present study, the most common risk factors associated with EP was PID (28.8%) followed by h/o previous abortion (14%), ovulation induction (5.7%), tubal surgeries (4.2%), previous ectopic (4.2%), IUD (4.2%).

Thirty percent cases had no risk factors, while only 2.8% cases were of age group >35 years (Table 2).

Table 1: Demographic parameters.

Age group (years)	Number of cases N (%)	Parity	Number of cases N (%)
≤20	4 (5.7%)	0	30 (42.8%)
21-25	35 (50%)	1	21 (30%)
26-30	24 (35.7%)	2	11 (15.7%)
31-35	5 (7.1%)	3	7 (10%)
>35	2 (2.8%)	≥4	1 (1.4%)

Table 2: Distribution of cases according to risk factors related ectopic pregnancy.

Risk factor	Number of cases N (%)
Age > 35 years	2 (2.8%)
PID	20 (28.5%)
Previous abortion	14 (20%)
Ovulation induction	4 (5.7%)
Tubal surgery/tubal ligation	3 (4.2%)
Previous ectopic	3 (4.2%)
Intrauterine device (IUD)	3 (4.2%)
Unexplained	21 (30%)

Among 70 patients with EP, 66 cases (94%) had abdominal pain and tenderness, 61 cases (87%) presented with amenorrhoea and 34 cases (48%) had h/o bleeding per vagina. The classical triad (abdominal pain, amenorrhoea and bleeding per vagina) was observed with 48% of cases. Adnexal mass was felt in 24% of cases and in 77% cervical motion tenderness was elicited. Only 7% cases presented with shock.

Table 3: Distribution of cases according to site of ectopic pregnancy.

Site of EP	Number of cases N (%)		
Tubal	Right sided	59 (84.2%)	33
	Left sided		26
Ovarian	2 (2.8%)		
Rudimentary horn	1 (1.4%)		
Abdominal	1 (1.4%)		
Scar ectopic	7 (10%)		

Fallopian tube was the most common site of EP and was reported in 84.2% cases. Extra tubal site, i.e., ovarian ectopic (2.8%), rudimentary horn (1.4%), abdominal (1.4%) and scar ectopic (10%) were also observed (Table 3).

Ruptured tubal ectopic in 37 cases (52.8%), unruptured tubal ectopic in 32 cases (45.7%) and tubal abortion was noted in 1 case (1.4%). Among tubal EP, the most common site was ampulla (66%) followed by fimbrial (12%), isthmus (15%), interstitial (7%) (Figure 1).

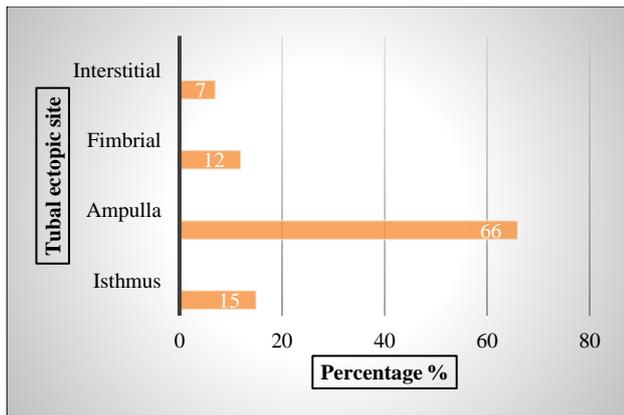


Figure 1: Site distribution of tubal ectopic.

The most common surgery performed was salpingectomy (74.3%) followed by salpingo-oophorectomy which was done in 2.8% cases (in 1 case of ovarian EP). Laparoscopic approach was preferred in 10% of cases while 64.3% cases were operated by laparotomy. Hysterotomy was performed in 5 cases of scar ectopic and 1 case of scar ectopic required obstetric hysterectomy. Rudimentary horn excision was done in 1 case of ruptured EP in bicornuate uterus. One case abdominal pregnancy (gestational age-26 weeks) was diagnosed per-operatively and was successfully managed by removal of fetus and placenta.

Medical management by inj. methotrexate (Mtx) was the chosen modality of treatment in 10% cases and only 1 case was given expectant management. Morbidity associated with EP included blood transfusion (≥ 1 units) in 32.8% cases, febrile episodes in 2.8% and abdominal distension in 1.4%. Methotrexate toxicity was observed as bone marrow suppression (1.4%). No mortality and acute renal failure were found in this study among 70 patients which shows that early diagnosis and treatment can prevent severe morbidity and mortality in ruptured EP.

DISCUSSION

In present study, 9 cases of ectopic pregnancies were reported for every 1000 deliveries (incidence 0.9% or 1 in 112 deliveries) which is consistent with the study by Stulberg et al.¹ According to Taran FA et al, ectopic pregnancy is a complication in 1.3-2.4% of all pregnancies.⁵ Maximum incidence was observed in the gestational age of 6-9 weeks which shows similarity with study by Khaleeque et al.⁶

There were 85.7% cases in the age group of 21-30 years which is in contrast to the study by Bouyer et al (42.8%).⁷ This disparity is implicated to the fact that majority of women in India marry at an early age and completes their family.⁸ In present study, average age of patients was 24.9 years. This age corresponds with peak sexual activity and reproduction.⁸ Thirty (42.8%) patients were nullipara and

21 cases (30%) were primipara in present study which correlates with Bouyer et al, (nullipara 39.5% and primipara 35.6%).⁷

Literature and various studies suggest previous EP and tubal surgery to be the strongest risk factors related with the occurrence of EP.⁹ In present study, previous EP observed in 4.2% with similar results in study carried by Yakasai et al (4.95%) which is in correlation with the hypothesis that women with previous EP has greater tendency toward a subsequent EP.¹⁰ Bouyer et al, reported prior tubal surgeries in 23.7% cases which is very high in incidence from 4.2% in present study.⁷ This contrast is due to variation in sample size. History of PID was seen in 28.5% of cases in present study, similar to that published by Cheng Li et al.¹¹ (33.3%) suggesting strong evidence that PID is strongly responsible for the extrauterine implantation. Chlamydia trachomatis has been implicated as a risk factor for EP, with the risk increasing with each successive infection; ascending infection and resultant salpingitis is thought to lead to tubal dysfunction and aberrant implantation.¹² H/o ovulation induction was seen in 5.7% which is on lower side to study by Bouyer et al (10%).⁷ H/o previous abortion is reported in 20% cases with similarity to Bouyer et al (17.8%).⁷ Intrauterine device (IUD) as a method of contraception was used by 4.2% cases in present study.

The most common presenting symptom was pain in lower abdomen which was complained by 94% cases followed by history of amenorrhea (87%), which were also reflected by Wakankar et al, (pain=86.53%, amenorrhea=80.6%).¹³ The classical triad of abdominal pain, vaginal bleeding and amenorrhea were present in 48% cases. Study by Tahmina et al, reported triad in 40.3% cases.¹⁴ This indicates that triad is not the presenting feature in more than 50% cases. In present study, 5 cases (7%) presented to the hospital in shock. On clinical examination, the most common physical sign observed was abdominal tenderness (94%) which is on higher side in comparison with Tahmina et al (75%).¹⁴ Cervical motion tenderness was elicited in 77% cases while Tahmina et al, reported it in 58.3% cases.¹⁴

The literature shows 97% of extrauterine pregnancy occurs in fallopian tubes and most common site is reported to be ampullary followed by isthmus of fallopian tube. Around 2-3% occurs as interstitial ectopic pregnancies. The less common sites are fimbrial, cervical, ovarian, as well as previous scars. The present study depicts similar results.^{10,11} EP is tubal in 84.2% cases, which is comparable with the studies by Yakasai et al (89.11%) and Tahmina et al (95.8%).^{10,14} Most of the cases reported ampullary ectopic (66%) which is consistent with Bouyer et al (60%).⁷ Second most common site of tubal pregnancy was isthmus (15%) and is similar to Khaleeque et al (15.4%).⁶ Right sided ectopic (56%) was more common than left in present study which is comparable to studies by Khaleeque et al (60%).⁶ Two

cases (2.8%) was with ovarian EP comparable to the study by Sümeýra et al (1.5%).¹⁵ Incidence of interstitial pregnancy was 5.7%, while Khaleeqe et al, reported it in 10.3% cases.⁶ In present study, 7 cases of scar EP are reported (incidence 1 in 1112 deliveries) which is higher than the study described by Seow et al (1 in 1800 to 1 in 2500 deliveries).¹⁶ This disparity is due the increasing rate of cesarean deliveries worldwide.

In the present study only 1 (1.4%) case had tubal abortion and ruptured rudimentary horn pregnancy respectively. The present study reported rupture of rudimentary horn at 16 weeks of gestation. The unnoticed rudimentary horn pregnancy inevitably ruptures. 80% to 90% of the cases of rudimentary horn pregnancy ultimately ruptures between the 10th and 20th weeks of pregnancy.¹⁷ Thirty-two cases (45.7%) were unruptured while 37 cases (52.8%) were ruptured EP.

In the present study, salpingectomy (laparoscopy or laparotomy) was performed in 74.3% cases which is similar to that found in a study carried out by Sümeýra et al (74.4%).¹⁵ The rate of laparotomy (85%) was higher than the laparoscopy (15%) which is in consistent with Sümeýra et al.¹⁵ Obstetric hysterectomy was performed in 1 case of CSP following dilatation and evacuation due to uncontrolled and torrential haemorrhage. There have been many reasons for the increased rate of laparotomy in comparison to laparoscopy in the present research. First of all, the laparoscopic surgical approach was the preferred method for hemodynamically stable patients. The surgeon's own skills, of course, seemed to have an importance in the selection of surgical method. Lastly, similar to the literature, it was very difficult to perform laparoscopy when the body mass index of the woman was >30 kg/m² and in patients having previous abdominal surgery, heavy hemoperitoneum, or cornual pregnancy.¹⁸ Nowadays, almost all types of ectopic pregnancies - tubal, ovarian, rudimentary horn pregnancy, CSP can be managed well with laparoscopy, if established endoscopic set up, trained staff and skilled endoscopic surgeon available. Salpingo-oophorectomy was done in 2.8% cases (ruptured ovarian ectopic) in present study which correlated to Sümeýra et al (4.6%).¹⁵

One case abdominal pregnancy (gestational age-26 weeks) was diagnosed per-operatively and was successfully managed by removal of fetus and placenta, which was implanted over posterior aspect of right sided broad ligament and was separated successfully. Management of placenta in abdominal pregnancy remains a controversial issue. Most clinicians believe the best treatment is to clamp the cord, to leave the placenta in situ if it is implanted over vital organs and close the abdomen. The placenta can be removed after complete cessation of function that is demonstrated by serial β -hCG titers.¹⁹

In present study 1 case (1.4%) is treated by expectant management till serial β -hCG came into non pregnant

range. Medical line of the management with injection MTX was given in 7 (6 tubal and 1 CSP) cases (10%) which were clinically stable and mass of ectopic gestation <4 cm and success rate of 77.8% was reported. A study by Sümeýra et al, chose the medical management in 49.2% cases and reported success rate of 70%.¹⁵ These patients were treated with single and multidose regimen of Mtx therapy along with serial β -hCG monitoring. In 4 cases multidose Mtx regimen was used and 2 cases were managed by single dose Mtx. Two cases were initially managed by MTX but later on laparotomy was performed due to rupture of ectopic mass in 1 case and increasing titer of β -hCG in another. One case of CSP was selected for medical management with multi dose MTX. Timor et al recommended medical management in CSP in less than 8 weeks gestation.²⁰

Morbidity included anemia, blood transfusion, febrile episodes and bone marrow suppression. Altered renal function test and severe bone marrow suppression was reported toxicity after 2nd dose of Mtx in woman with CSP. This was managed with Inj. Leucovorin and Granulocyte - Colony stimulating factor (G-CSF). By reducing and identifying the risk factors and catching the patients at the earliest, it is possible to improve the prognosis so far as morbidity, mortality, and fertility are concerned.²¹

The EP mortality ratio ranges from 0.48 deaths per 100 000 live births to 0.50 per 100 000 live births reported from US vital statistics.²² Fortunately, no maternal mortality have been reported in present study.

CONCLUSION

Ectopic pregnancy remains a gynaecological catastrophe and a major challenge to the reproductive function of women worldwide. With its rising incidence, which is likely to continue because of the various factors discussed, it is necessary to devise means of early detection and treatment. A high index of suspicion and creating awareness is required for its early diagnosis. Early identification of underlying risk factors, diagnosis with the essential aids like TVS and β -hCG and timely intervention in the form of medical or surgical treatment will definitely help in reducing the morbidity and mortality associated with EP and improve the future reproductive outcome. Health education on safer sex and provision of family-planning services, such as condoms and other barrier contraceptives, will help prevent sexually transmitted infection and unwanted pregnancies, thereby reducing the incidence of pelvic infection and post-abortal complications.

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