

Prospective Observational Assessment of Ectopic Pregnancy Incidence, Risk Factors, Clinical Characteristics, Diagnosis, Management and Outcome

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Abstract

Aim: The present study aims at determining the incidence, risk factors, clinical features, diagnosis, management and outcome of ectopic pregnancies.

Methods: This prospective observational study was carried out in the Department of Obstetrics and Gynecology, Lady Harding Medical College, Delhi, India, for 15 months. Total 100 cases were diagnosed with ectopic pregnancy.

Results: During the study period, 39000 deliveries and 100 ectopic pregnancies. Therefore, the incidence of ectopic pregnancy (0.024%) or 2.4 per 1000 deliveries. The most common site of ectopic pregnancy was fallopian tube 88(88%). Ampulla was the commonest site 67(67%) for ectopic implantation in the fallopian tube. Heterotopic pregnancy is rare where pregnancy is seen in the uterus and tube at the same time. In our study, there were 3(3%) cases of heterotopic pregnancies. The most common risk factor was pelvic inflammatory disease 44(44%) followed by H/o previous abortion 20(20%) and H/o previous abdominopelvic surgery including tubal ligation, LSCS and appendectomy 23(23%). Although any form of contraception decreases the overall risk of pregnancy including ectopic Pregnancy, when contraceptive failure occurs in women using an IUCD or following tubal sterilization, risk of Ectopic Pregnancy is elevated. In our study, 13(13 %) patients were using copper IUCD. H/o infertility due to tubal block or other causes, treatment associated with infertility, endometriosis and H/o previous ectopic pregnancy were other identified risk factors.

Conclusion: The incidence of ectopic pregnancy is on the rise. The incidence of ruptured ectopic pregnancy is high in developing countries due to late diagnosis and delayed referral. In developing countries, PID and postabortal sepsis continue to be the most important risk factor for ectopic pregnancy.

Keywords: Ectopic pregnancy, Pelvic inflammatory disease, Risk factors, Salpingectomy, Tubal pregnancy

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Introduction

An ectopic pregnancy is one in which the fertilized ovum is implanted and develops outside the normal endometrial cavity.[1] It complicates 1% of all pregnancies and is one of the leading causes of the maternal morbidity and mortality especially in low income countries.[2,3]

The most common EP location is in the fallopian tube, predominantly the ampullary region of the fallopian tube. Implantation outside the fallopian tube—in the cervix, ovary, myometrium, abdominal cavity, interstitial (i.e., intramuscular/proximal) portion of the fallopian tube or coincidentally with an intrauterine pregnancy—occurs in less than 10 % of EPs. Heterotopic pregnancy (HP) refers to the coexistence of an intrauterine pregnancy with an EP in any of these locations. ‘Cornual’ pregnancies are those implanted in a horn of an anomalous uterus (i.e., unicornuate, bicornuate, didelphys or septate uteri); these do not uniformly require intervention and will not be included in this review.[4] In the developing world, the incidence is much higher and 1 in 10 women admitted with a diagnosis of tubal ectopic pregnancy ultimately die from the condition.[5] In the developing countries, ectopic pregnancy is possibly the second most common cause of maternal death next to postabortal complications in the first three months of pregnancy.[6] Although, overall incidence of ectopic pregnancy has increased over the past few years, death due to ectopic pregnancy has declined.[7,8] The increase in incidence is because of increase in STD rates, cesarean rates and increasing ART pregnancies. On the other hand, availability of ultrasound and other diagnostic modalities and improvement in health facilities has helped to reduce the maternal morbidity and mortality.[8-10] Absence of identifiable risk factors, varied clinical presentation, and non-availability of ultrasound may cause delay in diagnosis. Delayed diagnosis or late referral resulting in ruptured ectopic pregnancy may increase

the maternal morbidity and mortality. Early diagnosis can make medical management and conservative surgery feasible. This can have a huge impact on the future fertility of the affected women. This study aims at evaluating the incidence, predisposing risk factors, clinical features, diagnosis and management of ectopic pregnancy in a tertiary care teaching hospital.

Material and methods

This prospective observational study was carried out in the Department of Obstetrics and Gynecology, lady Harding medical college, New Delhi, India, for 15 months. After taking the approval of the protocol review committee and institutional ethics committee. After taking informed consent detailed history was taken from the patient or the relatives if the patient was not in good condition. Total 100 cases were diagnosed with ectopic pregnancy.

The details of history included age, parity, presenting symptoms, past obstetric history, past history of surgeries or medical disorders, use of contraception and history of infertility. Sexual history was taken in detail to note any high risk for STD/PID. A detailed general physical examination, abdominal and bimanual examination was done. All the patients were subjected to urine pregnancy tests and ultrasound. Culdocentesis was done in few patients. Routine blood and urine investigations were done. All the patients underwent laparotomy or laparoscopy. All 100 patients underwent surgical treatment. Intra operative findings, surgical procedure, blood requirement, post-operative morbidity and outcome were recorded. Prophylactic antibiotics were given to all patients at the time of induction of anaesthesia. Patients were followed up in the post-operative period with special attention to the development of fever, abdominal pain, distension of the abdomen and wound sepsis. Patients were discharged with an advice to come for follow up after a week.

Results

During the study period, 39000 deliveries and 100 ectopic pregnancies. Therefore, the

incidence of ectopic pregnancy (0.024%) or 2.4 per 1000 deliveries.

Table1: Distribution of cases according to age

Age (years)	N =100	Percentage
20-25	48	48
26-30	32	32
30-35	13	13
Above 35	7	7

Table 2: Distribution of the cases by socio-economic status

Socio-economic status	No. of cases	Percentage
Low	65	65
Medium	20	20
High	15	15
Total	100	100

Table 1 gives the distribution of cases of ectopic pregnancy according to age. The mean age of the patients was 27.37 ± 4.35 years. Majority of the patients 48 (48%) belonged to 20-25 years. 80% of the patients were ≤ 30 years. Table 2 show that most of the patients 65 (65%) belonged to lower class socioeconomic status. Table 3 shows the distribution of the cases based on parity. Majority of the patients 72(72%) were multiparous. 17(17)% of the patients were nulliparous.

Table 3: Distribution of cases according to parity

Parity	N=100	Percentage
Nullipara	17	17
Primipara	11	11
Multipara	72	72

Table 4 shows the distribution of cases according to the site of ectopic pregnancy. The most common site of ectopic pregnancy was fallopian tube 88(88%). Ampulla was the commonest site 67(67%) for ectopic implantation in the fallopian tube. Heterotopic pregnancy is rare where pregnancy is seen in the uterus and tube at the same time. In our study, there were 3(3%) cases of heterotopic pregnancies.

Table 4: Distribution of cases according to site of ectopic pregnancy

Site of Ectopic Pregnancy	N =100	Percentage
1. Fallopian Tube	88	88
Ampullary	67	67
Isthmic	10	10
Fimbrial	8	8
Cornual	3	3
2. Ovarian	8	8
3. Abdominal	1	1
4. Heterotopic Pregnancy	3	3
Total	100	100

Table 5 shows the distribution of risk factors identified in the patients with ectopic pregnancy. The most common risk factor was pelvic inflammatory disease 44(44%) followed by H/o previous abortion 20(20%) and H/o previous abdominopelvic surgery including tubal ligation, LSCS and appendicectomy 23(23%). Although any form of contraception decreases the overall risk of pregnancy including ectopic Pregnancy, when contraceptive failure occurs in women using an IUCD or following tubal sterilization, risk of Ectopic Pregnancy is elevated. In our study, 13(13 %) patients were using copper IUCD. H/o infertility due to tubal block or other causes, treatment associated with infertility, endometriosis and H/o previous ectopic pregnancy were other identified risk factors.

Almost 90% patients in our study came with H/O variable period of amenorrhoea. 84(84%) cases complained of abdominal pain. 60% of the patients had bleeding or spotting per vaginum. The other symptoms noted in our study were syncope 26(26%), nausea / vomiting 31(31%) and urinary symptoms 18(18%). In our study, 91(91%) of patients had severe pallor. The high incidence of pallor was probably because 78(78%) of cases were associated with ruptured ectopic pregnancy or tubal

abortion. The most important signs which guided in the diagnosis of ectopic pregnancy were cervical excitation pain 68(68%), abdominal tenderness 61(61%), adnexal mass or fullness 57(57%) and tenderness in the fornix 63(63%).

In the present study, urine pregnancy test was positive in 91(91%) of patients. Culdocentesis was positive in 39(39%) of patients. Ultrasound was able to diagnose 80(80 %) of cases. USG findings suggestive of ectopic pregnancy were extra-uterine gestational sac 12(12%), haemoperitoneum 57(57%) and adnexal mass 74(74%).

In the present study, the incidence of ruptured ectopic pregnancy was 86%. 93% of the patients received one or more units of blood transfusion intra operatively and/or post operatively. All the patients with ectopic pregnancy were managed surgically. 96% patients underwent laparotomy and 4 % patients had laparoscopic treatment. 96% patients underwent unilateral or bilateral salpingectomy or salpingoophrectomy. Milking of tube was performed in 1% of patients. Concurrent dilatation and curettage was performed in the patients who had heterotopic pregnancy 2(2%). There was no maternal mortality in the present study.

Table 5: Distribution of cases according to risk factors

Risk Factors	N=100	(%)
No obvious risk factor	20	20
H/o pelvic inflammatory disease	44	44
Previous Ectopic Pregnancy	2	2
H/o abdominopelvic surgeries	14	14
Tubectomy/Tubal surgery	3	3
LSCS	4	4
Others (e.g. Appendicectomy)	0	0
H/O IUCD usage	13	13
H/O Oral contraceptive pill usage	10	10
H/O Previous abortion	18	18
H/O infertility	9	9
H/O Endometriosis	1	1
abdominal pain	84	84
bleeding or spotting per vaginum	60	60

Discussion

Ectopic pregnancy is a common obstetrical emergency in early pregnancy all over the world. Even today, it remains the important cause of maternal mortality and morbidity. In the present study, the incidence of ectopic pregnancy was 0.024%. The incidence of ectopic pregnancy in other Indian studies conducted during 1996 to 2015 ranged from 0.25% to 1.9%. [8-17] Similar to our study, there was an increasing trend in the incidence of ectopic pregnancies in the studies conducted by Jophy et al (7.4 per 1000 live births to 15.2 per 1000 live births) and Porwal et al. [8,9] Shobeiri et al conducted a study of 872 women with ectopic pregnancy in Iran during 2000 to 2010. They found that the incidence of ectopic pregnancy increased from 1.5 per 1000 pregnancy in 2000 to 4.8 per 1000 pregnancy in 2010. Majority of the patients 48 (48%) belonged to 20-25 years. 80% of the patients were ≤ 30 years. Similar to our study, most studies reported that majority of women diagnosed with ectopic pregnancy belonged to this age group. [9,11-20] This is probably because sexual activity and fertility of women is highest during this period. In the present study. Majority of the patients 72(72%) were multiparous. 17(17)% of the patients were nulliparous, which was comparable with studies by Bhuria et al, Rakhi et al, Yadav et al and Prasanna et al. [10,17,20,21] In the present study, the most common site of ectopic pregnancy was fallopian tube 88(88%). Ampulla was the commonest site 67(67%) for ectopic implantation in the fallopian tube. Ampullary pregnancy was seen in 53.84% to 80% of the ectopic pregnancies in other studies. [10,11,13,20] In our study, there were 2(2%) cases of heterotopic pregnancies. In our study, 6% of the ectopic pregnancy was ovarian. In other studies, the non-tubal sites for ectopic pregnancy were ovaries, cervix, broad ligament, rudimentary horn of uterus and abdominal cavity. [10,11,15,20] In the present study, The most common risk factor was pelvic

inflammatory disease 46 (46%). Yadav ST et al, Yadav A et al, Jophy et al and Shivakumar et al also found H/O PID as the major risk factor for ectopic pregnancy. [8,10,12,16] Moini et al reported a strong association between prior PID and ectopic pregnancy. [22] Past history of previous abortion with or without D&C was found to be an important risk factor in most studies including the present study. [8,10-14,21] This is probably because of tubal damage following post abortal infections. Although any form of contraception decreases the overall risk of pregnancy including ectopic Pregnancy, when contraceptive failure occurs in women using an IUCD or following tubal sterilization, risk of ectopic Pregnancy is elevated. In our study, we found that IUCD or oral contraceptive pill usage predisposed to ectopic pregnancy. A higher incidence of ectopic pregnancy among IUCD users was noted in most studies. [8,10,13] Parashi et al found that usage of IUCD increases the risk of ectopic pregnancy significantly whereas oral contraceptive pills prevent ectopic pregnancy. [23] Moini et al found that usage of IUCD increased the risk of subsequent ectopic pregnancy four to fivefold. [22] Probably, IUCDs predispose to PID or induce inflammatory changes in the endosalpinx leading to subsequent ectopic pregnancy. Therefore, women with poor menstrual hygiene, those at risk of STDs/PID should be suggested alternative (barrier) methods of contraception. In our study, tubal ligation was associated with ectopic pregnancy in 3(3%) of patients. Other studies have reported that the risk of tubal pregnancy following tubal ligation or tubal surgery is 5.4% to 16.21%. [8,10-12 16,21] Moini et al reported that women with previous tubal surgery were likely to have ectopic pregnancy two to three times more than controls. [22] In the present study, 2% of the study subjects had past history of ectopic pregnancy. Other studies noted that 5.4% to 10.95% of women with ectopic pregnancy had H/o prior ectopic pregnancy. [8,10,16,20,21] Moini et al have reported that among all the risk factors of ectopic

pregnancy the association between subsequent ectopic pregnancy and previous ectopic pregnancy was the strongest. [22] Parashi et al found an increased risk of 7-9 fold in women with previous ectopic pregnancy.[23] H/o infertility was found in 9(9%) of women in the present study. Other studies have observed that 10%-23.7% of women with ectopic pregnancy had history of infertility.[8,11-14,20,21] Tubal pathology, endometriosis, ovulation induction and ART are the probable reasons for association of infertility with occurrence of ectopic pregnancy. Moini et al found a strong association between infertility and ectopic pregnancy.[22] However; Parashi et al did not find significant association of infertility with occurrence of ectopic pregnancy.[23] In the present study, H/o previous abdominopelvic surgery including tubal ligation, LSCS and appendectomy 23(23%) women. Simsek Y et al analysed the risk factors in 35 ectopic pregnancies. They found that 46% women had history of Caesarean section.[24] Parashi et al found that there was a significant relationship between abdominal/pelvic surgery and incidence of ectopic pregnancy.[23] In their studies, Wakankar et al and Yadav A et al reported that 32% and 26.02% of women with ectopic pregnancy respectively had history of LSCS.[10,13] A possible explanation for this association is formation of peritubal adhesions. Ragab et al conducted a univariate and multivariate analyses of various risk factors for ectopic pregnancy and demographic characteristics. Univariate analyses showed that H/o previous abortion, H/o abdominal surgery, PID, H/o previous D&C and IVF were associated significantly with increased risk of ectopic pregnancy. Multivariate analyses showed that past abdominal surgery, IVF, H/o PID were the only significant risk factors in nulliparous women.[25] The present study and other comparative studies show that PID, previous abortions, abdominopelvic surgeries contribute to the risk of subsequent ectopic pregnancy. These risk factors are modifiable. Early diagnosis and

adequate treatment of PID, performing D&C under strict aseptic conditions, ensuring adequate haemostasis during surgeries, employing methods to reduce post op adhesions during surgery and adequate antibiotic cover may help in reducing the incidence of ectopic pregnancy. In the present study, 20% of women had no identifiable risk factor. Other studies have also reported that ectopic pregnancy can occur in women (20%-58.3%) with no identifiable risk factor.[8,11,12,16,21] This fact emphasizes that ectopic pregnancy should be suspected when clinical features are suggestive of ectopic pregnancy even in low risk women. One has to remember that absence of symptoms does not rule out ectopic pregnancy. Almost 90% patients in our study came with H/o variable period of amenorrhoea. Similar observation was noted by Prasanna et al (96%).[21] In other studies, amenorrhoea was noted in 54.9%-84.3% patients.[8,11-13,15,20] Abdominal pain was seen in 84(84%) cases in the present study. Other studies reported that abdominal pain was a frequent and constant symptom in 80%- 95% patients.[8,11-13,16,20,21] In the present study, 60% of the patients had bleeding or spotting per vaginum. This was similar to the observations by Yadav ST et al (72.2%), Shivakumar et al (70%), Jophy et al (66.6%) and Wakankar et al (65.4%).[8,12,13,16] However, the classical triad of amenorrhoea, abdominal pain and vaginal bleeding was seen in 54% of the cases in the present study which was comparable to the observation by Wakankar et al (53.84%) and Shetty et al (50%).[5,11] Only 21% of the cases had presented with the classical triad of symptoms in the study by Shukla et al. This shows that unless the obstetrician has high index of suspicion, diagnosis of ectopic pregnancy may be missed or delayed.[15] Clinical presentation, urinary pregnancy test, culdocentesis and ultrasound were the diagnostic tools used for diagnosis of ectopic pregnancy. In the present study, urine pregnancy test was positive in 91(91%) of patients. This was in

concordance with the studies by Gaddagi et al (97.3%), Prasanna et al (94%), Yadav ST et al (100%) and Shukla et al (98.04%).[11,15,16,21] In the present study, culdocentesis was positive in 39(39%) of patients. This was comparable to the study by Gaddagi et al (37.8%).[11] In the present study, Ultrasound was able to diagnose 80(80%) of cases. USG findings suggestive of ectopic pregnancy were extra-uterine gestational sac 12(12%), haemoperitoneum 57(57%) and adnexal mass 74(74%), as against an incidence of 60.52% - 89.1% as observed in other studies.[11,13-15,17] This shows that majority of cases with ectopic pregnancy present as ruptured ectopic pregnancies. This emphasizes the need for early diagnosis. Women with high risk of ectopic pregnancy must be emphasized to consult the obstetrician as early as possible when they miss the periods. In the present study, all the patients with ectopic pregnancy were managed surgically. 96% patients underwent laparotomy and 4% patients had laparoscopic treatment. In most studies, surgery was the main stay of treatment.[9-13] In the present study and in the studies by Bhuria et al and Shetty et al, 94%, 95.2% and 98% of the patients underwent unilateral or bilateral salpingectomy or salpingoophorectomy respectively.[7,17] Treatment modality for ectopic pregnancy depends on site of pregnancy, ruptured or unruptured pregnancy, availability of laparoscopy, surgical expertise, need to retain fertility and choice of patient. There was no maternal mortality in our study as reported by many other studies.[7-16] This shows that early diagnosis, timely and prompt management of ectopic pregnancy, availability of adequate blood and blood components improves the outcome of ectopic pregnancies. Delay in seeking healthcare, accessibility to expert health facilities, initial misdiagnosis and delayed referral are important deterrents to prompt management of ectopic pregnancy.[26]

Conclusion

Ectopic pregnancy is one of the commonest gynaecological emergencies with significant maternal morbidity and mortality. The incidence of ectopic pregnancy is on the rise. The incidence of ruptured ectopic pregnancy is high in developing countries due to late diagnosis and delayed referral. In developing countries, PID and postabortal sepsis continue to be the most important risk factor for ectopic pregnancy.

Reference

1. Kumar P, Malhotra N. Jeffcoate's principle of gynaecology. New Delhi: Jaypee Brothers Med Public. 2008:619.
2. Yeasmin MS, Uddin MJ, Hasan E. A clinical study of ectopic pregnancies in a tertiary care hospital of Chittagong, Bangladesh. *Chattagram Maa-O-Shishu Hospital Med Coll J*. 2014;13(3):1-4.
3. Watts J, Thomson AM. Excitatory and inhibitory connections show selectivity in the neocortex. *J Physiol*. 2005;562(1):89-97
4. Lau S, Tulandi T. Conservative medical and surgical management of interstitial ectopic pregnancy. *Fertil Steril*. 1999; 72:207-15
5. Leke RJ, Goyaux N, Matsuda T, Thonneau PF. Ectopic pregnancy in Africa: a population-based study. *Obstet Gynecol*. 2004; 103:692-97.
6. Thonneau P, Hijazi Y, Goyaux N, Calvez T, Keita N. Ectopic pregnancy in Conakry, Guinea. *Bull World Health Organ*. 2002; 80:365-70.
7. Shetty VH, Gowda S, Lakshmidhevi M. Role of ultra-sonography in Diagnosis of ectopic pregnancy with clinical analysis and management in tertiary care hospital. *J Obstet Gynecol Ind*. 2014;64(5):354-57.
8. Jophy R, Thomas A, Mhaskar A. Ectopic pregnancy -5-year experience. *J Obstet Gynecol Ind*. 2002; 52:55-8.
9. 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. JPBMS. 2012;16(07):1-3.
9. Yadav A, Prakash A, Sharma C, Pegu B, Saha MK. Trends of ectopic pregnancies in Andaman and Nicobar Islands. *Int J Reprod Contracept Obstet Gynecol.* 2017;6:15-9
 10. Gaddagi RA, Chandrashekhar AP. A Clinical Study of Ectopic Pregnancy. *J Clin Diagn Res.* 2012;6(5):867-9.
 11. Shivakumar HC, Umashankar KM, Ramaraju HE. Analysis of forty cases of ectopic pregnancies in tertiary care hospital in south India. *Indian Journal of Basic and Applied Medical Research;* 2013; 3(1):235-241.
 12. Wakankar R, Kedar K. Ectopic Pregnancy- A rising Trend. *Int J Sci Stud.* 2015;3(5):18-22.
 13. Mufti S, Rather S, Mufti S, Rangrez RA, Wasiqa, Khalida. Ectopic pregnancy: an analysis of 114 cases. *JK Practitioner.* 2012;17(4):20-3.
 14. Shukla DB, Jagtap SV, Kale PP, Thakkar HN. Study of ectopic pregnancy in a tertiary care centre. *Int J Reprod Contracept Obstet Gynecol.* 2017;6:975-9.
 15. Yadav ST, Kaur S, Yadav SS. Ectopic pregnancy an obstetric emergency: retrospective study from medical college Ambala, Haryana, India. *Int J Reprod Contracept Obstet Gynecol.* 2016;5:2210-4.
 16. Bhuria V, Nanda S, Chauhan M, Malhotra V. A retrospective analysis of ectopic pregnancy at a tertiary care centre: one year study. *Int J Reprod Contracept Obstet Gynecol.* 2016; 5:2224-7.
 17. Nair L, Peter N, Rose A. *International Journal of Biomedical Research* 2015;6(05):331-3.
 18. Shobeiri F, Tehranian N, Nazari M. Trend of ectopic pregnancy and its main determinants in Hamadan province, Iran (2000-2010). *BMC research notes.* 2014;7(1):733.
 19. Rakhi, Mital PL, Hooja N, Agarwal A, Makkar P, Andleeb F. Ectopic pregnancy: a devastating catastrophe. *Sch J App Med Sci.* 2014;2(3A):903-7.
 20. 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.
 21. Moini A, Hosseini R, Jahangiri N, Shiva M, Akhoond MR. Risk factors for ectopic pregnancy: A case-control study. *J Res Med Sci.* 2014; 19:844-9.
 22. Parashi S, Moukhah S, Ashrafi M. Main risk factors for ectopic pregnancy: a case-control study in a sample of Iranian women. *Int J Fertil Steril.* 2014; 8:147-54.
 23. Simsek Y, Oguzhan A M. Analysis of ectopic pregnancies admitted to emergency department. *Turk J Emerg Med.* 2015;15(4):151-154.
 24. Ragab A, Mesbah Y, El-Bahlol I, Fawzy M, Alsammani MA. Predictors of ectopic pregnancy in nulliparous women: A case-control study. *Middle East Fertility Society Journal.* 2016;21(1):27-30.
 25. Naseem I, Bari V, Nadeem N. Multiple parameters in the diagnosis of ectopic pregnancy. *J Pak Med Assoc.* 2005;55(2):74-6.
 26. Awoleke JO, Adanikin AI, Awoleke AO. Ruptured tubal pregnancy: predictors of delays in seeking and obtaining care in a Nigerian population. *Int J Women Health.* 2015; 7:141-7