

# Ruptured Ectopic Pregnancy at Tertiary Care Centre: A Cross-sectional Study



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## Abstract

**Objectives:** Ectopic pregnancy (EP) is the leading cause of early pregnancy accounting for 10-15% of pregnancy-related deaths. It is life-threatening condition where the majority of them present late. This study aims to evaluate the incidence, risk factors, clinical features, diagnosis, and management of EP in the tertiary care center.

**Materials and Methods:** This study conducted a retrospective analysis of electronic medical records from June 2015 to June 2020, focusing on participants in the age group of 18 to 45 years, to examine the occurrence of EP. The data were analysed with simple descriptive statistics and presented in frequency tables and charts of age group, parity, anemia grades, risk factors and presenting symptoms.

**Results:** The incidence of EP in the current study was 0.38%. In the present study, 73.8% of women were of 20–30-year-old. In this study, 54.1% of women had a history of pelvic inflammatory disease (PID). Prior EP was seen in 19.7 % of cases. 16.4% of participants had a prior history of tubectomy and 19.7% had a previous history of infertility treatment, and 21.3% had a previous history of lower segment caesarean section (LSCS). In the present study, 65.5% of women presented with amenorrhea of 4-8 week, and 95% had abdominal pain. In the present study, common site was the right fallopian tube in 73.9% of cases. In this study, all cases need surgical management most common procedure carried out was salpingectomy. intensive care unit (ICU) admission was needed in 26.2% of cases, and no mortality was seen in our study.

**Conclusions:** EP is a serious and potentially life-threatening condition. Early diagnosis and prompt management are crucial in reducing maternal mortality and morbidity rates.

**Keywords:** Ectopic pregnancy, Salpingectomy, Abdominal pain

## Introduction

Ectopic pregnancy (EP) or extrauterine pregnancy is the blastocyst implants anywhere other than the endometrial lining of the uterine cavity (1). EP is one of the major causes of early pregnancy-related deaths (10-15%). The study conducted by the centers for disease control and prevention show an increase in the number of ectopic pregnancies in the critical state during the past 20 years, at the rate of 16 ectopic pregnancies for 1000 reported pregnancies (2).

The risk of EP increases by 7-13-fold in a subsequent pregnancy after the first episode of EP. The chance of subsequent pregnancy being intrauterine is 50-80%, and the chance that the pregnancy will be tubal in 10-25%, the remaining participants may present as infertile (3,4).

The various risk factors associated with increased risk for tubal pregnancy include prior tubal surgeries like tubectomy, tubal reconstructive surgeries, chronic pelvic inflammatory diseases (PIDs), previous tubal pregnancy, current intrauterine device use, use of contraceptive pills, infertility status also have been identified (1). EP remains the major cause of maternal morbidity and mortality in developing countries, where the majority of

the women present in the late-stage as hemoperitoneum and shock. The problem is increasing worldwide due to the rising incidence of PID, greater prevalence of Sexually Transmitted Diseases and PID, usage of diagnostic tools like laparoscopy (5).

The delayed childbearing and their accompanying use of ART also increased the incidence of EP (1). Early diagnosis using serum beta human chorionic gonadotropins, and timed intervention can reduce mortality and morbidity.

This study aimed to evaluate the incidence, risk factors, clinical features, diagnosis, and management of ruptured EP at a tertiary center.

## Materials and Methods

This cross-sectional study was done in the obstetrics and gynecology department at BLDE(DU), Shri. B.M. Patil Medical College and hospital and research center. It was a retrospective analysis of ruptured EP from June 2015- June 2020. The case notes were traced from the operation theatre register, and case sheets were obtained from the medical records section after obtaining permission from the medical superintendent. Information regarding the participants clinical profile, risk factors, and surgical

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**Key Messages**

- ▶ Early diagnosis and management can reduce maternal mortality and morbidity.

details was obtained. The obtained data were analysed by simple descriptive statistics and frequency tables and charts.

*Inclusion criteria:* All women in the age group between 18-45 years diagnosed with ruptured EP.

*Exclusion criteria:* Age less than 18 years, more than 45 years, and heterotrophic pregnancy.

*Setting:* Obstetrics & gynaecology department at tertiary care hospital from June 2015 – June 2020.

*Participants:* All women in the age group between 18-45 years diagnosed with ruptured EP.

*Variables:* clinical profile, risk factors, and surgical details

*Data sources/measurement:* case sheets were obtained from the medical records section.

*Sample size:* all cases of ruptured EP between the above-mentioned duration.

**Data Analysis**

The data were analysed with simple descriptive statistics and presented in frequency tables and charts of age group, parity, anaemia grades, risk factors and presenting symptoms.

**Results**

During this retrospective study, total deliveries were 15560 and the ruptured EP were 61, with incidence of 0.38% or 3.8 per 1000 deliveries.

As shown in Figure 1, nine participants (15%) were nulliparous, while 21 participants (34.4%) were

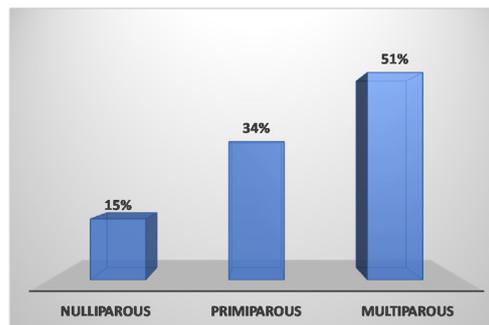


Figure 1. Parity Wise Distribution of Study Subjects.

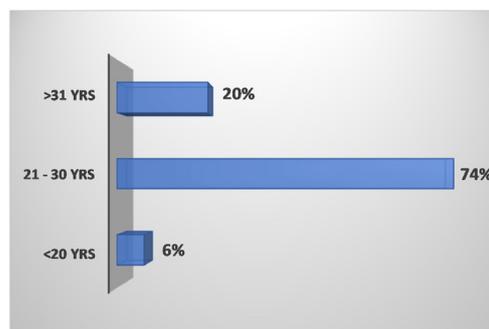


Figure 2. Distribution of Patients According to Age.

primiparous and 31 participants (50.8%) were multiparous.

Figure 2 depicts demographic characteristics according to which the majority (45) of participants (74%) were in the age group of 21-30 years, 12 participants (20 %) were aged more than 30 years, and 4 participants (6%) were age less than 20 years.

Table 1 shows clinical features; about 40 (65.5%) participants presented with ruptured ectopic at a gestational age of 4-8 weeks. The commonest presentation

Table 1. Distribution of Participants According to Age and Parity (N=61)

Clinical features	No. (%)	Parity			Age Group (y)		
		Nullipara (n=9)	Primipara (n=21)	Multipara (n=31)	<20 (n=45)	20-30 (n=12)	>30 (n=4)
Amenorrhoea							
Nil	15 (24.6)	01	05	09	11	03	01
4-8 weeks	40 (65.5)	07	13	20	32	06	02
>8 weeks	6 (9.8)	01	03	02	02	03	01
Clinical features			<i>P</i> = 0.741			<i>P</i> = 0.208	
Abdominal pain	58 (95)	04	08	46	52	04	02
Per vaginum bleeding	33 (54)	02	04	27	27	05	01
Syncope	14 (23)	02	04	08	12	01	01
Shock	19 (31.1)	01	05	13	17	02	00
Haemogram			<i>P</i> = 0.536			<i>P</i> = 0.802	
2-4	5 (8.2)	01	03	01	03	02	00
4.1-6.0	14 (23)	02	04	08	06	07	01
6.1-8.0	18 (29.5)	02	06	10	13	03	02
8.1-10.0	16 (26.2)	03	08	05	15	00	01
>10	8 (13.1)	01	00	07	08	00	00
<b>Total</b>	61 (100)		<i>P</i> = 0.273			<i>P</i> = 0.026	

was abdominal pain seen in 58 (95%) cases, followed by vaginal bleeding in 33 (54%) cases. Around 19 (31.2%) of participants had very severe anaemia of 2-6 g/dL, 18 (29.5%) had Hemoglobin (Hb) of 6.1-8 g/dL presented as severe anaemia, 16 (26.2%) had mild to moderate anaemia, 8-10 g/dL with no anaemia in 8 (13.1%) participants.

Risk factors (Figure 3) were seen in 51 participants (83.6%) of cases, 33 (48 %) participants had a history of PID, 12(17%) participants had a history of prior abortion and ectopic, 11 (16%) participants had a history of tubectomy, 13 (19 %) participants had a history of previous lower segment caesarean section (LSCS).

Table 2 shows intraoperative findings. Out of 61 participants, 51 (83.6%) participants presented with ruptured ectopic gestation at the time of presentation, 10 (16.4%) had unreturned ectopic gestation, and out of 61 participants, right-sided tubal pregnancy was seen in 39 (73.9%) of cases and left the fallopian tube in 15 (24.6%) of the case and right cornual in 1(1.6%) right ovary 1(1.6%), left ovary 1 (1.6%), left rudimentary horn 3(4-9%) of cases and right rudimentary horn 1.

Distribution of participants according to the quantity of hemoperitoneum, about 31 (50.8%) of participants had blood loss of less than 1000 ml, 22 (36%) had blood loss amount of 1000-2000 mL, 8 (13%) of participants had blood loss more than 2000 mL. About 92 (86.9%) participants had received blood transfusion & 8 (13.1%) of participants did not receive any blood transfusion. Total 5 (8.2%) participants received 5 pints of blood transfusion whereas ICU admission was needed in 26.2% of cases.

Table 3 shows surgical procedure shows that out of 61 participants, 32 (52.5%) underwent total salpingectomy, 11 (18.1%) had bilateral salpingotomy, right and left salphingoophorectomy was done in 1 case (1.6%), 12 cases (19.7%) had salpingectomy, resection of the rudimentary horn was done in 4 (6.5%) of cases.

## Discussion

The ruptured EP were 61, with the incidence of 0.38% or 3.8 per 1000 deliveries. In 51 participants (83.6%) of cases, 33 (54.1%) participants had a history of PID, 12(19.7%) participants had a history of prior abortion and ectopic, 11 (18%) participants had a history of tubectomy, 13

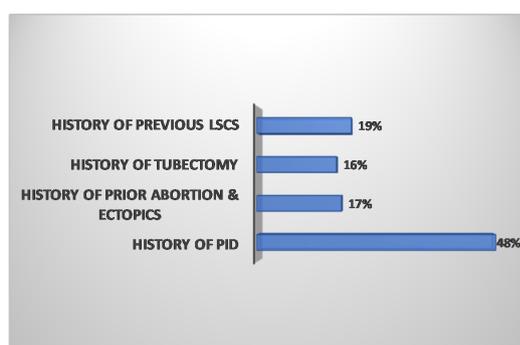


Figure 3. The Distribution of Risk Factors.

Table 2. Distribution of Participants According to Intraoperative Findings

	No.	%
Ruptured	51	83.6
Unruptured	10	16.4
Total	61	100
Site of ectopic pregnancy		
Right fallopian tube	39	73.9
Left fallopian tube	15	24.6
Right cornual	1	1.6
Right ovary	1	1.6
Left ovary	1	1.6
Left rudimentary horn	3	4.9
Right rudimentary horn	1	1.6

Table 3. Distribution of Participants According to Surgical Procedure

Surgical Procedure	No.	%
Total salpingectomy	32	52.5
Bilateral salpingectomy	11	18.1
Right salphingoophorectomy	1	1.6
Left salphingoophorectomy	1	1.6
Salpingotomy	12	19.7
Resecting rudimentary horn	4	6.5
Total	61	100

(21.3%) participants had a history of previous LSCS. Out of 61 participants, 51 (83.6%) participants presented with ruptured ectopic gestation at the time of presentation, about 8 (13%) of participants had blood loss more than 2000 mL. Out of 61 participants, 32 (52.5%) underwent total salpingectomy, 11 (18.1%) had bilateral salpingotomy, Ruptured EP is a major cause of mortality and morbidity in first trimester of pregnancy. The incidence of EP has increased over the last 20 years. Due to early diagnosis using beta human chorionic gonadotropin and ultrasound, the incidence of ruptured EP has decreased. The incidence of EP in the current study was 0.38%. The incidence of ectopic pregnancies in other Indian studies conducted between 2015-2020 ranged from 0.63-1.6% (6,7).

In the present study, 73.8% of women were 20-30 years old, which is similar to the other studies (6,8,9). This is due to the fertility of women being highest during this period. Around 19.7% of women were more than 30 years.

In the present study, 50.8% of participants were multiparous, which was less as compared to several studies (13-15) and about 14.8% cases occurred in nulliparous women. In line with several studies (10,12,13,16), in the present study, 54.1% of women presented with a history of PID. Prior EP was in 19.7% of cases. 16.4% had a previous history of tubectomy; hence 19.7% had a previous history of infertility treatment, and 21.3% had a previous history of LSCS.

The risk factors, such as the contraception, intrauterine contraceptive devices (IUCD), and tubal sterilization

increase the incidence of EP. In one study, contraception failure (IUCD) was seen in 16.4% of cases, but IUCD's previous history of tubal ligation also risk factors for EP. In the present study, prior tubal ligation was seen in 16.4% of cases, which a lesser incidence of 6% (6); other studies reported risk of tubal surgery from 5.4-16.2% where, Moini et al (17) reported that participants with previous tubal surgery were likely to have EP two to three times more than the control group.

In the present study, 19.7% of women have a history of EP, which was higher than Ganitha and Anuradha's study (6) where 2% of subjects had a history of EP. Parashi et al (18) found an increased risk of 7-9-fold in women of previous EP. History of infertility was found in 19.7% whereas Ganitha and Anuradha (6) found have found incidence in 8% of women. Various other studies have reported an incidence of 23.7% of incidence infertility.

In our study, 21.3% of cases with a history of previous LSCS and other prior surgery were dilatation and curettage in 1.6% and laparoscopic ovarian drilling in 1.6% cases. Other study (19) observed that 46% of women had previous LSCS, previous history of abdominal surgery predisposes to EP, probably due to peritoneal adhesions.

Various studies, including the present study, justify that PID, previous abdominal surgeries, previous abortions increase the significant risk factors for subsequent EP with adequate treatment and precautions, the incidence of EP can be reduced (6,8).

In the present study 37.8% had no identified risk factors. One study has reported EP can occur in women with no risk factor in 20%-58.3% of women, so EP should be suspected even in women with low-risk factors.

In the present study, 65.5% of women presented with amenorrhea of 4-8 wk duration and 9.8% presented with amenorrhea of 7-8 wk, and 24.6% had no relevant history of amenorrhea either they presented as continuous bleeding or as irregular bleeding. It was noted a history of variable amenorrhea in 96% (15) of the cases, while more was noted 98% (6).

In the present study, 95.1% of the participants come with abdominal pain, 54.1% with bleeding per vagina, 23% with the syncopal attack, and 31.1% of participants presented in shock. Various studies have reported abdominal pain was a symptom in 80%-95% of cases. Yadav et al (10) reported bleeding per vagina was seen in 72.2% of cases. The triad of amenorrhea, abdominal pain, vaginal bleeding was seen in 50.4% of the cases compared to 53.84% in Walker's study (20), 56% in Ganitha & Anuradha (6), so one should have high suspicious in diagnosing EP.

In the present study, 31.1% of participants came with a shock, 18% with abdominal distention, while in the study of Bhuria et al (8), only 7.69% presented with shock and 1.18% with abdominal pain distention.

When hemoglobin was compared, very severe anemia was seen in 31.2% of cases, moderate anemia was seen in 29.5% of cases, and mild in 13.1% of participants were

hemodynamically stable. In the present study, 13.1% of the patient did not require blood without blood transfusion, while 19.7% of participants required >4 units of blood transfusion, a 86.9% cases required blood transfusion.

In the present study, the most common site was the right fallopian tube seen in 73.9% of cases, left fallopian tube was seen in 24.6% of cases. There were right cornual ectopic in 1.6% of cases, right ovary 1.6%, left ovary 1.6%, and rudimentary horn in 4.9% of cases. In the study conducted by Bhuria et al (8) most common site of ectopic was the right side in 63% of cases.

In the present study, ruptured EP was seen in 83.6% of cases, similar to the study done by Ganitha & Anuradha (6), so the majority of EP and this high incidence show need to use USG and serum beta HCG in the first trimester to diagnose ectopic.

In the present study, out of 61 participants, 52.5% underwent total salpingectomy, 18.1% had bilateral salpingotomy, right and left salphingoophorectomy was done in 1.6%, 19.7% had salphingotomy, resection of the rudimentary horn was done in 6.5% of cases.

In the present study, general anesthesia was used in 37.7% of cases and spinal anesthesia was used in 60.7% of cases, and ICU admission was needed in 26.2% of cases.

#### Limitations of study

This study was done mainly by obtaining the information from the OT register; hence, some medically and expectantly managed cases were missed. The effect of smoking and lifestyle changes on EP could not be studied. Post-surgical follow-up for conception was not studied.

#### Future studies

In the future prospective studies, can be done by analyzing all cases of EP which were managed medically using methotrexate, other surgical techniques using laparoscopy, and correlation of serum beta HCG and in methotrexate.

#### Conclusions

EP is an obstetric emergency. Early diagnosis and timely intervention can reduce maternal morbidity and mortality. The incidence of EP is rising due to PID and prior history of surgery, especially in developing countries. Surgery along with blood transfusion is the mainstay of treatment. The incidence of EP can be reduced by taking appropriate precautions.

#### Author's Contribution

**Conceptualization:** Shobha Shiragur, Praveen Ganganahalli.

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**Formal analysis:** Praveen Ganganahalli, Dr. Muttappa Gudadinni.

**Methodology:** Shobha Shiragur, Preeti Patil, Praveen Ganganahalli.

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**Resources:** Shobha Shiragur, Shailaja Bidri, Aruna Biradar, Rajshri Yaliwal.

**Supervision:** Shailaja Bidri, Aruna Biradar, Rajshri Yaliwal.

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**Writing–original draft:** Shobha Shiragur, Preeti Patil, Praveen Ganganahalli.

**Writing–review & editing:** Muttappa Gudadinni, Shailaja Bidri, Aruna Biradar, Rajshri Yaliwal.

#### Conflict of Interests

There was no conflict of interest among the authors during the research.

#### Ethical Issues

Clearance was taken from Institutional Ethics Committee, BLDE(DU) Shr.B.M. Patil Medical College, Vijayapura ECR/383/Inst/KA/2013/RR-20).

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#### References

1. Ectopic pregnancy. In: Williams Gynaecology. 2nd ed. McGraw-Hill Education/Medical; 2012.
2. Berek JS. Berek & Novak's Gynecology. 14th ed. Lippincott Williams & Wilkins; 2006:604.
3. Chow WH, Daling JR, Cates W Jr, Greenberg RS. Epidemiology of ectopic pregnancy. *Epidemiol Rev.* 1987;9:70-94. doi:10.1093/oxfordjournals.epirev.a036309
4. Levin AA, Schoenbaum SC, Stubblefield PG, Zimicki S, Monson RR, Ryan KJ. Ectopic pregnancy and prior induced abortion. *Am J Public Health.* 1982;72(3):253-256. doi:10.2105/ajph.72.3.253
5. Weström L, Bengtsson LP, Mårdh PA. Incidence, trends, and risks of ectopic pregnancy in a population of women. *Br Med J (Clin Res Ed).* 1981;282(6257):15-18. doi:10.1136/bmj.282.6257.15
6. Ganitha G, Anuradha G. A study of incidence, risk factors, clinical profile and management of 50 cases of ectopic pregnancy in a tertiary care teaching hospital. *Int J Reprod Contracept Obstet Gynecol.* 2017;6(4):1336-1342. doi:10.18203/2320-1770.ijrcog20171388
7. Sudha VS, Thangaraj DR. A retrospective study on ectopic pregnancy: a two year study. *Int J Reprod Contracept Obstet Gynecol.* 2016;5(12):4365-4369. doi:10.18203/2320-1770.ijrcog20164344
8. 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(7):2224-2227. doi:10.18203/2320-1770.ijrcog20162098
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. *J Pharm Biomed Sci.* 2012;16(7):1-3.
10. 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(1):15-20. doi:10.18203/2320-1770.ijrcog20164499
11. Gaddagi RA, Chandrashekhar AP. A clinical study of ectopic pregnancy. *J Clin Diagn Res.* 2012;6(5):867-869.
12. Shivakumar HC, Umashankar KM, Ramaraju HE. Analysis of forty cases of ectopic pregnancies in tertiary care hospital in south India. *Indian J Basic Appl Med Res.* 2013;3(1):235-241.
13. 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(7):2210-2214. doi:10.18203/2320-1770.ijrcog20162095
14. Rakhi MP, Nupur H, Agarwal A, Makkar P, Fatima A. Ectopic pregnancy: a devastating catastrophe. *Sch J Appl Med Sci.* 2014;2(3A):903-907.
15. 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. *Int Arch Integr Med.* 2016;3(1):90-96.
16. Jophy R, Thomas A, Mhaskar A. Ectopic pregnancy 5 years experience. *J Obstet Gynecol India.* 2002;52(4):55-58.
17. 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(9):844-849.
18. 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(2):147-154.
19. Simsek Y, Ay MO. Analysis of ectopic pregnancies admitted to emergency department. *Turk J Emerg Med.* 2015;15(4):151-154. doi:10.1016/j.tjem.2016.02.008
20. Walker JJ. Ectopic pregnancy. *Clin Obstet Gynecol.* 2007;50(1):89-99. doi:10.1097/GRF.0b013e31802f4f79

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