

## A CROSS SECTIONAL STUDY ON ECTOPIC PREGNANCY

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### Abstract

**Background:** Ectopic pregnancy is implantation of fertilised ovum outside uterine cavity. Ruptured ectopic pregnancy is a medical emergency with increased morbidity and mortality. It is associated with several risk factors. This study will give us an idea about its distribution in population, associated risk factors, presentation, morbidity and mortality associated with ectopic pregnancy. **Material and Methods:** This is a prospective study of one-year duration with sample of 120 cases of suspected ectopic pregnancy conducted in our department. Detailed data about surgical, gynaecological, obstetrics, contraceptive, infection histories, demographic characteristics, symptoms were collected and statically analysed. **Results:** Out of 120 patients 9 cases were found to be unruptured. The incidence was maximum in the age group of 26-35 years (65.8%). Risk factors were Tubectomy (11.7%), D and C (12.5%), PID (5%), previous ectopic (0.8%), IUCD (1.7%). 44.2% received more than one-pint blood transfusion as a part of treatment. 83.3% patient had acute presentation and 93.3% presented as pain abdomen. Post laparotomy 11.7% had HDU admission and 8.3% as CICU admission. **Conclusions:** The incidence of ectopic pregnancy has been on the rise. Even though there are tools for early diagnostic such as serum beta HCG, Transvaginal scan, a surgeon has to be ectopic minded as most of the cases are surgical emergencies. With early diagnosis and timely intervention one can enhance the chance of maternal survival.

## INTRODUCTION

Ectopic pregnancy (EP) is a condition presenting as a major health problem for women of childbearing age.<sup>[1]</sup> Worldwide the ectopic pregnancy accounts for 1-2% of all pregnancies, and it is a thoughtful cause of maternal morbidity and mortality.<sup>[2,3]</sup> Any women in reproductive age group with lower abdominal pain and vaginal bleeding often raises the suspicion of ectopic pregnancy but sometimes women may present with nonspecific symptoms unaware of ongoing pregnancy and can also present with hemodynamic shock.<sup>[3]</sup> There are many risk factors for ectopic pregnancy, including prior ectopic pregnancy, history of infections in the reproductive system, multiple sexual partners, miscarriage, induced conception period, current intrauterine contraceptive device (IUCD) use, prior caesarian section (CS), and cigarette smoking at the time of conception are all factors to consider.<sup>[4]</sup> Despite these insights, much remains to be learned about these factors. The current study was designed to study

clinical presentations, identify potential risk factors and to evaluate the contribution of the risk factors associated with EP, to study associated maternal morbidity and mortality and various treatment modalities with respect to ectopic pregnancy in women, attending a tertiary care health centre, SCB Medical College, Cuttack. It will help implement a risk-reduction counselling program before conception, which will help us screen high-risk patients and further reduce and manage EP.

## MATERIALS AND METHODS

The study was a hospital based cross-sectional study of ectopic pregnancy patients, conducted at tertiary care hospital SCB Medical college, Cuttack, Odisha over a period of one year (Aug 2022-July 2023), convenient sampling method was used to select the study subjects. A total of 120 study subjects were selected during the study period.

### Study population

**Inclusion Criteria:** Those coming with symptoms of ectopic pregnancy and confirmed with laparotomy.

**Exclusion Criteria:** patients presented with symptoms of ectopic pregnancy but laparotomy was found to be negative.

### Study instruments

A questionnaire was prepared and pretested with 20 samples in order to test the feasibility, reliability and validity of the questions.

Necessary modifications were made accordingly in the questionnaire and the final questionnaire was prepared for the study.

### Data collection and analysis

Data was collected using the study instrument from the ectopic pregnancy patients reported to LR & OPD of O&G dept of SCB MCH fulfilling the inclusion criteria. After explaining the purpose of study informed consent was obtained from the patient or her close relative in case of unconscious patient. Data includes the sociodemographic profile, risk factors, signs and symptoms, obstetric history of the study population were recorded from the patient or relatives or bed head tickets. The data regarding therapeutic and surgical history were collected from the study population, along with this post-operative complication history were recorded from bedside in visits.

Data was analysed using IBM SPSS version 16.0. All the categorical variables were presented as frequencies and percentages and correlation test was applied for the quantitative variable. The criterion for statistical significance was set at the value of  $P < 0.05$ .

## RESULTS

This study included 120 cases of ectopic pregnancy during one year of study period who were observed and treated. The maximum number of cases were of age group 26-35 comprising of 65.8% followed by 25% in 16-25 yr age group. About 75% belong to rural area and 25% came from urban area. 43.3% of cases were multiparous with parity more than 2 and 38.3% were with parity 1. So amongst them 85.8% were multigravida. There was no abortion history in 68.3% cases and in mode of delivery of last child birth was vaginal delivery in 57.5% cases whereas 24.2% were previous caesarean section and rest were nulliparous.

The study showed that there was no risk factor in 82 (68.3%) cases, D&C in 15 (12.5%), with history of tubectomy in 14 cases (11.7%), PID in 6 cases (5%), IUCD in 2 cases (1.7%). [Table 1]

Out of 120 cases, all were UPT positive. 60 cases (50%) had paracentesis positive, in 25 cases (20.8) was negative and in rest cases it was not done. During laparotomy amongst 120 cases tubal rupture was found in 101 cases (84.1%), ruptured ovarian ectopic in 5 cases (4.2%), ruptured cornual pregnancy in 5 cases (4.1%), unruptured tubal ectopic in 5 cases (4.2%), unruptured ovarian (1.7%) and unruptured cornual ectopic (1.6%) 2 cases each. In this study 53 cases (44.2%) received 2 or more blood transfusions; 47 cases (39.2%) had one-unit blood transfusion whereas 20 cases (20%) did not require any blood transfusion. On histopathology report maximum were tubal gestation 91 cases (71.8%), ovarian 7 cases (5.8%), cornual 6 cases (5%) and rest cases i.e. 16(13.3%) reports were not available. post laparotomy out of 120 cases, 78 cases (65%) received injection iron sucrose for correction of anemia due to blood loss. [Table 2]

Most of the cases i.e. 100 out of 120 (83.3%) had acute presentation rest 20 cases (16.7) had chronic presentation. The most common presentation is abdominal pain in 112 (93.3%) patients followed by amenorrhoea 80(66.7%), bleeding per vagina in 46 cases (38.3%). Other symptoms were giddiness, nausea and vomiting, syncopal attacks in 32 (26.7%) cases. Out of 120 cases 62 cases (51.7%) had shock index  $< 1$  and 58 cases (48.3%) had  $\geq 1$  shock index. In 101 cases (84.17%) beta HCG could not be done because of acute presentation and in rest 19 cases (15.3%) it was sent. This study showed the most common site of rupture was ampullary 68(56.7%) cases, followed by isthmic 27 cases (22.5%), ovarian rupture 7(5.8%) cases, corneal and fimbrial 6 cases (5%) each, interstitial and angular 3 cases (2.5%). Rupture on right side 61 cases (50.8%) was more common than left side 59(49.2%) though the difference is not much significant. Hemoperitoneum was common intraoperative finding in ruptured ectopic cases. The mean amount of hemoperitoneum was found to be 1221ml which ranges from 0 to 3500ml. in 73 cases (60.8%) the amount of hemoperitoneum is less than the mean but in 47 cases (39.2%) it was more than the mean value. [Table 3]

In the study post laparotomy about 94 cases (78.35%) did not have any complication, 14 (11.4%) required HDU admission, 10 cases (8.3%) required CICU admission, 1 case (0.8%) each had sepsis and bowel injury. [Table 4]

6) The below image is scatter plot which shows correlation between two quantitative variables such as shock index and hemoperitoneum. It is found to be significant with correlation coefficient 0.283( $p < 0.05$ ).

**Table 1: Distribution of study population according to Sociodemographic profile and obstetric history (n=120)**

Sociodemographic and obstetric profile	Frequency (N)	Percentage (%)
Age		
< 15	0	0
16-25	30	25
26-35	79	65.8
36-45	10	8.3

≥ 46	1	0.8
<b>Residence</b>		
Rural	90	75
Urban	30	25
<b>Parity</b>		
Nulliparous	22	18.3
1	46	38.3
≥2	52	43.3
<b>Gravida</b>		
1	17	14.2
≥2	103	85.8
<b>Abortion</b>		
0	82	68.3
1	25	20.8
≥2	13	10.8
<b>Living</b>		
0	24	20
1	45	37.5
≥2	51	42.5
Mode of delivery of last child		
<b>LSCS</b>	29	24.2
<b>NVD</b>	69	57.5
<b>Nullipara</b>	22	18.3

**Table 2: Distribution of study population according to risk factors (n=120)**

Risk factors	Frequency (N)	Percentage (%)
No	82	68.3
Dilatation & curettage	15	12.5
IUCD	2	1.7
PID	6	5
Previous ectopic pregnancy	1	0.8
Tubectomy	14	11.7

**Table 3: Distribution of study population according to therapeutic and Surgical procedures (n=120)**

Therapeutic & Surgical Procedures	Frequency (N)	Percentage (%)
<b>UPT</b>		
Positive	120	100
negative	0	0
<b>Paracentesis</b>		
Positive	60	50
Negative	25	20.8
Not done	35	29.2
<b>LAP finding</b>		
Ruptured cornual ectopic	5	4.1
Ruptured ovarian ectopic	5	4.2
Ruptured tubal ectopic	101	84.1
Unruptured cornual ectopic	2	1.6
Unruptured ovarian ectopic	2	1.7
Unruptured tubal ectopic	5	4.2
<b>BT</b>		
0	20	16.7
1	47	39.2
≥2	53	44.2
<b>HP Study</b>		
Cornual Gestation	6	5
Ovarian Gestation	7	5.8
Tubal Gestation	91	75.8
NA	16	13.3
<b>Received injectable iron</b>		
Yes	78	65
No	42	35

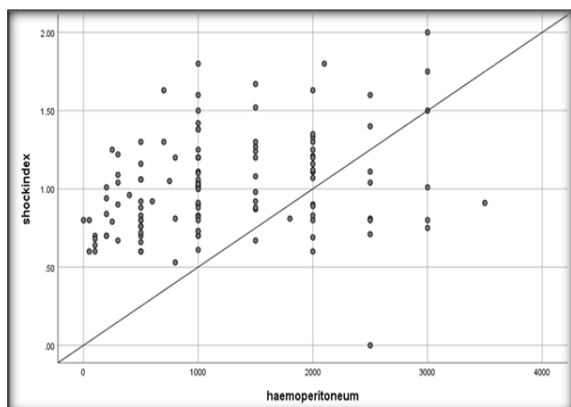
**Table 4: Distribution of study population according to Presenting symptoms and signs (n=120)**

Presenting Signs & symptoms	Frequency (N)	Percentage (%)
<b>Presentation</b>		
Acute	100	83.3
Chronic	20	16.7
<b>Amenorrhoea</b>		
Yes	80	66.7
<b>Pain abdomen</b>	112	93.3
<b>BPV</b>	46	38.3

Others	32	26.7
Heart Rate		
< 100	73	60.8
> 100	47	39.1
Shock index		
< 1	62	51.7
≥ 1	58	48.3
Sr.HCG		
Done	19	15.83
Not done	101	84.17
Site of rupture		
Ampullary	68	56.7
Angular	3	2.5
Cornual	6	5
Fimbrial	6	5
Interstitial	3	2.5
Isthmic	27	22.5
Ovarian	7	5.8
Side of rupture		
Right	61	50.8
left	59	49.2
Amount of hemoperitoneum		
Mean-1221		
Range -0 to 3500		
< mean-	73	60.8
≥ mean	47	39.

**Table 5: Distribution of study population according to post Laparotomy complication findings**

Post OP Complication	Frequency	Percentage
CICU Admission	10	8.3
HDU Admission	14	11.7
Sepsis	1	0.8
Bowel injury	1	0.8
NAD	94	78.3



**Figure 1: Scatter plot which shows correlation between two quantitative variables such as shock index & hemoperitoneum. It is found to be significant with correlation coefficient 0.283 ( $p < 0.05$ ).**

shockindex	Pearson Correlation	1	.283**
	Sig. (2-tailed)		.002
	N	120	120
haemoperitoneum	Pearson Correlation	.283**	1
	Sig. (2-tailed)	.002	
	N	120	120

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Figure 2: Correlation coefficient is 0.283.**

## DISCUSSION

Ectopic pregnancy can occur in any reproductive age group. In the present study, 65.8% of patients are in age group of 26-35 years. Panchal et al. conducted a study which showed 71.66% patients were in age group of 21-30 years of age.<sup>[5]</sup> Poonam et al showed maximum incidence in 26-30 years.<sup>[6]</sup> A study by Rose et al found maximum cases in age group of 21-30 years (43%).<sup>[7]</sup>

In the present study, maximum cases 85.8% were multigravida. In Panchal et al. study 80% of patients were multiparous.<sup>[8]</sup> In study of Rashmi A. Gaddagi

& Chandrashekar et al., 27% were nulliparous, 10.8% were primiparous and the rest (62.2%) were multiparous.<sup>[9]</sup>

In present study, cases with history of abortion were 31.6%. Rose et al reported previous abortion as a risk factor in 25.8%.<sup>[7]</sup> Tubal dysfunction or damage following abortion induced or otherwise appears to be a prime factor in these cases.

In this study 1 (0.8%) case had previous history of ectopic pregnancy. In Rose et al also reported 3.2% of repeat ectopic pregnancy.<sup>[7]</sup> As tubal diseases are usually bilateral so there is a high chance of recurrence of ectopic pregnancy.

In the present study, there was no risk factor in 82 (68.3%) cases and the most common risk factor was history D&C seen in 12.5% of cases, PID accounts as risk factor in 5% cases.

In studies by Savitha Devi, Rose et al. and Rashmi A. Gaddagi & Chandrashekhar, the incidence of PID as a risk factor is 25%, 34.4% and 8.1% respectively.<sup>[7,10,11,12]</sup> Levin et al showed that the risk of ectopic pregnancy is increased in women with history of PID.<sup>[13]</sup>

In this study, IUCD was used by 2 patients (1.7%). Marchbanks et al showed 1.6% incidence of ectopic pregnancy in progestin-only contraceptive users.<sup>[14]</sup> Similarly an incidence of 11.9%, 7.69% and 33% ectopic pregnancy were found in relation to the use of intrauterine devices by Marchbanks et al, Savitha Devi et al and Wills and Mohanambal respectively.<sup>[12,14]</sup>

Also, in their study 97.3% of patients had positive urine pregnancy test compared to this study where 100% of patients had urine pregnancy test positive.

All the cases were diagnosed either by clinical findings or by ultrasound and were surgically treated by laparotomy.

In this study, 92.5% cases were ruptured ectopic pregnancy. In 84.1% cases of fallopian tubes were ruptured. There were 5 cases of cornual and ovarian pregnancy each. Wills and Mohanambal reported ruptured cases to be 66%. Unruptured cases accounted for 7.5% in our present study and according to Wills and Mohanambal was 34%.

Blood transfusions were required in 83.4% cases either intra-operatively or post operatively. 65% received injectable iron sucrose for anaemia correction due to acute blood loss.

In this study, 83.3% cases had acute presentation. Presence of shock index more than 1 was found in 58 cases (48.3%). The more extensive and rapid the disturbance, the clearer is the clinical picture. Hence, undisturbed ectopic gestation is likely to be missed in majority of the cases as the clinical features are vague.

Almost 93.3% had pain abdomen as chief complain establishing it as the most common presenting feature. No history of pain abdomen was seen in 8 cases (6.7%), either due to unruptured tubal pregnancy or because of individual differences in the pain threshold. Pendse et al in 3.6% of his cases noted absence of pain.<sup>[15]</sup>

Amenorrhoea was found in 66.7% cases which is comparable to Rose et al,<sup>[7]</sup> and Pendse et al.<sup>[15]</sup> Oumachigui et al showed absence of amenorrhoea in 23% cases as compared to 33.3% in the present series.<sup>[16]</sup>

Vaginal bleeding was present in 38.3% where as it was found to be 65.4% and 66.6% in study by Rose et al,<sup>[7]</sup> and Pendse et al,<sup>[15]</sup> respectively. Other symptoms were giddiness, vomiting and syncopal attacks were also found in some cases. Oumachigui et al reported shoulder pain in 8%, fainting attacks in 18%, vomiting in 31% and urinary symptoms in 12.5%.<sup>[16]</sup>

On laparotomy, there was Ampullary pregnancy in 56.7% cases. Devi S et al and Khera et al and showed it to be 61.53% and 71.7% respectively.<sup>[12,17]</sup>

Pregnancy in Isthmus region was found in 22.5% cases and Khera et al reported it to be 20.75%.<sup>[17]</sup>

Ovarian pregnancy accounted for 5.8% in the present study while it was 1% by the study by Wills and Mohanambal. Cornual and fimbrial pregnancy was found to be 5% cases each in this study.

Out of all the 120 open laparotomies, in 50.8% cases the pathology was on right side and in 49.2% cases on left side suggesting its equal distribution on both the sides.

During laparotomy, hemoperitoneum was a common finding associated with all ruptured ectopic cases of varying volume. The amount of hemoperitoneum was ranging from 0- 3500ml and the mean of them was 1221ml. Out of which in 39.2% cases the amount was more than the mean value.

As ectopic pregnancy is a condition of high morbidity and mortality, 21.6% cases had post laparotomy complications out of which 11.4% had HDU admission, 8.3% had CICU admission, 0.8% had bowel injury and sepsis each.

## CONCLUSION

Although several risk factors for ectopic pregnancy are known, the cause of a large proportion of ectopic pregnancies remains unknown. Our findings are association with previous surgical induced abortion and prior tubal ligation as risk factor for ectopic pregnancy. The incidence increases with increased parity. Most of the patients presented with acute rupture, most common symptom being pain abdomen and in all cases, urine pregnancy test was positive. Most common site of ectopic was tubal ectopic, that too ampullary part. Though the recent trend in the management of ectopic pregnancy is the use of conservative surgical or medical line of management, salpingectomy was the treatment modality for most of the cases in the present study, this was mainly because majority of the cases was referred or they came late to the hospital after the ectopic pregnancy has ruptured (92%).

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