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Original Research Article

## Risk factors and management of ectopic pregnancy

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### ABSTRACT

**Background:** One of the critical and commonest acute abdominal emergencies which a gynaecologist has to manage in day to day practise is ectopic pregnancy. The present study is compilation to know the risk factors and different modalities of medical and surgical management of patients with ectopic pregnancy.

**Methods:** All patients diagnosed of Ectopic pregnancy at Basaveshwar teaching and general hospital and Sangameshwar teaching and general hospital attached to Mahadevappa Rampure Medical College were part of the study, over a period of two years (August 2014 to July 2016). It was a prospective study with pivot tables, graphs and chi square test.

**Results:** In a span of 2 years 50 cases were studied. Maximum age incidence was 21-25 years. Greater incidence was seen in primigravida accounting for 28%. Most patients presented with pain in abdomen (50 cases). Risk factors included previous abortion, contraception history, sterilization history and pelvic surgery. 47 cases underwent laparotomy and 3 cases were managed medically. 66% had tubal rupture and the most common site was ampulla. Post-operative period was uneventful in majority of cases.

**Conclusions:** With the increasing incidence of ectopic pregnancy, screening of high risk cases, early diagnosis and early intervention are required to prevent the maternal deaths and conservation of reproductive health.

**Keywords:** Ectopic pregnancy, Maternal deaths, Salpingectomy

### INTRODUCTION

One of the critical and commonest acute abdominal emergencies which a gynaecologist has to manage in day to day practise is "Ectopic pregnancy". It is a threat to the life of a women and her future fertility which causes mutilation of organs of reproduction. Ectopic pregnancy is a disease of diagnostic surprise as described by Novak, the physician who has ectopic on the brain rarely fails to make the diagnosis when it exists and he will diagnose it often when it's not present.

The term ectopic is comprehensive than extra uterine or tubal pregnancy for it includes all varieties of gestation outside the uterine cavity.

The word ectopic is from Greek; 'EX' and 'TOPOS' meaning "out of place". Following fertilization and fallopian tube transit, the blastocyst normally implants in the endometrial lining of the uterine cavity. Implantation elsewhere is considered ectopic pregnancy.<sup>1</sup> This implantation at an aberrant site is inconducive to growth and development of blastocyst.

It includes all gestations implanted in

- Fallopian tube
- Ovarian pregnancy
- Cervical pregnancy
- Abdominal pregnancy
- Cesarean scar pregnancy.
- Distant sites.

The occurrence of ectopic has been increasing at an alarming rate because of increase in infertility, IVF and sexually transmitted diseases. Different diagnostic modalities continue to evolve for ectopic pregnancy. Application of serial human chorionic gonadotropin beta subunit measurements in combination with ultrasonography has facilitated identification of ectopic pregnancies. Treatment of ectopic pregnancy has evolved from laparotomy to laparoscopy.

The objectives of present study were to study the risk factors associated with ectopic pregnancy and to study the different modalities of medical and surgical management of patients with ectopic pregnancy depending on clinical presentation.

## METHODS

Patients presenting with symptoms suggestive of ectopic pregnancy and found to have ectopic pregnancy on investigations were enrolled in this study after informed consent at Basaveshwar and Sangameshwar teaching and general hospitals attached to Mahadevappa Rampure Medical College, Kalaburgi.

### Inclusion criteria

All diagnosed cases of ectopic pregnancy.

### Exclusion criteria

Intrauterine pregnancies.

All patients with a history of amenorrhea, with history of pain abdomen, per vaginal bleeding, syncope, symptoms and signs of shock, detailed history including age group, parity, risk factors like, use of contraception, any history of infertility and any treatment for the same, history of abortions, details of any pelvic infections, history of tubal sterilization, smoking and previous history of ectopic pregnancy will be taken.

Clinical examination (per abdomen and pelvic examination) will be done. Apart from routine investigations special investigations that will be done include, UPT, ultrasound scan (transabdominal and/or transvaginal),  $\beta$  hCG measurement, culdocentesis will be done. The details of the management will be recorded including surgical procedure and intra operative findings. Patient will be followed up till the duration of hospital

stay for immediate postoperative complications and recovery.

### Statistical analysis

Frequencies charting and Chi Square statistical methods were employed in the present study.

## RESULTS

50 cases were collected from Basveshwar and Sangameshwar teaching and general hospital attached to Mahadevappa Rampure Medical College, Kalaburagi carried out for two years from August 2014 to July 2016.

**Table 1: Ectopic pregnancy in relation to age.**

Age (years)	Frequency	%
<20	4	8.0
21-25	21	42.0
26-30	17	34.0
31-35	8	16.0
Total	50	100.0

In this study, maximum patients were in the age group of 21-25 years (42%), followed by 26-30 years (34%).

**Table 2: Distribution of cases based on gravida.**

Gravida	No. of cases	%
G1	14	28
G2	13	26
G3	13	26
G4	9	18
G6	1	2
Total	50	100

In this study, maximum patients were primigravida (28%), followed by gravida 2 and 3 (26%).

**Table 3: Distribution of cases based on clinical presentation in ectopic pregnancy distribution depending on symptoms.**

Symptoms	No. of cases	%
Abdominal pain	50	100
Amenorrhea	49	98
Bleeding	20	40

Abdominal pain was commonest symptom and present in 50 cases (100%), amenorrhea was present in 49 cases (98%), bleeding per vagina was present in 20 cases (40%).

In the present study 25 cases had risk factors. 11 cases had history of abortion, 5 cases had history of contraceptive use, 4 cases had conceived after infertility treatment, 2 cases had history of sterilization, pelvic surgery was done in 2 cases, 1 case had PID.

**Table 4: Distribution of cases based on risk factors for ectopic pregnancy.**

Risk factors	No. of cases	%
Conceived after infertility treatment	4	16
Contraception failure	5	20
Post Sterilization	2	8
MTP (Dand C)	11	44
Pelvic surgery	2	8
Pelvic inflammatory disease	1	4
Total	25	100

**Table 5: Distribution of cases based on risk factors for ectopic pregnancy in detail.**

Risk factors	No. of cases	%
Conceived after infertility treatment	4	-
Concieved after ICSI	1	4
Ovulation induction	3	12
MTP	11	44
Contraception failure	5	-
IUCD	3	12
Depoprovera	1	4
Progesterone only pill	1	4
Post sterilization	2	-
Tubectomy	1	4
Lap tubectomy	1	4
Pelvic inflammatory disease	1	4
Pelvic surgery	2	-
Lap surgery for ovarian cyst	1	4
RT oophorectomy, appendicectomy	1	4
Total	25	100

In this study 11 cases had history of previous abortion, 4 cases had history of infertility and treated for the same in form of ovulation induction and ICSI (intracytoplasmic sperm injection), 2 cases with failed sterilization (tubectomy and lap tubectomy), 3 cases with IUCD insertion, 2 cases with previous surgery, 2 cases with hormonal contraceptive use, 1 case with PID, 25 cases had no risk factor. Few cases had more than one risk factor.

**Table 6: Management of ectopic pregnancy.**

Procedure	No. of cases	%
Medical	3	6
Surgical	47	94
Unilateral salpingectomy-Left	11	22
Unilateral salpingectomy-Right	21	42
Bilateral salpingectomy	4	8
Right salpingectomy+left tubectomy	4	8
Left salpingectomy+right tubectomy	3	6
Left salphingo- oophorectomy	1	2
Right salphingo-oophorectomy	1	2
Left horn resection	1	2
Right horn repair	1	2
Total	50	100

Most cases had unilateral salpingectomy (32 cases), 4 cases underwent bilateral salpingectomy, 7 cases underwent Ipsilateral salphigectomy with contralateral tubectomy, 2 cases had salphingoophorectomy, 1 had horn resection, 1 had repair of horn, 3 were treated medically. Both medically treated patients lost to follow up.

**Table 7: Site of ectopic pregnancy on laparotomy.**

Site	No. of cases	%
Ampulla	18	38
Infundibulum	11	24
Isthmus	9	19
Cornua/interstitial	7	15
Left horn	1	2
Right horn	1	2
Total	47	100

In this study, more cases were ampullary pregnancy 18 cases (38%), followed by Infundibulum 11 cases (23%), followed by cornual/interstitial 7 cases (15%) and isthmus 9 cases (19%).

## DISCUSSION

In this study, maximum patients were in the age group of 21-25 years followed by 26-30 years. 16% were in the age group 31-35 years, similar to Sanjay P et al 47.5% in 21-25 age group.<sup>2</sup>

**Table 8: Age pattern in ectopic pregnancy.**

Age distribution (years)	Present study	Porwal et al	Samiya et al
<20	8%	5%	-
21-25	42%	47.5%	20%
26-30	34%	25%	55%
31-35	16%	22.5%	16%
36-40	-	-	6%
>40	-	-	2%

Samiya et al found maximum age group of 26-30 years.<sup>3</sup> In the studies of centre for disease control maximum number of women was in the age group of 35-40 years.

**Table 9: Gravida pattern in ectopic pregnancy.**

Gravida	Present study	Porwal et al	Samiya et al
G1	28%	40%	53%
G2	26%	20%	29%
G3	26%	31.5%	10%
G4	18%	7.5%	3.5%
G6	2%	-	2.63%

In this study, maximum patients were Primigravida (28%) followed by gravida 2 and 3(26%). There were 18% of gravida 4. Similarly, Porwalet al and Samiya et al studies primigravida were 40% and 53% respectively.<sup>2,3</sup> According to ICMR multicentric case control study

(1990) of ectopic pregnancy, majority of women were young and had low parity.<sup>4</sup> Precise estimation of the true incidence of ectopic pregnancy is difficult, but the most recent estimate by the CDC is 2% of reported pregnancies.<sup>5</sup>

**Table 10: Clinical presentation of ectopic pregnancy.**

Clinical presentation	Present study	Rashmi	Shetty K et al
Pain abdomen	100%	89.2%	80.6%
Amenorrhoea	98%	75.7%	77.4%
Bleeding per vagina	40%	43.2%	61.3%
Fornices tenderness	92%	70.3%	48.4%
Cervical tenderness	86%	75.7	51.6%

Abdominal pain was the commonest symptom and present in 100%, followed by amenorrhoea in 98%, per vaginal bleeding in 40%. This is similar to study of Rashmi AG and Shradha Shetty K et al in which majority of the cases presented with pain in the abdomen (89.2% of cases and 80.6% cases resp), amenorrhoea (75.7% and 77.4%) and spotting (43.2% and 61.3%) respectively.<sup>6,7</sup> In present study, cervical motion tenderness was seen in 86% and fornix tenderness in 92%.

**Table 11: Risk factors in ectopic pregnancy.**

Risk factors	Present	Samiya et al	Shetty K et al	Porwal et al
Infertility treated	8%	8.77%	3.2%	22.5%
Previous ectopic	-	5.2%	3.2%	5%
Tubal surgery	4%	-	3.2%	10%
IUCD	6%	-	6.4%	5%
D and C	22%	21.05%	29%	-
Pelvic surgery	4%	10.5%	-	-
PID (pelvic inflammatory disease)	2%	10.01%	3.2%	47.5%

The most common risk factor was D and C (MTP) which was seen in 22% which is similar to Samiya et al study with 21.05 % and 29% in Shetty SK et al.<sup>3,7</sup> In present study 8% were infertility treated which is significantly more, similar to Sanjay P et al 22.5%.<sup>2</sup> IUCD insertion history was seen in 6%, tubal surgery and pelvic surgery in 4% cases. The most important risk factors for ectopic pregnancy are a history of tubal surgery, including tubal ligation, prior ectopic pregnancy, and history of pelvic inflammatory disease, intrauterine device (IUD) use, in utero diethylstilbestrol (DES) exposure, are associated with increased risk for ectopic gestation.<sup>8,9</sup>

Up to half of women with ectopic pregnancy will have no identifiable risk factors. Many other risk factors, including smoking and multiple lifetime sexual partners, are weakly associated with ectopic pregnancy overall the percentage of ectopic pregnancies in sterilised women

have reported to be 5-16%.<sup>10-12</sup> An increased incidence of ectopic pregnancy has been reported with use of progestin only contraceptives.<sup>13</sup> Tubal pregnancy is increased following gamete intrafallopian transfer (GIFT) and In-vitro fertilization.<sup>14</sup> Extratubal as well heterotopic tubal pregnancies are also increased after these procedures.<sup>15</sup>

**Table 12: Site of ectopic pregnancy on laparotomy.**

Site of ectopic	Present	Porwal et al	Shetty K et al	Rashmi A
Ampullary	38%	40%	45.2%	69.7%
Isthmus	15%	32.5%	6.5%	3%
Infundibular	24%	5%	22.6%	-
Interstitial	15%	12.5%	19.4%	15%
Heterotrophic	6%	-	6.5%	-
Ovarian	-	-	6.5%	-

Ampullary pregnancy was most common site. In present study it is 38%, similar to Sanjay P et al, Shradha SK et al and Rashmi AG 40%, 45.2%, 69.7% respectively.<sup>2,6,7</sup> In present study infundibular pregnancy was seen in 24% cases, similar to Shradha SK et al it was 22.6%.<sup>7</sup> In present study isthmic and interstitial was 15%, heterotrophic was seen in 10% cases. Incidence of heterotrophic pregnancy varies widely from 1 in 100 to 1 in 30,000 pregnancies. A high index of suspicion can help in timely diagnosis and appropriate intervention.<sup>16</sup> The treatment of a heterotopic pregnancy is laparoscopy/laparotomy for the tubal pregnancy.<sup>17</sup>

**Table 13: Condition of tube on laparotomy.**

Condition of tube	Present	Samiya et al	Rashmi	Shetty K et al
Ruptured	66%	60.5%	78.3%	61.3%
Chronic ectopic	2%	3.5%	-	-
Unruptured	-	35.08%	8.1%	22.5%
Tubal abortion	32%	-	-	12.9%

In present study, tubal rupture was seen in 66%, similar to Samiya et al, Rashmi AG and Shradha SK et al in which it is 60.5%, 78.3%, 61.3% respectively.<sup>3,6,7</sup> Chronic ectopic in present study was 2%, in Samiya et al it was 3.5%.<sup>3</sup> Tubal abortion in 32% cases, in Shradha Shetty K et al it was 12.9%.<sup>7</sup>

**Table 14: Management of ectopic pregnancy.**

Treatment	Present	Porwal et al	Samiya et al	Shetty K et al
Methotrexate	6%	-	0.87%	-
Unilateral salpingectomy	78%	45%	65%	90.3%
Bilateral salpingectomy	8%	12.5%	8%	-
Salphingo oophorectomy	4%	32.5%	-	6.5%

In present study majority of cases unilateral salpingectomy was done 78%, similar to Porwal sanjay et al, Samiya et al and Shetty S et al it was 45%, 65%, 90.3% respectively.<sup>2,3,7</sup> 8% underwent bilateral salpingectomy, in Sanjay P et al and Samiya et al it was 12.5% and 8%.<sup>2,3</sup> Systemic methotrexate is emerging as the standard medical regimen.<sup>18</sup> Early diagnosis is critical with medical therapy. Before the advent of salpingectomy in 1884, ectopic pregnancies were treated expectantly and carried a mortality rate of around 70%.<sup>19</sup> Ylostalo et al described selecting 127 (25%) out of 507 ectopic pregnancies over 3 years for expectant management.<sup>20</sup>

## CONCLUSION

There is an increase in the incidence of ectopic pregnancy and a decrease in maternal mortality due to ectopic pregnancy, during last two decades. The treatment modality also has evolved from radical to conservative surgery and even to medical and expectant management. But in present study maximum cases were managed surgically, as they were brought late with established diagnosis of ruptured ectopic pregnancy. It is therefore important that one should be sensitive to the fact that in reproductive age group any women presenting with pain in the lower abdomen, differential diagnosis should be ectopic pregnancy irrespective of presence or absence of amenorrhea, whether or not she has undergone sterilization. Early identifying of underlying risk factors, diagnosis with the essential aids like transvaginal ultrasound and  $\beta$ -hCG and timely intervention in the form of medical and surgical treatment will definitely help in reducing the morbidity and mortality and to improve reproductive outcome. This study was undertaken for a better understanding of ectopic gestation, its clinical presentation, risk factors and management. Urine pregnancy test was positive in 94% cases, culdocentesis was positive in 68%. Unilateral salpingectomy was done in 32 cases (64%). Haemoglobin on admission was  $<7g$  was seen in 44%. 80% of the cases blood was transfused both intraoperative and postoperatively.

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## REFERENCES

- Cunningham FG, Leveno KJ, Bloom SL, Spong CY, Dashe JS, Hoffman BL et al. Williams obstetrics. 24<sup>th</sup> ed. Mc Graw Hill Education. Chapter 19. 2014:377.
- 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).
- Mufti S, Rather S, Mufti S, Rangrez RA, Wasifa K. Ectopic pregnancy: an analysis of 114 cases. JK-Pract. 2012;17(4):20-3.
- ICMR task force project 1990. Multicentric case control study of ectopic pregnancy. J Obstet Gynecol India. 1990;40:425-430.
- Centers for Disease Control and Prevention (CDC). Ectopic pregnancy--United States, 1990-1992. MMWR. 1995;44(3):46.
- Gaddagi RA, Chandrashekhar AP. A clinical study of ectopic pregnancy. J Clin Diag Res. 2012;6(5):867-9.
- Shetty S, Shetty A. A clinical study of ectopic pregnancies in a tertiary care hospital of Mangalore India. Innov J Med Health Sci. 2014;4(1):305-9.
- Murray H, Baakdah H, Bardell T, Tulandi T. Diagnosis and treatment of ectopic pregnancy. CMAJ. 2005;173:905-912.
- Ankum WM, Mol BW, Van der Veen F, Bossuyt PM. Risk factors for ectopic pregnancy: a meta analysis. Fertil Steril. 1996;65:1093-9.
- Buckley RG, King KJ, Disney JD, Gorman JD, Klausen JH. History and physical examination to estimate risk of ectopic pregnancy: validation of a clinical prediction model. Ann Emerg Med. 1999;34(5):589-94.
- Dart RG, Kaplan B, Varaklis K. Predictive value of history and physical examination in patients with suspected ectopic pregnancy. Ann Emerg Med. 1999;33:283-90.
- Cheng MC, Wong YM, Rochat RW, Ratnam SS. Sterilisation failures in Singapore an examination of ligation techniques and failure rates. Stud Fam Plann. 1977;8:109-115.
- Ory HW. Ectopic pregnancy and intrauterine contraceptive devices: new perspectives. The Women's Health Study. Obstet Gynecol. 1981;57(2):137-44.
- Coste J, Job-Spira N, Fernandez H, Papiernik E, Spira A. Risk factors for ectopic pregnancy: a case-control study in France, with special focus on infectious factors. Am J Epidemiol. 1991;133(9):839-49.
- Kendrick JS, Atrash HK, Strauss LT, Gargiullo PM, Ahn YW. Vaginal douching and the risk of ectopic pregnancy among black women. Am J Obstet Gynecol. 1997;176(5):991-7.
- Govindarajan MJ, Rajan R. Heterotopic pregnancy in natural conception. J Hum Reprod Sci. 2008;1(1):37-8.
- Ectopic Pregnancy. Text book of Williams Obstetrics. Multifetal Ectopic Pregnancy. 21<sup>st</sup> ed. Chapter 34. 2003:888-9.
- Stabile I, Grudzinkas JG. Ectopic pregnancy whats new? Progress Obstet Gynecol. 1994:281-310
- Parry JS. Extrauterine pregnancy: Its causes, species, pathologic anatomy, clinical history, diagnosis, prognosis, and treatment. Philadelphia, Lea and Febiger, zit. Leach RE, Ory SJ (1989) Modern management of ectopic pregnancy. J Reprod Med. 1876;34:324-38.
- Ylöstalo P, Cacciatore B, Sjöberg J, Kääriäinen M, Tenhunen A, Stenman UH. Expectant management of ectopic pregnancy. Obstet Gynecol. 1992;80:345-8.

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