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Research Article

## Ectopic pregnancy: a comprehensive analysis of risk factors and management

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### ABSTRACT

**Background:** Ectopic pregnancy is the most life threatening emergency in pregnancy leading to maternal death. Ectopic pregnancy jeopardizes the wish of attainment of motherhood also. Increase in incidence of pelvic inflammatory disease (PID), previous history of D and C and abortion, previous abdominal surgeries and use of assisted reproductive techniques are the various risk factors for ectopic pregnancy. The objective of this study was to assess the demographic profile, risk factors, clinical presentation and surgical management of ectopic pregnancy at a tertiary care centre.

**Methods:** A prospective, longitudinal and observational study was conducted in the department of obstetrics and gynaecology, Umaid Hospital, Dr. SN Medical College, Jodhpur during a period of one year from October 2014 to September 2015. 80 cases of ectopic pregnancy admitted in the hospital were analyzed in terms of demographic profile, risk factors, clinical presentation, management, morbidity, mortality. Finally all collected material and data were analyzed statistically to draw various informative conclusions.

**Results:** Most common age and parity affected by ectopic pregnancy were 21-30 years (63.75%) and para 1-3 (72.50%) respectively. No age and parity were immune to ectopic pregnancy. More than one clinical feature was present in most of the patients. Most common site of ectopic pregnancy was ampullary region (51.25%) of the tube. Salpingectomy was the most common surgical procedure performed (75%). Few patients had more than one complication. 29 cases had no complication. No maternal mortality occurred during this period. Around 50% women received blood transfusion.

**Conclusions:** Ectopic pregnancy is a life-threatening condition occurring in women all over the world. As the incidence of ectopic pregnancy increases, ways and means have to be found to reduce the associated morbidity and mortality and to preserve future fertility.

**Keywords:** Ectopic pregnancy, Pelvic inflammatory disease, Salpingectomy

### INTRODUCTION

Attainment of motherhood is the most cherished desire of every female. An ectopic pregnancy jeopardizes this wish and may permanently impair her reproductive capacity. Pregnancy is a perfection of marital bliss but no perfection is so absolute that impurity does not pollute so is the ectopic pregnancy. For a young maid whose womb is desirous of an offspring, advanced extra-uterine

pregnancy is but an illaned opportunity which kills life or else its quality. Ectopic pregnancy is the most common life threatening emergency in early pregnancy. It is still a major health problem among the women of child-bearing age in our country and continues to be an important cause of morbidity and mortality in women.<sup>1</sup> The rate of ectopic pregnancy is 11 per 1000 pregnancies, with a maternal mortality of 0.2 per 1000 estimated ectopic pregnancies.<sup>2</sup> The marked increase was attributed to a number of

factors including an increase in incidence of pelvic inflammatory disease (PID), smoking in women of reproductive age, use of assisted reproductive techniques and general awareness of the condition facilitated by development of early pregnancy assessment units (EPAUs). Improvement in non-invasive diagnostic methods, such as sensitive pregnancy tests in urine and serum and high-resolution trans-vaginal sonography, has enabled early diagnosis of ectopic pregnancy.<sup>3-5</sup> As a consequence, the clinical presentation of ectopic pregnancy has changed from a life-threatening disease, necessitating emergency surgery, to a benign condition in frequently asymptomatic women for whom nonsurgical treatment options are available.<sup>3-5</sup> As ectopic pregnancy has variable presentations from asymptomatic to life threatening condition, the aim of this study was to determine the clinical profile of patients presenting with ectopic pregnancy and to determine the risk factors, so as to make recommendations on interventions to reduce the incidence of this life-threatening condition.

## METHODS

The present prospective, longitudinal and observational study was conducted in the department of obstetrics and gynaecology, Umaid hospital, Dr. SN Medical College, Jodhpur during a period of one year from October 2014 to September 2015. 80 cases of ectopic pregnancy admitted in the hospital were analyzed in terms of demographic profile, risk factors, clinical presentation, management, morbidity, mortality and associated risk factors. Finally all collected material and data were analyzed to draw various informative conclusions.

## RESULTS

The most common age group and parity affected were 21-30 years (63.75%) and para 1-3 (72.50%) but none of the age and parity was immune to ectopic pregnancy. 80.00% women were Hindu and 57.50% women belong to rural dwelling (Table 1).

**Table 1: Demographic picture of patients.**

AGE (years)	<20	20-25	26-30	31-35	>35
	9 (11.25%)	29 (36.25%)	22 (27.50%)	14 (17.5%)	6 (7.50%)
Parity	0	1-3	4-7	>7	
	12 (15%)	58 (72.50%)	10 (12.50%)	0 (0.0%)	
Religion	Hindu	Muslim	Others		
	64 (80%)	14 (17.50%)	2 (2.50%)		
Residence	Rural	Urban			
	46 (57.50%)	34 (42.50%)			

**Table 2: Distribution of cases according to clinical presentation.**

Symptoms	No. of cases	Percentage
Amenorrhea	57	71.25
Pain abdomen	69	86.25
Bleeding per vaginum	46	57.50
Fainting	18	22.50
Shoulder pain	5	6.25
Bladder symptoms	3	3.75
Fever	6	7.50
Vomiting	10	12.50
Passing of fleshy cast	3	3.75

More than one clinical feature was present in most of the patients. Amenorrhea (71.25%) and pain abdomen (86.25%) were the common presenting symptoms while tenderness in fornices (60%), tender cervical movement (52.50%) and Fullness in fornices (51.25%) were the common signs. 13.75% women presented in shock. 67.50% patients presented with ruptured ectopic pregnancy (Table 2 and Table 3).

**Table 3: Distribution of cases according to clinical signs in ectopic pregnancy.**

Clinical sign	No. of cases	Percentage
Shock	11	13.75
Abdominal distension	17	21.25
Abdominal tenderness	30	37.50
Abdominal mass	3	3.75
Cervical movement tenderness	42	52.50
Fullness in fornices	41	51.25
Tenderness in fornix	48	60.00
Adnexal mass	14	17.50

The most common risk factor found was PID. It was present in 20 (25.00%) cases of ectopic pregnancy. History of D and C and previous abdominal surgery were other common risk factor. Four cases had a previous ectopic pregnancy. In 18 (22.50%) patients no risk factor was present. Relative risk after previous one ectopic pregnancy was 5.00% (Table 4).

The most common site of ectopic pregnancy was tubal (93.75%) of which ampullary region of the tube was most

commonly affected. Rudimentary horn pregnancy was seen in 2 cases. Two cases of ovarian pregnancy and one case of secondary abdominal pregnancy was seen (Table 5).

**Table 4: Distribution of cases according to predisposing risk factors.**

Predisposing risk factor	No. of cases	Percentage
PID	20	25.00
TB	2	2.50
MTP	9	11.25
Abortion	17	21.25
Puerperal sepsis	10	12.50
Infertility	6	7.50
IUCD	8	10.00
OCP	7	8.75
Sterilization operation	9	11.25
D and C	18	22.50
Previous abdominal surgery LSCS	15	18.75
Previous ectopic pregnancy	4	5.00

**Table 5: Distribution of cases according to site of ectopic pregnancy.**

Site	No. of cases	Percentage
Tubal ampullary	41	51.25
Tubal isthmic	20	25.00
Tubal infundibulum	13	16.25
Tubal interstitial	1	1.25
Ovarian	2	2.50
Rudimentary horn	2	2.50
Abdominal	1	1.25

Conservative surgery in form of partial salpingectomy and milking of the tube was done in 10(12.50%) cases. Radical surgery was done in 70 (87.50%) cases. The most commonly performed operation was unilateral salpingectomy. It was done in 60 (75.00%) patients (Table 6).

**Table 6: Distribution of cases according to management.**

Site	No. of cases	Percentage
Partial Salpingectomy	8	10.00
Unilateral salpingectomy	60	75.00
Unilateral salpingoophorectomy	4	5.00
Unilateral oophrectomy	2	2.50
Extraction of IUD baby with excision of rudimentary horn	2	2.50
Milking of tube	2	2.50
Total abdominal hysterectomy with bilateral salpingo-oophrectomy	1	1.25
Laparotomy followed by extraction of live child	1	1.25

**Table 7: Distribution of cases according to maternal morbidity**

	No. of cases	Percentage
Anaemia	40	50.00
Shock	11	13.75
Fever	6	7.50
Paralytic ileus	1	1.25
UTI	3	3.75
Wound infection	1	1.25
ARDS	1	1.25

Pallor was seen in 50.00% cases. 29 cases had no complication. Few patients had more than one complication. No maternal mortality occurred during this period (Table 7).

Blood transfusion was required in 40 (50.00%) cases. 33 (34.37%) patients received 1-2 units of blood. Only 1 patient needed 6 units blood. Haemoperitoneum was present in 74 (92.50%) cases. Maximum patients 46 (57.5%) had a haemoperitoneum less than 500 ml. In 6 (7.50%) cases about 1500 or more blood was found in the peritoneal cavity (Table 8).

**Table 8: Distribution of cases according to haemoperitoneum and blood transfusion**

Amount of haemoperitoneum	Absent	<500 ml	500-1000 ml	1000-1500 ml	>1500ml	
	6 (7.50%)	46 (57.50%)	18 (22.50%)	4 (5.00%)	6 (7.50%)	
Blood transfusion	Not received	1 unit	2 unit	3 unit	4 unit	6 unit
	40 (50.00%)	14 (17.50%)	18 (22.50%)	5 (6.25%)	2 (2.50%)	1 (1.25%)

## DISCUSSION

Ectopic pregnancy is a common obstetrical disorder in early pregnancy all over the world that remains an

important cause of maternal morbidity and mortality. 80 cases of ectopic pregnancy, those were surgically managed, were analyzed over one year of period. In our study ectopic pregnancies were encountered in women

between ages 18 to 40 years. Highest incidence of ectopic pregnancy was found in the age group of 21-30 years (63.75%) and minimum incidence was found in age group >35 years (7.50%). It shows that reproductive age group is more prone to ectopic pregnancy. It is because increase incidence of sexually transmitted diseases and pelvic inflammatory diseases in this age group as well as efficacy of antibiotic treatment for PID. Most common age group involved was 21-30 years for ectopic pregnancy as reported by Mandelkar et al, Vyas and Vaidya et al, A Panty et al, Premlata M et al.<sup>6-9</sup>

Highest incidence of ectopic pregnancy was in para 1-3 (72.50%) and lowest incidence in para 4-7 (12.50%). Twelve patients were nulliparous. It was found more in Para 1-3 because of increased use of intra uterine contraceptive devices for births spacing and increased tubal ligation in these patients as this is the time for small family norm, early marriage, and early completion of family and use of family planning methods. These findings correlate with the observations of Pendse et al, Jophy R et al, Premlata M et al where average parity was found to be 2-3.<sup>9-11</sup> Whereas Majhi AK et al, Panty A et al found maximum incidence in nuliparous.<sup>8,12</sup>

Pain abdomen was the most common complaint in 86.25% cases. Its severity ranged from mild ache to cramp to a sudden, sharp pain which was generally localized to lower abdomen. This observation is compatible with observation of most of the author's like Gupta et al, Vyas and Vaidhya, Majhi AK et al, AO Lgwegbe et al and Premlata M et al.<sup>7,9,12-14</sup> However lower figures were reported by Choudhary R and Pendse.<sup>10,15</sup>

Amenorrhea was present in 57 (71.25%) of cases, the duration varying from 5 weeks to 9 months. These observation are in accordance with those of Pendse, Gupta et al, Vyas and Vaidya, Jophy et al and Majhi AK et al.<sup>7,11-13</sup> Higher figures were given by Premlata M et al.<sup>9</sup>

On bimanual per vaginal examination painful cervical movement was found in 52.50% cases. It was because of recently effused blood in the pouch of douglas. These findings were compatible with finding of Jophy et al, Gupta et al.<sup>11,13</sup> Higher figures were given by Vyas and Vaidya, Pendse, Majhi AK et al and Premlata M et al.<sup>7,9,10,12</sup>

Fullness in fornices was found in 41 (51.25%) cases. It was because of gradual disintegration of tubal wall followed by slow leakage of blood into the tubal lumen and peritoneal cavity. This gradually trickling blood collects in the pelvis, more or less walled off by adhesions resulting in pelvic hematocele. Similar observations were reported by Pendse and Vyas and Vaidya.<sup>7,10</sup>

Forniceal tenderness was found in 48 (60.00%) cases in present series. Slight higher incidence were observed by Vyas and Vaidya and A Panty et al.<sup>7,8</sup>

The most common etiological factor was pelvic inflammatory disease. It was found to be present in 20 (25.00%) cases this observation is in consonance with findings of Vyas and Vaidya and Jophy R et al, Abubakar A Panty et al, Premlata M et al.<sup>7,9,8,11</sup> Pelvic inflammatory diseases are responsible for causing peritubal adhesions, partial closure of lumen, intra-tubal adhesions, diverticuli and cysts. In the diverticuli the myoelectrical activity is diminished and limited to that segment of the tube only and therefore the fertilized ovum gets trapped in it. Lower incidence was reported by Pendse and Gupta et al.<sup>10,13</sup>

History of D and C was present in 18 (22.50%) cases. The indication was incomplete abortions, DUB etc. These observations are compatible with findings of Gupta et al, Vyas and Vaidya and Premlata M et al.<sup>7,9,13</sup> Improper hygiene and sepsis while performing D and C can lead to PID, increasing the risk of ectopic pregnancy. History of previous abdominal surgery was present in 15 (18.75%) patients. Similar finding have been reported by Majhi AK et al.<sup>12</sup> Lower incidence were reported by Gupta et al, Pendse, Vyas and Vaidya respectively.<sup>7,10,13</sup> The cause of ectopic pregnancy following abdominal surgery was observed by other authors to be peritubal adhesions and scarring which were found to be responsible for the occurrence of ectopic pregnancy.

Currently ultrasound and serum biomarkers are used by clinicians for early diagnosis. To conclude patients having clinical features of ectopic pregnancy on ultrasound scan as positive adnexal mass with or without gestational sac, with or without fetal heart, or presence of adnexal mass along with haemoperitoneum along with positive pregnancy test assures diagnosis of ectopic pregnancy. In our study 82.50% patients present with rupture ectopic pregnancy so early diagnosis and management is very important for decreasing the mortality and morbidity related with ectopic pregnancy.

Ectopic pregnancy was identified in the fallopian tube in 75 (93.75%) of cases. In 2 cases pregnancy was found in rudimentary horn. Similar findings were reported by Vyas and Vaidhya, Majhi AK et al and Premlata M et al.<sup>7,9,12</sup> Tubal ectopic pregnancies were ampullary in 51.25%, isthmic in 25.00%, fimbrial in 16.25% and interstitial in 1.25% cases. Similar findings are reported Vyas and Vaidya and A Panty et al.<sup>7,8</sup>

In our study 82.50% patients present with rupture ectopic pregnancy. Haemoperitoneum was absent in 6 (7.50%) cases of the present series. About 57.50% patients had <500 ml blood, 22.50% cases had 500-1000 ml, 5% patients had 1000-1500 ml. 7.50% cases had >1500ml blood in their peritoneal cavity. These finding are similar of those of Jophy et al and Vyas and Vaidya.<sup>7,11</sup> In our study 40 (50%) patients required blood transfusion. Most

(40%) required only one and two unit blood but 8 (10%) patients who had massive haemoperitoneum required  $\geq 3$  units of blood. Gupta et al reported similar findings.<sup>13</sup>

Majority of cases were of ruptured ectopic pregnancies with massive haemoperitoneum, where repair of tube was not possible, hence salpingectomy (75.00%) was the commonest life-saving surgical procedures performed. Similarly various studies also reported that salpingectomy was the commonest operative procedure performed. Similar finding were given by Mandelekar, Vyas and Vaidya and Jophy et al.<sup>6,7,11</sup>

Salpingoophorectomy was performed in 5.00% cases. We should conserve ovary as far as possible because of the assisted reproductive technologies which can be advised to woman in future. The only indication for the removal of ipsilateral ovary along with the tube is when it is diseased or involved in 'ectopic complex', in which hemostasis is best achieved by excising it.<sup>8</sup>

There was a significant degree of morbidity associated with ectopic pregnancy in this study, as shown by the results. This may be attributed to the delay in diagnosis and seeking treatment, and may have contributed to the slightly longer duration of hospitalization recorded. Anemia, which was the commonest complication in this study, was due to excessive blood loss from the rupture site, necessitating blood transfusion. Over the years, however, the therapy for ectopic gestation has evolved from a radical procedure to conservative treatment aimed at the preservation of fertility.

## CONCLUSION

Ectopic pregnancy is a life-threatening condition occurring in women all over the world. As the incidence of ectopic pregnancy increases, ways and means have to be found to reduce the associated morbidity and mortality and to preserve future fertility. With emphasis shifting from radical to conservative therapy; prevention of risk factors and early diagnosis become very important.

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## REFERENCES

1. Vichnin, Michelle. Ectopic pregnancy in adolescents. *Current Opinion in Obstetrics and Gynecology*. 2008;20(5):475-8.

2. National Institute for Health and Clinical Excellence. Ectopic pregnancy and miscarriage: diagnosis and initial management in early pregnancy of ectopic pregnancy and miscarriage. December 2012. Available at <http://guidance.nice.org.uk/>.
3. Ankum WM, Mol BW, Van der Veen F, Bossuyt PM. Risk factors for ectopic pregnancy: a metaanalysis. *Fertil Steril*. 1996;65(6):1093-9.
4. Mol BW, Lijmer JG, Ankum WM, van der Veen F, Bossuyt PM. The accuracy of single serum progesterone measurement in the diagnosis of ectopic pregnancy: a meta-analysis. *Hum Reprod*. 1998;13(11):3220-7.
5. Farquhar CM. Ectopic pregnancy. *Lancet*. 2005;366(9485):583-91.
6. Mandelkara, Krishna UR, Varkey A. Ectopic pregnancy and fertility control. *J Obstet Gynecol Ind*. 1990;40:421-4.
7. Vyas PS, Vaidya P. Epidemiology, diagnosis and management of ectopic pregnancy- an analysis of 196 cases. *Bombay hospital journal*. 2000;42(3):458-65.
8. Panti A, Ikechukwu NE, Lukman OO, Yakubu A, Egondou SC, Tanko BA. Ectopic pregnancy at Usmanu Danfodiyo University teaching hospital Sokoto: a ten year review. *Annals of Nigerian Medicine*. 2012;6(2):87-91.
9. Rakhi, Mital PL, Hooja N, Agarwal A, Makkar P, Andleeb F. Ectopic pregnancy: a devastating catastrophe. *Scholars Journal of Applied Medical Sciences (SJAMS) Sch J App Med Sci*. 2014;2(3A):903-7.
10. Pendse V. Ectopic pregnancy-a review of 110 cases. *J Obstet Gynecol Ind*. 1981;31:100-5.
11. Jophy R, Thomas A, Mhaskar A. Ectopic pregnancy - 5 year experience. *J Obstet Gynecol Ind*. 2002;52:55-8.
12. Majhi AK, Roy N, Karmakar KS, Banerjee PK. Ectopic pregnancy- an analysis of 180 cases. *J Indian Med Assoc*. 2007;105(6):308-12.
13. Gupta U, Sharma P. Ectopic pregnancy-a prospective analysis of 100 cases. *J Obstet Gynecol Ind*. 1992;42:597-600.
14. Igwegbe AO, Eleje GU, Okpala BC. An appraisal of the management of ectopic pregnancy in a Nigerian tertiary hospital. *Ann Med Health Sci Res*. 2013;3(2):166-70.
15. Choudhary NN, ROY. A study of 158 cases of Ectopic pregnancy. *J Obst Gynecol Ind*. 1968;18:364-9.

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