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Original research article

A study of the incidence, clinical presentation, risk factors and morbidity associated with ectopic pregnancy

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Abstract

Background: Ectopic Pregnancy is originated from 'Ektopos', a Greek word. In ectopic pregnancy the fertilized ovum implants outside the endometrial cavity of the uterus[1]. The most common extra uterine pregnancy is the tubal pregnancy in which a fertilized ovum implants in the fallopian tubes. Tubal pregnancies account for 98% of all ectopic gestations. Other sites like ovary, cervix, horn of the uterus, caesarean scar and abdominal cavity are rare[2].

Objectives: To determine the incidence, risk factors, clinical features, morbidity associated with ectopic pregnancy.

Material & Methods:

Study Design: Descriptive Cross sectional study.

Study area: Department of Obstetrics and Gynaecology, Narayana Medical College, Nellore, Andhra Pradesh.

Study Period: June 2017-May 2018.

Study population: Patients suspected of having an ectopic pregnancy.

Sample size: Study consisted a total of 46 subjects.

Study tools and Data collection procedure: Data collection tool was used to collect the different information. Face to face interviews were conducted using data collection tool by the investigator including detailed history taking and relevant physical examination. A detailed history was taken from the patient (if the patient was in shock the history was taken retrospectively). After taking history physical examination was done especially for vital signs, abdominal examination, per vaginal examination, cervical excitation test and culdocentesis when needed. The basic investigations including haemoglobin, renal function test, blood grouping and Rh typing, urine pregnancy test and ultrasound examination were done in all patients. Additional investigations like serum beta hCG, doppler study, CT, MRI were ordered in case of doubtful diagnosis.

Results: Most common risk factor was previous medical abortion (19.5%) followed by IUCD (8.6%), D&C (6.5%), tubectomy (6.5%), OCP's (6.5%), recanalisation (4.3%), appendicectomy (2.2%), Diagnostic Hysterolaparoscopy (2.2%), infertility (2.2%), IUI conception (2.2%), laparoscopy (2.2%), and previous ectopic (2.2%).

Conclusion: Timely diagnosis and management in early pregnancy units with point of care ultrasonography can reduce the morbidity and mortality due to ectopic pregnancy. In conclusion, identifying underlying risk factors, availability of point of care ultrasound and timely intervention will help reduce the morbidity and mortality due to ectopic pregnancy.

Keywords: Ectopic Pregnancy, risk factors, pain abdomen

Introduction

Ectopic Pregnancy is originated from 'Ektopos', a Greek word. In ectopic pregnancy the fertilized ovum implants outside the endometrial cavity of the uterus [1]. The most common extra uterine pregnancy is the tubal pregnancy in which a fertilized ovum implants in the fallopian tubes. Tubal pregnancies account for 98% of all ectopic gestations. Other sites like ovary, cervix, horn of the uterus, caesarean scar and abdominal cavity are rare [2].

Incidence of ectopic pregnancy varies among different countries and also within the same country from place to place. The incidence is around 0.3-0.5% of deliveries in the U.S. and U.K, 4% of deliveries in Ghana and 2.1% of deliveries in Nigeria [3, 4, 5].

In developing countries, many studies have shown that the ectopic gestation case fatality rate was 1%-3%. This is 10 times more than the case fatality rates reported in developed countries [19]. Although no risk factors have been identified in most of the cases with ectopic gestation, studies have highlighted that the awareness of risk factors associated with ectopic gestation helps in identifying the cases early [6].

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Main risk factor is the prior tubal damage due to any cause [6]. Chlamydial infection was found to be the risk factor for 30-50% of all ectopic gestation [7].
Asymptomatic ectopic pregnancies are commonly seen in cases with early and unruptured ectopic gestation. When it ruptures symptoms could be acute or subacute[8]. Classical triad of ectopic pregnancy, occurs only in 50% of the cases [9]. Because of the atypical presentations, the diagnosis remains a challenge to the obstetricians & Gynaecologists.
Ectopic gestation is an important cause of maternal morbidity, presenting with acute symptoms like pelvic pain, bleeding p/v and long term complications like infertility [10]. The incidence of rupture has declined in the last decades due to the availability of quantitative hCG assays, transvaginal sonography and minimally invasive surgeries [11]. Early diagnosis of ectopic pregnancy helps to reduce the incidence of rupture. So, the physician can provide conservative medical and surgical treatments [12].
Since, ectopic pregnancy is an important health problem among the reproductive age group women, the study was aimed to determine the clinical profile of the patients as well as the risk factors associated with ectopic pregnancy.

Objectives: To determine the incidence, risk factors, clinical features, morbidity associated with ectopic pregnancy.

Material & Methods
Study Design: Descriptive Cross sectional study.
Study area: Department of Obstetrics and Gynaecology, Narayana Medical College, Nellore, Andhra Pradesh.
Study Period: June 2017-May 2018.
Study population: Patients suspected of having an ectopic pregnancy.
Sample size: Study consisted a total of 46 subjects.

In a study by Tahmina S *et al*., [13] Ectopic pregnancies were reported in 0.91% of pregnant women.
Formula: $n = z\alpha^2 * pq/d^2$

Where, n is the required sample size.
Z α is the standard normal deviate, which is equal to 1.96 at 95% confidence interval. p is the prevalence in the population of the factor under study.

q = 100-p
d = Absolute precisionp = 0.91%
q = 99.09%
d = 10% is taken as absolute precision = number of samples is to be studied
n = $z\alpha^2 * pq/d^2$
= $(1.96)^2 * 0.91 * 99.09/(3)^2$
= 346.40/9
= 38.48 + 7.696 (20% is added as Non-response rate)
= 46

Sampling technique: Simple Random sampling method.

Inclusion criteria
- All patients suspected of having an ectopic pregnancy.
- Patients who agreed to participate in the study.

Exclusion criteria
- Patients who refused to give informed consent.

Ethical consideration: Institutional Ethical committee permission was taken prior to the commencement of the study.

Study tools and data collection procedure
Data collection tool was used to collect the different information. Face to face interviews were conducted using data collection tool by the investigator including detailed history taking and relevant physical examination. A detailed history was taken from the patient (if the patient was in shock the history was taken retrospectively). After taking history physical examination was done especially for vital signs, abdominal examination, per vaginal examination, cervical excitation test and culdocentesis when needed. The basic investigations including haemoglobin, renal function test, blood grouping and Rh typing, urine pregnancy test and ultrasound examination were done in all patients. Additional investigations like serum beta hCG, doppler study, CT, MRI were ordered in case of doubtful diagnosis. Information regarding

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patient profile, risk factors, sterilisation status, use of other contraceptive methods, presenting symptoms and signs, physical examination, ultrasound findings, types of treatment, per operative findings, no of transfusions, post-operative morbidity and length of hospital stay were noted. Post operatively HPE reports were collected from the pathology department and final diagnosis was made.

Statistical analysis

Data entry was done using M.S. Excel and statistically analysed using Statistical package for social sciences (SPSS Version 16) for M.S Windows. Descriptive statistical analysis was carried out to explore the distribution of several categorical and quantitative variables. Categorical variables were summarized with n (%), while quantitative variables were summarized by mean ± S.D. All results were presented in tabular form and are also shown graphically using bar diagram or pie diagram as appropriate. Categorical variables were tested by chi square test. P-value less than 0.05 was considered to be statistically significant.

Observations & results

In the study period, spreading over 22 months from September 2019 to June 2021, the total number of deliveries in this institution taken into consideration and subjected to statistical analysis are 2500. Out of these number of cases the sample taken for my study of ectopic pregnancy are 46. With this, the data concluded as shown in the forthcoming discussion and observations.

Incidence: The incidence of ectopic pregnancy was 18.4 per 1000 deliveries.

Table 1: Distribution of patients based on the age group

		Frequency	Percent
Age Group	15-20 years	2	4.3%
	21-25 years	14	30.4%
	26-30 years	24	52.2%
	31-35 years	5	10.9%
	36-40 years	1	2.2%
	Total	46	100.0%

Majority of the patients belonged to the age group of 26-30 years (52.2%) followed by 21-25 years (30.4%), 31-35 years (10.9%), 15-20 years (4.3%) and 36-40 years (2.2%).

Table 2: Distribution of patients based on the clinical manifestations

	Frequency	Percent
Amenorrhoea of 5 to 8 weeks	46	100.0%
Pain abdomen	44	95.7%
Bleeding P/V	7	15.2%
Others	11	23.9%

Clinical manifestations were amenorrhoea (100%), pain abdomen (95.7%) and bleeding P/V (15.2%). The period of Amenorrhoea was 5 to 8 weeks.

Pallor was present in 69.6% patients and shock was present in 26.1% patients.

Table 3: Distribution of patients based on the risk factors

		Frequency	Percent
Risk factors	Appendicectomy	1	2.2%
	D&C	3	6.5%
	History of invasive procedure like Diagnostic Hysterolaparoscopy	1	2.2%
	Infertility	1	2.2%
	IUI Conception	1	2.2%
	Laparoscopy	1	2.2%
	Previous medical abortion	9	19.5%
	Previous ectopic	1	2.2%
	Recanalisation	2	4.3%
	Tubectomy	3	6.5%
	Intra Uterine Contraceptive Device(IUCD)	4	8.6%
	Oral contraceptive pills (OCP's)	3	6.5%
	Nil	14	30.4%
	Total	46	100.0%

Most common risk factor was previous medical abortion (19.5%) followed by IUCD (8.6%), D&C (6.5%), tubectomy (6.5%), OCP's (6.5%),recanalisation (4.3%), appendicectomy (2.2%), Diagnostic Hysterolaparoscopy (2.2%), infertility (2.2%), IUI conception (2.2%), laparoscopy (2.2%), and previous

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ectopic (2.2%).

Table 4: Distribution of patients based on the abdominal examination

		Frequency	Percent
Abdominal Examination	Tenderness	34	73.9%
	Distension	10	21.7%
	Guarding	11	23.9%
	Revealed no abnormality	3	6.5%

Abdominal Examination showed tenderness in 73.9% patients, distension in 21.7% patients and guarding in 23.9% patients.

Table 5: Distribution of patients based on the vaginal examination

			Frequency	Percent
Vaginal Examination	Uterine size	Increased	2	4.3%
		Normal	44	95.7%
	Cervix tenderness	Present	19	41.3%
		Absent	27	58.7%
	Fornices	Tenderness	2	4.3%
		Tenderness/ Mass	15	32.6%
		Nil	29	63.0%

Vaginal examination showed Increased Uterine size in 4.3% patients, Cervix tenderness in 41.3% patients and fornix tenderness & Tenderness/Mass in 36.9% patients.
Urine pregnancy test was positive in 97.8% patients.

Table 6: Distribution of patients based on the clinical manifestation and intra operative site

		Intra Operative Site					
		Ampullary	Cornual	Fimbrial	Isthmal	Tubo Ovarian mass	P value
Amenorrhoea	N	31	1	3	3	1	-
	%	100%	100%	100%	100%	100%	
Pain abdomen	N	29	1	3	3	1	0.96
	%	93.5%	100%	100%	100%	100%	
Bleeding P/V	N	4	0	1	0	1	0.20
	%	12.9%	0%	33.3%	0%	100%	
Others	N	9	1	1	0	0	0.20
	%	29%	100%	33.3%	0%	0%	

Amenorrhoea and Pain abdomen were the most common symptoms in patients who had ampullary pregnancy. Bleeding per vaginum was a complaint in12.9% of ampullary pregnancies.

Table 7: Distribution of patients based on the abdominal examination and intra operative tube status

Abdominal Examination		Intra Operative Tube Status			
		Ruptured	Tubal abortion	Unruptured	P value
Tenderness	n	21	2	11	0.68
	%	84.0%	66.7%	100.0%	
Mass	n	0	0	0	-
	%	0.0%	0.0%	0.0%	
Distension	n	10	0	0	0.09
	%	40.0%	0.0%	0.0%	
Guarding	n	11	0	0	0.06
	%	44.0%	0.0%	0.0%	

Abdominal Examination showed tenderness (84%) and distension (40%) in patients with ruptured tube on intra operative findings.

Discussion

Ectopic pregnancy is a life threatening emergency in obstetrics [14]. The increasing incidence of this condition is concerning because of an associated increase in pregnancy-related morbidity and mortality rates during the first trimester in women of childbearing age [15]. The incidence of EP is on the rise. It is thought to be related to increasing maternal age, tubal surgery, pelvic inflammatory disease (PID), practice of induced abortion, assisted reproductive techniques and perhaps more importantly increased

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ability to accurately ascertain the condition. [15] Studies have shown that EP leads to 3.5-7.1% of maternal mortality in India [16, 17].

In the present study, the incidence of ectopic pregnancy was 18.4 per 1000 deliveries. In a study conducted by Shraddha Shetty K *et al*. in Mangalore, the incidence was 5.6/1000 deliveries [18]. In a study conducted by Rashmi *et al*. the incidence was 1: 399 pregnancies [19]. In a study conducted by porwal sanjay *et al*., the incidence was found to be 2.46 per 1000 deliveries [20]. In Pranathi L *et al*., [15] incidence of EP was 1.08 or one in 92 pregnancies. In Tahmina S *et al*., [13] incidence of EP was 9.1/1000 pregnancies or one in 108 pregnancies. Ectopic pregnancies constituted 12.2% (113/926) of gynaecological admissions. An 11-year review of ectopic pregnancies in the health facility was conducted when it was run as a mission hospital reported a higher prevalence rate of 3.3% [21]. In comparison to these studies our study showed a higher incidence of 18.4 per 1000 pregnancies because 65.2% of patients belonged to the lower socio economic group, where the incidence and prevalence of chronic PID/STI are significant and do contribute to the problem.

In the present study, majority of the patients belonged to the age group of 26-30 years (52.2%) followed by 21-25 years (30.4%), 31-35 years (10.9%), 15-20 years (4.3%) and 36-40 years (2.2%). In Pranathi L *et al*., [15] Majority of the women were aged between 21 and 30 years. In Bansal N *et al*., [15] mean age was 27 ± 3 years. Majority of patients (90.09%) were with age group upto 30 years (182 of 202). In Tahmina S *et al*., [13] Majority of the women were aged 21-30 years (51.4%).

In the present study, clinical manifestations were amenorrhoea (100%), pain abdomen (95.7%) and bleeding P/V (15.2%). All patients presented with 5 to 8 weeks of amenorrhoea representing the time period required for the growing ectopic gestation to distend the tube andcause symptoms. These results are consistent with those from Tang BD *et al*. and Panti A *et al*. [22, 23]. In Bondada SC *et al*., [24] majority of cases presented with pain abdomen (93.3%) and amenorrhoea (84.4%). Other presenting symptoms included abnormal vaginal bleeding (38%), vomiting (31%), giddiness/syncopal attacks (17.7%) and burning micturition (13.3%). Uncommon symptoms were fever (2.2%), loose stools (6.6%) and constipation (4.4%). In Pranathi L *et al*., [15] classic triad of amenorrhea, vaginal bleeding, and lower abdominal pain was present in 17 (40.47%) cases. A history of preceding amenorrhea was present in 37 (88.09%) women. In Kharat D *et al*., [25] general presenting complaints wereabdominal pain (92.8%), amenorrhea (80.4%), abnormal vaginal bleeding (61.9%) and 27.8% of the cases had other symptoms. In Bansal N *et al*., [14] 62 of 202 presented with abdominal pain, 152 of 202 (75.24%) had amenorrhoea while 140 of 202 (69.30%) presented with vaginal bleeding. In Tahmina S *et al*., [13] classic triad of amenorrhoea, vaginal bleeding and lower abdominal pain was present in 29(40.3%) cases.

The analysis of the risk factors helps us to prevent the ectopic pregnancy with some strategic interventions. In the present study, most common risk factor was previous medical abortion (19.5%), followed by I U C D (8.6%), D&C (6.5%), tubectomy (6.5%), OCPs (6.5%), recanalisation (4.3%), appendicectomy (2.2%), Diagnostic Hystero Laparoscopy (2.2%), infertility (2.2%), IUI conception (2.2%), laparoscopy (2.2%), and previous ectopic (2.2%). In Kharat D *et al*., [25] There were no risk factors identified in 52.6% of the cases. Infertility of more than 4 years was seen in 15 cases. 8.8% of the patients had undergone procedures such as dilatation and curettage previously. 1.5% and 3.6% of the cases used contraceptives in the form of oralcontraceptive pills or IUCD respectively. Twenty-seven patients gave a history of pelvic inflammatory disease. Surgical procedures seen were appendicectomy in one patient and fivepatients had been operated previously for ectopic gestation. In Pranathi L *et al*., [15] most common risk factors were previous abortion (30.95%) and pelvic surgery (33.33%). In BansalN *et al*., [14] 120 of 202 (59.40%) had as past history of induced abortion while 87 of 202 (43.06%) had pelvic inflammatory disease, as risk factors for ectopic pregnancy. Other associated risk factors were previous history of abdominopelvic surgery (11.38%), previous spontaneous abortion (18.31%), intra uterine contraceptive device (10.39%) and previous ectopic pregnancy (5.44%). In Tahmina S *et al*., [13] most common risk factors were previous abortion (36.1%) and pelvic surgery (37.5%). In Odunvbun WO *et al*., [13] majorities (59.1%) of the participants with ectopic pregnancy had a history of induced abortion.

In the present study, abdominal Examination showed tenderness in 73.9% patients, distension in 21.7% patients and guarding in 23.9% patients. Vaginal examination showed Increased Uterine size in 4.3% patients, Cervix tenderness in 41.3% patients and fornix tenderness & Tenderness/Mass in 36.9% patients. In Bondada SC *et al*., [24] On examination, the most common sign was abdominal tenderness (77.7%) followed by adnexal tenderness and guarding. A properly done abdominal and bimanual examination is very useful in the diagnosis of ectopic gestation.

In the present study, intra Operative Site was ampullary in 79.4% patients, cornual in 2.6% patients, fimbrial in 7.7% patients, isthmal in 7.7% patients and tubo ovarian mass in 2.6% patients. In Tak PS *et al*., [26] commonest site for ectopic pregnancy was tubal (93.58%) followed by ovarian (3.84%) and cornual and C/S Scar both (1.28%). In Kharat D *et al*., [25] commonest site of location of the ectopic pregnancy was in the ampulla of the fallopian tube. Other sites were interstitial followed by isthmal pregnancy. In Bansal N *et al*., [14] commonest site of ectopic gestation was the ampullary region of fallopian tube (111 of 202, 54.95%), while lowest occurrence was at tubo-ovarian site (6 of 202, 2.97%). In Bondada SC *et al*., [24] ectopic pregnancies were found to be located in the ampullary segment (40%),

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followed by the isthmus (22.2%) and the isthmo-ampullary junction (20%). In Tahmina S *et al*., [13] site of ectopic was fallopian tubes in 68 cases (94.4%).

Conclusion

Timely diagnosis and management in early pregnancy units with point of care ultrasonography can reduce the morbidity and mortality due to ectopic pregnancy. In conclusion, identifying underlying risk factors, availability of point of care ultrasound and timely intervention will help reduce the morbidity and mortality due to ectopic pregnancy.

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