Original Article

Study of Risk factors and treatment modalities of ectopic pregnancy

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Abstract

Introduction: In the past two decades globally, the incidence of ectopic pregnancy has been increasing exponentially. One of the major triggering factors being the introduction of medical assisted procreation techniques. The present study emphasis more on clinical presentations, risk factors, associated maternal morbidity and mortality with respect to ectopic pregnancy. **Methodology:** Patients diagnosed with ectopic pregnancy in reproductive age group (15-44 years) after clinical examination and investigations during one year period were included in the study. It was a prospective study using contingency table analysis and Chi-square test. **Results:** A total of 42 patients were diagnosed and treated as ectopic pregnancy during the study period. Risk factors were found in 37 patients, of which most common were white discharge per vagina (WDPV) in 20 and tubectomy in 6 patients. PID was seen in 5 and no risk factors in 5 patients. Of the 42 patients, 37 underwent surgery as primary modality of treatment and 5 patients underwent medical management. Only 2 patients had complete resolution with medical management while 3 failed medical management. Post operative period was uneventful. **Conclusion:** As the incidence of ectopic pregnancy has been on the rise, screening of high risk cases, early diagnosis and early intervention are required to enhance maternal survival and conservation of reproductive capacity.

Keywords: Ectopic pregnancy, salpingectomy, tubal pregnancy

Introduction

Ectopic pregnancy (EP) is a life threatening emergency commonly being managed by primary care physicians where diagnosis is often be missed at the first contact. 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 can also present with hemodynamic shock. Since the maternal mortality is associated with higher number of risk factors and also with high risk pregnancies, ectopic pregnancy being one of them, this study becomes very useful to compile all the risk factors associated with ectopic pregnancy. For the practice of primary care physician patients with early pregnancy with risk factors should be referred to tertiary care centre to rule out ectopic pregnancy.[1]

It has always challenged ingenuity of the Obstetrician and Gynecologist by its bizarre clinical picture. A study done by Hoover *et al.* estimated that the EPs increased with age; it was 0.3% in girls and women aged 15 to 19 years and1% among women aged 35 to 44 years.[2]

An accurate history and physical examination and its correlation to the modern diagnostic technology are important in the diagnosis of ectopic pregnancy. To diagnose ectopic pregnancy, one has to be "ectopic minded". Despite a rising incidence, the

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related morbidity and mortality is declining in the developed countries due to well organized health - care delivery system, due to early recognition and treatment of ectopic pregnancies. The ectopic pregnancy mortality ratio declined by 56.6% from 1.15 to 0.50 deaths per 100,000 live births between 1980-1984 and 2003-2007 and is estimated to further decrease.[3] The most frequent causes of death for women with EP are hemorrhage, infection, and anesthetic complications.[4]

According to Mayo clinic 2020 guidelines suggested that some things which makes more likely to have an ectopic pregnancy which are: Previous ectopic pregnancy, Inflammation or infection, Fertility treatments (IVF), Tubal surgery, choice of birth control (IUD) and smoking.[5]

The present study was done to understand the clinical presentation, risk factors, associated maternal morbidity and mortality and various treatment modalities

Materials & Methods

A cross sectional study was conducted for a period of one year with clearance from the Institutional Ethical Committee. Ethical committee approval obtaine on Date:22/09/2012/ (Ref:SDMIEC:0384:2012). All patients who were diagnosed as ectopic pregnancy in the reproductive age group of 15-44 years were included with written informed consent. They were evaluated by complete history, clinical examination and relevant investigations and managed according to the condition of patient either medical, surgical or both.

Patients in shock were treated and then taken for surgery. Blood transfusion was given preoperative, intra-operative or postoperative as per the requirement of individual cases. Management plan was decided based on the individual case. Medical management was done for patients who fulfilled criteria for medical management and were treated with methotrexate (single/multidose regimen). Some, based on their general condition were posted for surgical management, either laparotomy or laparoscopic procedure. The site of ectopic gestation, status of the fallopian tube, contralateral tube, ovaries and uterus were noted. Depending on the condition of the tube, a decision for removal of the tube i.e., unilateral Salpingectomy/ salpingostomy/salpingotomy was made. Salpingectomy was combined with contra lateral tubectomy in patients who did not wish to conceive. In cases with obvious pathological findings on the opposite side, the diseased adnexa were removed. Specimen was sent for histopathology for confirmation.

Prophylactic antibiotics were given to all patients at the time of induction of anesthesia. Patients were observed in the postoperative period for the development of fever, abdominal pain, and distension of the abdomen and wound sepsis. Blood transfusion given if required. Patients were discharged with an advice to come for follow up after 2 weeks.

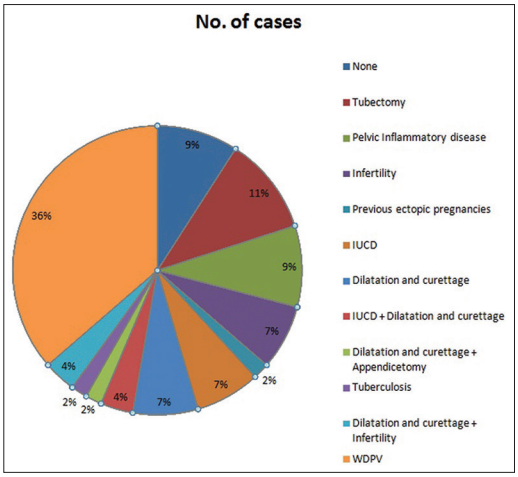
Results

In the present study, 42 cases of ectopic pregnancy were observed and treated. The maternal age ranged from 19 to 36 years. The maximum number of ectopic gestation in the present series occurred between the age group 26 to 30 years (38.10%). The youngest age was 19 years and oldest 36 years. The distribution of cases in relation to parity, maximum number of cases was nulliparous, 16 patients (38.10%). Majority of the cases i.e 19 (45.24%) belonged to socioeconomic class.[3]

Among the risk factors, white discharge per vagina was found to be most common (36.0%), followed by tubectomy (11.0%) [Graph 1]. The triad of symptoms i.e., amenorrhea, pain abdomen and per vaginal bleeding was seen in 40.47% of patients. Amenorrhea followed by pain abdomen was the most common symptoms. Other symptoms like nausea, vomiting and syncopal attacks were observed in 14 out of 42 patients i.e., 33.33%.

When site of presentation to mode of presentation was compared, amenorrhea and pain abdomen were still the most common symptoms seen in patients having ectopic pregnancy in ampullary region and bleeding per vagina was seen in 50% of cases [Table 1 and 2].

In ruptured ectopic pregnancy, amenorrhea (90%) and pain abdomen (86.3%) were the most common symptoms. In tubal abortion, pain abdomen (75.0%), the common symptom, andin unruptured ectopic pregnancies, amenorrhea was common (78.5%) [Table 3].



Graph 1: Risk Factors in Ectopic Pregnancy

Table 1: Mode of presentation

Symptoms	No of cases	Percentage
Amenorrhea	35	83.33
Pain abdomen	31	73.81
Bleeding	25	59.52
others	14	33.33

Table 2: Site distribution and mode of presentation

Mode of Presentation	Site of Presentation							
	Ampullary (26)	Isthmal (4)	Ovary (1)	Fimbrial (5)	Cervical (1)	Cornual (2)	Ampulla + Isthmal (3)	*P*
Amenorrhea	17 (65.3%)	4 (100%)	1 (100%)	4 (80%)	1 (100%)	2 (100%)	3 (100%)	*P*>0.05
Pain Abdomen	17 (65.3%)	3 (75%)	1 (100%)	4 (80%)	-	2 (100%)	2 (66.6%)	*P*>0.05
Bleeding	13 (50%)	2 (50%)	0	3 (60%)	1 (100%)	1 (50%)	3 (100%)	*P*>0.05
Others	12 (46.1%)	0	0	0	-	2 (100%)	0	*P*>0.05

Table 3: Mode of presentation and the conditionof the tube

Mode of presentation	Condition of the tube			
	Ruptured (22)	Tubal Abortion (4)	Unruptured (14)	*P*
Amenorrhea	20 (90%)	2 (50%)	11 (78.5%)	*P*>0.05
Pain Abdomen	19 (86.3%)	3 (75%)	8 (57%)	*P*<0.05
Bleeding	11 (50%)	2 (50%)	8 (57%)	*P*<0.001
Others	11 (50%)	2 (50%)	1 (7%)	*P*<0.001

Table 4: Abdominal examination and the condition ofthe tube

Abdominal examination	Condition of the ectopic pregnancy			
	Ruptured (22)	Tubal Abortion (4)	Unruptured (14)	*P*
Tenderness (25)	16 (64.0%)	2 (8.0%)	7 (28%)	*P*>0.05
Distension (8)	5 (62.5%)	2 (25.0%)	1 (12.5%)	*P*>0.05
Guarding (9)	6 (66.66%)	1 (11.0%)	2 (22.22%)	*P*>0.05

Table 5: Site of ectopic pregnancy on laparotomy/ laparoscopy

Site of ectopic pregnancy	No. of cases	Percentage
Ampullary	26	61.90
Isthmal	4	9.52
Cervical	1	2.38
Ovary	1	2.38
Fimbrial	5	11.90
Cornual	2	4.76
Ampullary + Isthmal	3	7.14
Total	42	100

Out of 42 patients only 7 patients presented with shock. Pallor was seen in 52.4%. Of the 7 patients who presented with shock, 3 patients had ampullary pregnancy, and one each had isthmal, fimbrial, corneal and ampullary-isthmal pregnancy. Only onein shock had tubal abortion .

Tenderness was a common feature seen in ruptured, unruptured and tubal abortion, but distension and guarding were seen more in ruptured than in unruptured and tubal abortion [Table 4].

Bleeding per vagina was seen only in 16.67% of the cases. Cervical motion tenderness was present in 54.7%. Urine pregnancy test was positive in 97.62% of cases which aided in diagnosis. All patients underwent ultrasonography and it was found to be unruptured in 54.76% cases.

Among 42 cases, ectopic pregnancy more commonly found on right side & the most common site was ampullary region of fallopian tube, followed by fimbrial and isthmal region and least common was in cervix and ovary i.e., one each [Table 5].

Surgery was the primary modality of treatment in 88.09% of patients and secondary modality had medical management in 7.1% of cases.

Most of the cases had laparoscopic unilateral salpingectomy (35.0%), and 15% had open unilateral salpingectomy, and 10% of patients had bilateral salpingectomy and 10% of the patients underwent tubal ligation on contralateral side and only one patient had undergone D&C for cervical pregnancy [Table 6]. Blood transfusion had to be done in 47.62% of the cases either preoperatively, intraoperatively or postoperatively [Figures 1 and 2].

Discussion

Although the incidence of ectopic pregnancy has remained static in recent years,[4] In this study the rate was found to be 10.7/1000 deliveries or 1 in 325 deliveries. In the present study 38.1% of patients are in age group of 26-35 years. In a study conducted by Panchal *et al.* 71.66% patients were in age group of 21-30 years of age, this may be because this is the period of maximum fertility and use of contraception is infrequent and occasional among these women.[7] Poonam *et al.* showed peak incidence in 26-30 years.[8] Biologic explanations for such variation in ectopic pregnancy incidence rates are anatomic and functional age-related changes of the fallopian tubes and also repeated pelvic inflammatory disease that may induce tubal damages and predispose women to ectopic pregnancy.[9]

In the present study, maximum cases occurred between parity 0 and 2, maximum patients were nulliparous (38.10%). In Panchal *et al.* study 80% of patients were of more than two parity.[6] In study of Rashmi A. Gaddagi & Chandrashekhar *et al.*, 27% were nulliparous, 10.8% were primiparous and the rest (62.2%) were multiparous[Table 7].[10]

In the present study, 11.9% of the patients had no risk factors, and the most common risk factor was history WDPV which was seen in 47.62% of patients.

History of PID was seen in 5 patients accounting for 11.9% of all risk factors. According to studies by Savitha Devi, Rose *et al.* and Rashmi AGaddagi & Chandrashekhar, the incidence of PID

Table 6: Surgical procedure

Procedure	No. of Cases	Percentage
Unilateral salpingectomy (open)	6	15.00
Bilateral salpingectomy (open)	3	7.50
Unilateral salpingo-oophorectomy (open)	1	2.50
Salpingectomy with contralateral tubal ligation (open)	2	5.00
Salpingo-oophorectomy. with contralateral tubectomy (open)	1	2.50
Open salpingostomy	2	5.00
Laparoscopic U/L salpingectomy	14	35.00
Laparoscopic salpingostomy	4	10.00
Laparoscopic bilateral salpingectomy	3	7.50
Laparoscopic right ovariotomy	1	2.50
Laparoscopic salpingectomy with contralateral tubal ligation	1	2.50
Dilatation and curettage	1	2.50
Segmental isthmic resection (open)	1	2.50
Total	40	100

Table 7: Etiology/Risk factors

Risk factors	Rose *et al.*[9] (2002)	Panchal *et al.*[5] (2011)	Rashmi A Gaddagi & Chandrashekhar[7] (2012)	Present study (%)
None	32.2	25	37.83	11.90
Tubectomy	5.4		16.21	14.29
PID	34.4	55	8.1	11.90
Infertility	-	11.6	16.21	9.52
Previous-ectopic pregnancies	3.2	-	2.7	2.38
IUCD	21.5	-	12.81	9.52
D&C	19.35	-	18.91	9.52
IUCD + D&C	-	-	18.91	4.76
D&C + Appendectomy	-	--	2.7	2.38
Tuberculosis	-	-	-	2.38
D&C + Infertility	-	-	-	4.76
WDPV	-	-	-	47.62

as a risk factor is 25%, 34.4% and 8.1% respectively.[10-12] PID following gonococcal, chlamydial and other bacterial infection causes a 3.3- 6fold increased risk of ectopic pregnancy.[13] Chlamydia trachomatis infection causes trachoma, an ocular infection that leads to blindness, and sexually transmitted diseases which includes pelvic inflammatory disease, chronic pelvic pain, ectopic pregnancy and epididymitis.[14]

According to Shah JP *et al.* ectopic pregnancy was more after postpartum tubal ligation because edematous congested friable tube increases the chance of incomplete occlusion of tubal lumen.[15] All these studies show that genital infections i.e., PID, particularly following chlamydial infections and recent change in sex life can cause pelvic inflammation and tubal damage in younger age groups causing more incidence of ectopic pregnancy in young, nulliparous or low parity woman.

In the present study, history of infertility was seen in 4 patients, contributing 9.52% of risk factors. The study conducted by Panchal *et al.* (2011), infertility was seen in 7 patients contributing to 11.66% of risk factors.[5] According to Rashmi A Gaddagi & Chadrashekhar, Savitha Devi and Rose *et al.*, a positive history of infertility was present in 16.21%, 48.07% and 15.1% patient's respectively.[10-12]

Although tubal pregnancy has been recognized for three and half centuries, the problem of accurate and early diagnosis has not been solved. The symptoms and signs of ectopic pregnancy often range from indefinite to bizarre clinical picture. In the present study classical triad of symptoms was seen in 40.47% of patients. Amenorrhea (83.33%) was the most common complaint followed by pain abdomen (73.81%). Bleeding per vagina was seen in 59.5% of patients. Other symptoms like nausea, vomiting, syncopal attacks were observed in 33.33% of patients. In the present study, 7 patients (16.66%) presented with shock as compared to 40.5% of patients in the study by Rashmi A Gaddagi & Chandrashekhar.[10]

Tenderness was the most common abdominal finding seen in 59.2% of patients and cervical motion tenderness was present in 54.76% of patients. These two findings were also significantly present in the study by Rashmi A Gaddagi &Chandrashekhar.[7] Also in their study 97.3% of patients had positive urine pregnancy test compared to this study where 41 patients out of 42 i.e., 97.62% of patients was positive. In only one patient, urine pregnancy test was negative. A small proportion of diagnosed ectopic pregnancies will resolve spontaneously without treatment, especially those with low and rapidly declining HCG levels.[16] Although other potential serum biomarkers have been

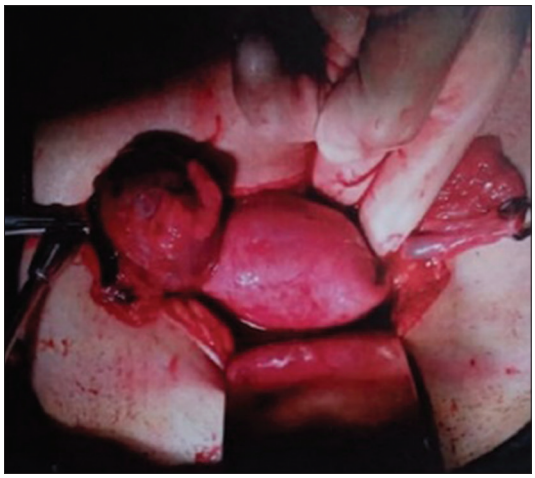


Figure 1: Right sided tubal ectopic pregnancy with ovariotomy

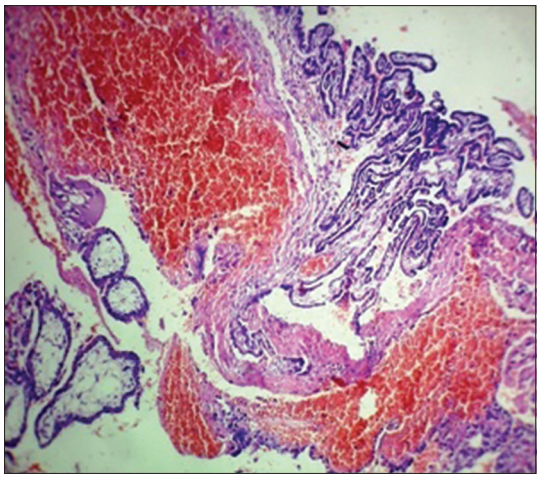


Figure 2: Fallopian tube showing chorionic villi anD trophoblastic epithelium amidst fresh hemorrhages . (H&E)

proposed,[17] none of these have been used in common clinical practice. New biomarkers with clinical utility would be helpful in improving the diagnosis of ectopic pregnancy, with the potential benefits of greater safety and reduced diagnostic costs.[18,19]

Widespread availability of ultrasound imaging in the past two decades has dramatically changed the practice of obstetrics and gynaecology.[20] Despite this, around half of the women with an eventual diagnosis of ectopic pregnancy are not diagnosed at their first presentation.[19,21] Early diagnosis reduces the risk of tubal rupture and allows more conservative medical treatments to be employed.[22]

Diagnosis can be straightforward when a transvaginal ultrasound scan (TVS) positively identifies an intra uterine pregnancy or ectopic pregnancy.[23] However, TVS lacks the ability to identify the location of a pregnancy in a significant number of women and such women are currently diagnosed as having a 'pregnancy of unknown location'.[24,25]

In this study ultrasonography was done in all patients. Ruptured ectopic pregnancy was seen in 45.24% of patients and unruptured in 54.76%. Ultrasound revealed ruptured ectopic pregnancy in 43.2% of the cases; an unruptured pregnancy in 8.1% of the cases and a terogenous mass in 40.5% of the cases.

Summary

The present study was done to understand the risk factors, maternal morbidity and mortality associated with ectopic pregnancy.

The incidence rate of ectopic pregnancy was found to be 10.7/1000 deliveries or 1 in 325 deliveries. The present study shows that 89.9% of the study subjects has risk factors associated with ectopic pregnancy and the most common risk factor was history WDPV which was seen in 47.62% of patients. Out of 42 patients 20 had WDPV, 6 patients underwent tubectomy, PID was seen in 5 patients.

Conclusion

In institutional settings, ectopic pregnancy accounted for 1% of total deliveries. More than half of all women with ectopic pregnancies presented with acute abdomen and required emergency laparotomy/laparoscopy. All the cases were diagnosed with a high index of clinical suspicion and the USG findings added to the diagnosis. It is therefore important that all the clinicians should be sensitive to the fact that in the reproductive age group, any women presenting with pain in the lower abdomen, diagnosis of ectopic pregnancy should be entertained irrespective of the presence or absence of amenorrhea, whether or not she has undergone sterilization. Though the recent trend in the management of ectopic pregnancy is the use of a conservative surgical or medical line of management, radical surgery or salpingectomy was the treatment modality which was used in the present study. This was mainly because majority (80%) of the cases was referred or they came late to the hospital after the ectopic pregnancy had ruptured.

Importance of TVS for unruptured ectopic pregnancy at early stage, further complications can be avoided. Due to advanced diagnostic techniques, conservative treatment is also possible and with recent surgical technique, the morbidity and mortality has drastically reduced. Because the vast majority of women with EP are now hemodynamically stable, medical management with MTX has become a first-line therapy. As EPs are directly related to pelvic infections, especially sexually associated ones, prevention should be the watchword.

It is important to know when the patient should be referred to tertiary care centre.

Declaration of patient

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other

clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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