International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2020; 4(3): 219-226
Received: 20-01-2020
Accepted: 22-02-2020

Preeti Attri
Resident
Dr. Rajendra Prasad Government Medical College, Kangra, Himachal Pradesh, India

Dr. Amit Gupta
Associate Professor (ObG)
Dr. Rajendra Prasad Government Medical College, Kangra, Himachal Pradesh, India

Dr. Anju Vij
Associate Professor (ObG)
Dr. Rajendra Prasad Government Medical College, Kangra, Himachal Pradesh, India

Dr. Bharti Gupta
Associate professor (Anesthesia)
Dr. Rajendra Prasad Government Medical College, Kangra, Himachal Pradesh, India

Corresponding Author:
Dr. Amit Gupta
Associate Professor (ObG)
Dr. Rajendra Prasad Government Medical College, Kangra, Himachal Pradesh, India

A clinical study of the incidence, management and outcome of ectopic pregnancy

Preeti Attri, Dr. Amit Gupta, Dr. Anju Vij and Dr. Bharti Gupta

DOI: https://doi.org/10.33545/gynae.2020.v4.i3d.607

Abstract
Background: Ectopic pregnancy is one of the most dreaded complications of early pregnancy which risks the life of young women. However, in the present scenario, with better health care facilities, maternal mortality has been reduced drastically; it still remains a matter of concern in third world countries.
Methods: This prospective study was conducted in the department of Obstetrics and Gynecology, Dr. Rajendra Prasad Government Medical College Kangra at Tanda, Himachal Pradesh after all ethical permissions, to study the incidence, management and outcome of ectopic pregnancy. 98 women, who were diagnosed as having ectopic gestation, were enrolled for the study after their informed consent.
Results: In the present study, the incidence of ectopic pregnancy was 9.1 per thousand deliveries. 58.16% of the patients presented at the gestational age of 6-8 weeks. History of abdominal and pelvic surgery (30.61%) and infertility (22.45%) were the most common associated risk factors. The typical triad of amenorrhea, pain abdomen and bleeding was observed in 40% of cases. 7.95% of the patients were severely anemic and 5 patients presented with shock. Adnexal tenderness was the most common sign elicited clinically (84.69%), whereas, complex adnexal mass was confirmed in 96.93% of the patients on sonography. 84.69%, 16.32% and 1.02% of the total patients were managed with surgical, medical and expectant treatment respectively. The most common procedure performed was unilateral salpingectomy in 75.56% of the patients. 76.53% of the cases required blood transfusion for resuscitation in their operative and postoperative period and 8 patients needed ICU admission. There was no maternal mortality in the current study.
Conclusion: Rising incidence rates of ectopic pregnancy should alert gynecologist in general, efforts should be made for early diagnosis of ectopic pregnancy and timely referral to reduce maternal morbidity and mortality.

Keywords: ectopic pregnancy, hemoperitoneum, morbidity

Introduction
Motherhood is a dream of every woman but this dream is not always pleasant and one may have some nightmares through this journey. Ectopic pregnancy is one such nightmare and life threatening condition that every practicing obstetrician and gynecologist encounters in his or her practice. Ectopic pregnancy (EP) is an acute emergency and may be an important cause of maternal mortality and morbidity in the first trimester if not diagnosed and treated timely [1].
Ectopic pregnancy results following implantation anywhere other than the endometrial cavity of uterus, fallopian tube being the most frequent site [2, 3]. Most common tubal site is ampulla (55%), isthmic (25%), fimbrial (17%) and interstitial (2%). Extra tubal sites can be the uterus itself (cornual, cervical or in a rudimentary horn of uterus), ovary, broad ligament and abdominal cavity. Most of the abdominal pregnancies are secondary to tubal abortion or rupture and subsequent implantation on the bowel, omentum or mesentery [4]. Rarely, ectopic pregnancy may be bilateral or may be concurrent with an intrauterine pregnancy (heterotrophic) [5]. This catastrophic life threatening condition is one of the commonest acute abdominal emergencies and accounts for approximately 2% of all pregnancies [6].
Etiology of ectopic pregnancy includes anatomic alteration, disruption or damage to the mucosal portion of the fimbria or fallopian tube preventing normal embryo transport. Other possible causes consist of, inherent defect in fertilized egg, delayed-ovulation, post-mature eggs with tendency to implant before arrival in the uterus. Increased smooth muscle activity, muscular tone in the isthmus of the fallopian tube, due to high estrogen, may facilitate the retention of a fertilized ovum in the ampullary portion of the tube for a few days. High levels of progesterone too reduce smooth muscle activity, decreasing tubal peristalsis and thus favoring ectopic

pregnancy. Therefore, the transport of the fertilized ovum through the fallopian tube and implantation within the endometrial cavity may require an optimum ratio of estrogen and progesterone.

The increase in the incidence of ectopic pregnancy is considered to be the aftermath of rising incidence of pelvic inflammatory diseases, venereal diseases, use of contraceptive measures and assisted reproductive techniques. The factors leading to tubal damage include pelvic inflammatory disease (PID), chlamydia trachomatis infection being linked to 30-50% of all pregnancies [7]. Chances of ectopic after one episode of salpingitis is 12.8%, 30% after two episodes and nearly 75% after three episodes of salpingitis [8]. The risk of tubal pregnancy after any sterilization procedure is 5% to 16% [9]. Levonorgestrel device have got the lowest rate of ectopic pregnancy and progestasert has got the highest rate [10]. Advancing maternal age, smoking, diethylstilbestrol (DES) exposure in utero are other causes that favors ectopic implantation. However, half of all women with diagnoses of ectopic pregnancy may not have any known risk factors [11].

Serial β-hCG measurement is widely used in the diagnosis of early pregnancy complications. Trans-vaginal ultrasound (TVS) is the investigation of choice in symptomatic patients. It carries sensitivity of 90.9% and of specificity 99.9%. Absence of intrauterine gestational sac on TVS when the β-hCG are >1500 IU is diagnostic of ectopic pregnancy. Using trans abdominal ultrasound, absence of intrauterine gestational sac at β-hCG concentration > 6500 IU has a sensitivity of 100%, specificity of 96%, positive predictive value of 87% and negative predictive value of 100% for prediction of ectopic pregnancy [12]. High definition ultrasonography, particularly using trans vaginal route has revolutionized the assessment of patients with early pregnancy problems, allowing for clearer visualization of both normal and abnormal gestations [13]. Suspicion of an ectopic pregnancy increases if free fluid is visualized, either surrounding the uterus or in pouch of douglas [14].

Diagnostic Laparoscopy is gold standard investigation if ultrasound is inconclusive. In selected cases of pregnancy of unknown location (PUL), a dilatation and curettage may be useful when performed in association with a negative diagnostic laparoscopy for suspected ectopic pregnancy. The absence of chorionic villi, in presence of raised β-hCG level is suggestive of ectopic pregnancy. When the diagnosis is made, there are different therapeutic options that depend on hemodynamic stability of patients, β-hCG level, the dimension of adnexal mass, site of ectopic pregnancy, cardiac activity of the fetus and compliance of the patient.

Ectopic pregnancy can be effectively managed surgically, medically and expectantly

Surgical management includes salpingectomy, salpingotomy and tubal re-anastomosis. Laparoscopic approach is preferable to an open approach in patient who is hemodynamically stable. Laparoscopic approach is associated with shorter operative time, less intraoperative blood loss and shorter hospital stay [15]. Laparotomy should be reserved for patients presenting with hemoperitoneum and hypovolemic shock. If contralateral tube is healthy, the preferred option is salpingectomy, where the entire fallopian tube or affected segment containing the ectopic gestation is removed. Salpingotomy is removal of ectopic pregnancy, by dissecting it out of the tube, leaving fallopian tube in situ in attempt to preserve fertility.

On the other hand the patients who are hemodynamically stable with no intra-abdominal hemorrhage, having serum β-hCG < 3000 IU/L and gestational sac less than 4 cm without any fetal cardiac activity are ideal candidates for medical treatment. Drugs commonly used for are: Methotrexate (MTX), Potassium chloride (KCL), Prostaglandin (PGF2α), hyperosmolar glucose or Actinomycin. Methotrexate is used as a single dose regimen intramuscularly (50mg/m2) or the multi-dose regimen. Multi-dose regimen consist of methotrexate 1 mg/kg I/M on day 1, 3, 5 and 7 to a maximum of four doses and Leucovorin rescue therapy at dose of 0.1 mg/kg on alternate days 2, 4, 6 and 8. This treatment may be appropriate for patients who present with larger adnexal mass and greater initial levels > 5000 IU/L.

Expectant management is a conservative strategy consisting of observation and assessment of whether the ectopic pregnancy is continuing to resolve spontaneously and successfully without intervention [16]. A suitable candidate for expectant management must have an ectopic pregnancy with no evidence of rupture, be clinically stable and asymptomatic, and have consistently declining β-hCG concentrations. Follow-up should be 1-3 times weekly along with with β-hCG measurement and ultrasonography preferably TVS. Indications for expectant management are: Initial serum β- hCG level < 1000 IU/L, the subsequent levels are falling, gestation sac size < 4 cm with nil cardiac activity on TVS, without any evidence of hemoperitoneum and patient with good compliance.

Other sites for ectopic pregnancy are

Ovarian pregnancy accounts for up to 3% of all the ectopic pregnancies and is the most common type of non-tubal pregnancy [18, 19]. The only risk factor associated with the development for ovarian pregnancy is the current use of an intrauterine device. Diagnostic criteria described by Spiegel berg for ovarian pregnancy are [20]:

1. The fallopian tube on the affected site must be intact.
2. The gestational sac must occupy the position of the ovary.
3. Ovary must be connected to the uterus by the ovarian ligament.
4. Definite ovarian tissue must be present, histologically, in the wall of the gestational sac.

Patients have symptoms similar to ectopic pregnancy. Ovarian cystectomy is the most preferred surgery performed. Methotrexate treatment is appropriate for persistent trophoblast and has also been used for as primary treatment. Follow-up with β-hCG monitoring is essential.

Cervical pregnancy: Implantation is within the cervical canal. Common predisposing factors are curettage, caesarean section or other cervical surgical procedures. Usually the first complaint is of painless vaginal bleeding.

Clinical criteria for diagnosis of the cervical pregnancy are [21]

1. The uterus is smaller than the surrounding distended cervix.
2. The external os may be open.
3. Cervix is often blue or purple in color.
4. Profuse bleeding on manipulation of cervix.

Infiltration of the cervix with a hemostatic vasoconstricting agent, followed by the placement of cervical sutures to temporarily occlude the descending branches of the uterine arteries followed by suction curettage (without dilatation) and post-curettage cervical canal balloon tamponade has proven successful in treating first trimester cervical pregnancies. Another treatment option is uterine artery embolization which

has been used in combination with MTX. If laparotomy is required, an attempt can be made to ligate the uterine or internal iliac arteries [22]. Hysterectomy may be required in patients not responding to conservative procedures.

Abdominal Pregnancy: It is one of the rarest and most serious types of extra-uterine pregnancy. Abdominal pregnancy is associated with high morbidity and mortality, with risk for death 7 to 8 times greater than tubal pregnancy and 50 times greater than intra-uterine pregnancy [23]. The abdominal pregnancy can be classified as primary and secondary abdominal pregnancy. A primary abdominal pregnancy, the one in which a fertilized ovum implants itself initially on some abdominal organs. A primary abdominal pregnancy is considered provided it fulfills the following Studdiford's criteria.

1. Normal bilateral fallopian tubes and ovaries.
2. The absence of utero-peritoneal fistula.
3. The presence of pregnancy related exclusively to the peritoneal surface, early enough to eliminate the possibility of secondary implantation after primary tubal nidation.

Secondary abdominal pregnancies refer to pregnancies that originated in the tubes or, less commonly, the ovaries and re-implant in the peritoneum where the embryo or fetus continues to grow. Implantation in the pouch of douglas is the most common site for abdominal pregnancy.

The presentation of patients varies and depends upon gestational age. In the first trimester and second trimester, the symptoms are same as tubal pregnancy. In advanced abdominal pregnancy the clinical presentation is more variable. Secondary abdominal pregnancies following tubal abortion or tubal rupture are usually advanced at presentation and require an open procedure. If the placenta is firmly attached with no significant bleeding it can be left in situ after trimming the cord and membranes. Postoperative methotrexate has been used to assist involution.

Interstitial Pregnancy: Interstitial pregnancies represent about 2.4% of all the ectopic pregnancies [28]. The pregnancy is implanted in the tubal segment which is within the muscular wall of the uterus. Pain is more common than bleeding at clinical presentation. A significant number of women have a history of damaged tubes and surgery including salpingectomy. Many are diagnosed at first trimester scanning by the presence of an eccentric gestational sac. Treatment is cornual resection by laparotomy.

Caesarean Scar Pregnancy: Cesarean scar pregnancy is defined as the implantation of a gestational sac within the scar of a previous cesarean surgery. It is potentially dangerous condition with higher risks of uterine rupture, devastating hemorrhage, loss of subsequent fertility and even maternal mortality. Medical treatment using methotrexate is an appropriate first line measure. Blind uterine curettage, which may not reach the gestation sac, may result in heavy bleeding and should be discouraged. Surgical removal can be carried out by operative hysteroscopy or laparoscopy, with the choice depending on the location of the pregnancy sac. Open surgical treatment by wedge resection should be considered in women who do not respond to these methods and for women who present after rupture or if facilities and expertise for operative endoscopy are not available.

Heterotopic pregnancy: It occurs when intrauterine and ectopic pregnancy, co-exist. Heterotopic pregnancy is more likely after ART. Persistent or rising chorionic gonadotropin levels after dilatation and curettage for an induced or spontaneous abortion, with more than one corpus luteum on sonography, should make the treating physician suspicious of this possibility. The ectopic pregnancy is treated surgically if intrauterine pregnancy is desired [24].

Multiple ectopic pregnancies: Twin or multiple ectopic gestations occurs less frequently than heterotrophic gestations and may appear in a variety of locations and combinations. Multiple ectopic pregnancies are rare, but incidence is rising due to advent of assisted reproductive techniques.

Pregnancy after hysterectomy: The most unusual form of ectopic pregnancy is one that occurs after vaginal hysterectomy or abdominal hysterectomy [25]. Most of pregnancy occurs after supra cervical hysterectomy because patient has cervical canal that provide intra peritoneal access. Pregnancy after total hysterectomy occur secondary to vaginal mucosal defects that allows sperms to enter abdominal cavity.

Aims and Objectives

1. To study the incidence of ectopic pregnancy.
2. To study the management of ectopic pregnancy.
3. To study the outcome of all cases of ectopic pregnancy.

Material and Methods

This study was carried out in department of Obstetrics and Gynecology at Dr. Rajendra Prasad Government Medical College, Tanda. (Kangra) H.P. after the approvals from protocol review committee and institutional ethics committee. All pregnant women attending antenatal clinic and emergency of department of Obstetrics and Gynecology with features and diagnosis of ectopic pregnancy, who were willing to participate, were enrolled for study after obtaining informed consent. All the patients who did not give consent to participate were excluded from the study.

A detailed history and examination of enrolled patients was recorded on the printed proforma**.** The data included clinical details regarding demographic profile of patients, presenting complaints, obstetric, menstrual history, past history details regarding previous ectopic pregnancy, pelvic inflammatory disease, dilatation and curettage, previous tubal surgeries-tuboplasty, appendectomy or any other abdominal surgery, history of infertility, contraceptive history were enquired and recorded.

General examination included

1. Pulse, respiratory rate, blood pressure and temperature.
2. Condition of patient-Pallor, restlessness, cold clammy extremities and evidence of presence of shock.

Cardiovascular and respiratory systems were also examined

Per-abdomen and per-vaginal examination included following

1. Abdominal tenderness, guarding and rigidity.
2. Presence of mass, signs of free fluid in peritoneal cavity.
3. Presence of rare signs like Cullen's sign.
4. Bleeding PV-nature and color of blood
5. Color of the cervix
6. Tenderness on movement of the cervix.
7. Position of the cervix whether pulled or not.
8. Size of the uterus, mobility and consistency
9. Presence of mass in any of the fornices.

Per-rectal examination was done wherever required.

The investigations carried out were: Urine pregnancy test, HB%, blood grouping, Rh typing and ultrasonography TAS/TVS, serial β-hCG where ever required.

Management was individualized; hemodynamically unstable patients, after confirmation of diagnosis were immediately taken for exploratory laparotomy and were simultaneously resuscitated with fluids and blood transfusions. Hemodynamically stable patients were managed medically or expectantly or by exploratory laparotomy with salpingectomy as per institutional protocol. Patients who fulfilled criteria for medical management were given single dose of methotrexate by measuring body surface area. They were further followed up with serial β-hCG and ultrasonography.

Surgical Procedure

All the surgical procedures were performed under general anesthesia. Abdomen was opened with suitable incision. The site of ectopic gestation, status of the fallopian tube, contralateral tube, ovaries and uterus was noted. As majority of the patients had ruptured tubal gestation, a decision for removal of the tube i.e., unilateral salpingectomy was made. Salpingectomy was combined with contralateral tubectomy in patients who did not wish to conceive. In cases with obvious pathological findings on the opposite side, the diseased adnexa was removed and specimen sent for histopathological examination. Peritoneal toileting was done wherever required. After surgery patients were monitored as per standard post-operative institutional protocol. Patients were discharged with an advice to come for follow up after a week, and 6 weeks or as when required.

Statistical analysis

Results obtained have been analyzed statistically using appropriate software.

Observations

This study was conducted in the department of Obstetrics and Gynecology, at Dr. RPGMC, Kangra, at Tanda, Himachal Pradesh from May, 2017-April, 2018 to study incidence, management and outcome of the ectopic pregnancy.

Table 1: Incidence in the present study

Cases	No. of cases	Percentage (%)
Total number of deliveries	10588	99.082%
Number of ectopic pregnancies	98	0.9170%
Grand Total	10686	

During this study period, 98 patients presented as ectopic pregnancy in addition to 10588 total deliveries. So the total number of the total patients studied was 10686 and the incidence of ectopic pregnancy was noticed to be 0.9170% (Table 1).

Demographic characteristics of the patients were as depicted in tables 2-5.

Table 2: Booking status

Booking status	No. of cases	Percentage (%)
Unregistered	74	75.51%
Registered	24	24.49

Table 3: Marital status

Marital status	No. of cases	Percentage (%)
Married	96	97.95%
Unmarried	2	2.04

Table 4: Age Distribution

Age in years	No. of cases	Percentage (%)
<20 Years	4	4%
21-25 Years	14	14.28%
26-30 Years	47	47.95%
31-35 Years	19	19.38%

Table 5: Socio-Economic status

Socio-economic status	No. of cases	Percentage (%)
Upper class	08	8.16%
Upper middle class	13	13.27%
Lower middle class	52	53.06%
Upper lower class	15	15.31%
Lower class	10	10.20%

In our study, majority of patients (43.87%) were primigravida, 30.61%, 17.34% and 8% of the patients presented as second, third and fourth gravida respectively. Out of which 29.59% patients presented at <6 weeks, 58.16% patients at 6-8 weeks and 2.04% patients at >8 weeks of period of gestation, whereas in 10.20% of the patients the period of amenorrhea was not exactly known (Table 6 -7).

Table 6: Gravidity and Parity

Gravidity	No. of cases	Percentage (%)
Primi	43	43.87%
Second	30	30.61%
Third	17	17.34%
Fourth	8	8%

Table 7: Period of amenorrhea at time of admission

Period of amenorrhea	No. of cases	Percentage (%)
<6 weeks	29	29.59%
6-8 weeks	57	58.16%
>8 weeks	2	2.04%
Not known	10	10.20%

The leading risk factors were previous abdominal/pelvic surgery, H/O Infertility, H/O PID, H/O suction evacuation, MTP Pill intake. In some patients multiple risk factors were associated, whereas, in some others (45.91%) no such risk factor could be noticed (Table 8).

Table 8: Risks factors

Risk factors	No. of cases	Percentage (%)
Previous abdominal./pelvic surgery	30	30.61%
H/O Infertility	22	22.45%
H/O PID	19	19.39%
H/O S/E	19	19.39%
H/O MTP pill intake	14	14.29%
H/O Contraception	10	10.2%
H/O Previous Ectopic	7	7.14%
H/O Previous Sterilization	6	6.12%
H/O D&C	5	5.12%
H/O Genital TB	2	2.04%

Majority of the patients (40%) presented with classical triad of symptoms of ectopic pregnancy *i.e.* amenorrhea, pain abdomen and bleeding per vaginum. However other were having either one or two of the three, of these symptoms (Table 9).

Table 9: Symptomatology at presentation

Symptoms	No. of cases	Percentage (%)
Amenorrhea	88	89.79%
Bleeding per vaginum	51	52.04%
Pain abdomen	46	46.93%

Pallor, abdominal tenderness, abdominal rigidity, bleeding per vaginum, cervical motion tenderness/adnexal tenderness were the dominant signs during general physical, abdominal and vaginal examination, at the time of admission. Bleeding per vaginum and cervical motion tenderness was noticed in 59.18% and 69.39 % of the patients respectively. Urine pregnancy test (UPT) was positive in 97.95% of the cases. The patient, who had negative UPT, had chronic ectopic pregnancy. Ultrasound findings of empty uterus with elevated β-hCG/positive pregnancy test, with adnexal mass/sac with or without cardiac activity and fluid in peritoneal cavity/POD were helpful in clinching the diagnosis (Table 10-11).

Table 10: Signs in patients at time of admission

Examination	Signs	No. of cases	Percentage (%)
General Physical Examination	Pallor	96	97.95%
	Shock	5	5%
Abdominal Examination	Abdominal tenderness	72	73.46%
	Abdominal rigidity	32	32.65%
	Abdominal mass	9	9.1%
Speculum Examination	Bleeding present	58	59.18%
	Bleeding absent	40	40.82%
Vaginal Examination	Adnexal tenderness	83	84.69%
	Adnexal mass	72	73.46%
	Cx motion tenderness	68	69.38%

Table 11: Investigations

Investigations	Findings	No. of cases	Percentage (%)
Urine pregnancy test	Positive	96	97.95%
	Negative	2	2.04 %
Hemoglobin	< 5gm/dl	8	8.16%
	5.1-6gm/dl	18	18.37%
	6.1-7gm/dl	26	26.53%
	7.1- 8gm/dl	21	21.43%
	8.1-9gm/dl	21	21.43%
	9.1-10gm/dl	4	4.08%
	>10gm/dl	0	0
Ultrasound Findings	Empty uterus	98	100%
	Adnexal mass	95	96.93%
	Presence of fluid in POD	74	75.51%
	Presence of fetal cardiac activity	40	40.81%

Most of the patients required surgery (82.65% + 2.04% = 84.69%) and underwent exploratory laparotomy followed by salpingectomy with peritoneal toileting while 16.32% and 1.02% were managed medically and expectantly respectively (Table 12).

Table 12: Type of management

Type of management	No. of cases	Percentage (%)
Surgery alone	81	82.65%
Medical alone	16	16.32%
Failed medical management followed by surgery	2	2.04%
Expectant	1	1.02%

Those who underwent exploratory laparotomy were observed for site of ectopic pregnancy, condition of tube, other associated intra-peritoneal findings and the type of surgery performed. In majority of the patients, fallopian tube was found to be ruptured (86.74%), the site of ectopic gestation was ampulla of the tube (43.37%) and the surgery performed was unilateral salpingectomy (75.90%) (Table 13).

Table 13: Operative findings

Operative findings		No. of cases	Percentage (%)
Site of ectopic pregnancy	Ampulla	36	43.37%
	Isthmic	32	38.55%
	Cornual	6	7.228%
	Fimbrial	6	7.228%
	Ovary	2	2.409%
	CS Scar	1	1.204%
Condition of tube	Ruptured	72	86.74%
	Unruptured	11	13.25%
Type of surgery	Unilateral Salpingectomy	63	75.90%
	Unilateral Salpingo-oophorectomy	6	7.22%
	Unilateral salpingectomy with contralateral tubal ligation	6	7.22%
	Unilateral salpingectomy with cystectomy	3	3.614%
	B/L salpingectomy	2	2.409%
	Laparoscopic salpingectomy	2	2.409%
	Excision of mass and repair of defect	1	1.83%
Other Findings	Pelvic adhesions	12	14.4%
	Fibroids	4	4.8%
	Uterine anomalies	4	4.8%
	Ovarian cyst	3	3.6%
	Absent tube	3	3.6%
	Endometriosis	2	2.4%
	Hydrosalpinx	1	1.2%
	Absent ovary	1	1.2%
	Beaded appearance of tube	1	1.2%

76.53% of the patients required blood transfusion but only 12.24% and 1.02% needed > three and five units of blood respectively, for resuscitation. Only 9.63% of the patients were critical and admitted to ICU postoperatively and there was no maternal mortality (Table 14-15).

Table 14: Distribution on basis of blood transfusion

Degree	Quantity	No. of cases	Percentage (%)
Minor	1-2 Units	62	63.2%
Moderate	3-4 Units	13	12.24%
Major	>5 Units	1	1.02%
Total		75	76.53%

Table 15: Post-operative complications in the present study

Post-operative complications	No. of cases	Percentage (%)
I.C.U Admissions	8	9.63%
Wound infections	4	4.08%
Re-laparotomy	1	1.20%
Maternal death	0	0

Discussion

Ectopic pregnancy is a common obstetrical emergency in early pregnancy all over the world. Even today, it remains the important cause of maternal mortality and morbidity. The present prospective study was carried from May, 2017 to April, 2018 in the department of Obstetrics and Gynecology, at Dr. Rajendra Prasad Medical College and Hospital, Kangra, at Tanda, a tertiary care hospital.

Table 16: Comparison of incidence

Study	Incidence (per 1000 deliveries)	p value
Present study	**9.1**	
Shetty *et al.* [26]	5.6	0.0885
Muftii *et al.* [27]	3.99	0.1615
Gupta R *et al.* [28]	2.46	0.0420

Ectopic pregnancy accounts for 3.5-7.1% of maternal mortality in India. The incidence reported by Indian Council of Medical Research (ICMR 1990) task force in their multi centric case control study was 3.86 per 1000 live births in the hospital reported pregnancies. In our study, the incidence of ectopic pregnancy was 9.1 per thousand deliveries as there were 10855 deliveries and 98 patients were diagnosed as ectopic pregnancy. Shetty *et al*. Muftii *et al*. and Gupta R. *et al*. reported lower incidence of 5.6%, 3.99% and 2.46% respectively in their studies. High incidence, in our study, could be due to the fact that our hospital is a tertiary institution with high rate of referrals from peripheral hospitals (Table 16).

Majority of our patients belonged to low socioeconomic status (63.26%), which is comparable to studies conducted by Prasanna B *et al*. (74%) and Shivakumar *et al*. (75%) [29, 30]. Women belonging to low socioeconomic status have poor personal hygiene, predisposing them to pelvic inflammatory diseases.

In present study, the mean age of presentation was 28 years. 47.95% women were in the age group of 26-30 years which is in agreement to a study conducted by Muftii *et al*. (52.5%). In studies done by Wakankar *et al*. and Chate *et al*. the percentage of patients, in this age group, was 28.8% and 34.4% respectively [31, 32]. This may be related to rise in the age at first conception.

In our study, 43.8% of total patients were primigravida which is comparable to the study of Tahmina *et al*. (34.7%) [33]. Only 16% of the patients were primigravida in a study by Prasanna. B *et al*. Contrary to all this, ectopic pregnancy was more noticed in higher order of pregnancy by Mehta *et al*. [34] (41.25%) and Wakankar *et al*. (28%) whereas, only 8% of patients in current study were having higher gravidity (Table17).

Table 17: Ectopic pregnancy in multigravida

Study	Parity	Percentage (%)	p value
Present study	**>G4**	**8%**	
Wakankar *et al.*[31]	>G4	28%	0.0008
Mehta *et al.*[34]	>G4	41.25%	0.047

In our study, it was observed that 58.16% of the patients presented at the gestation of 6-8 weeks whereas, 72.75% and 40.3% of the total patients reported at this gestation in the studies conducted by Mehta *et al*. (p value= 0.073) and Ranji *et al*. ((p value=0.0392), respectively [35]. This may be due to the early diagnosis of ectopic pregnancy these days owing to various current diagnostic modalities.

There have been multiple risk factors associated with ectopic pregnancy. In the current study too, 54.08% of patients presenting as ectopic pregnancy were associated with one or more such risk factors. Similar results were observed by Muftii *et al*. (53.23%) in their study. However, Chate *et al*. and Mehta *et al*. noticed 61% and 66.25% association of these risk factors respectively. The association of ectopic pregnancy with previous history of various risk factors was studied and compared with different studies. Chate *et al*. observed that 20.43% patients were having previous history of infertility which was at par with study inherent to us. In the present study, history of abortions was observed in 33.6% of patients whereas it was noticed in 26.1% of cases in study done by Majhi *et al*. [36] (Table 18). On the other hand, many of our patients with ectopic pregnancy were not having any association with any such risk factor (45.91%). This was found to be comparable to the study done by Mufti *et al*. (44.7%). Mehta *et al*. and Shivakumar *et al*. also reported that 33.75% and 35% of the patients respectively presented without any risk factor (Table 18).

Table 18: Comparison of risk factors

Study	Abortion	MTP Pill	Tubal Surgery	Previous Ectopic pregnancy	infertility	PID
Present study	**33.6%**	**14.28%**	**8.1%**	**7.14%**	**22.24%**	**19.39%**
Muftii *et al.* [27]	21%	-	10%	5.2%	8.7%	10.01%
Chate *et al.* [32]	-	-	23.65%	-	20.43%	10.78%
Mehta *et al.* [34]	-	13.75%	12.5%	3.75%	6.25%	-
Ranji *et al.* [35]	-	-	-	-	31.5%	-
Majhi *et al.* [36]	26.1%	-	11%	-	12.2%	12.8%

Majority of the patients with ectopic pregnancy generally present with classical triad of signs and symptoms. This triad includes amenorrhea, pain abdomen and bleeding per vaginum. Some patients on the other hand present with bizarre signs and symptoms. We found that 40% of our patients presented with classical presentations of amenorrhea, pain abdomen and bleeding per vaginum. Wakankar *et al*. observed that 53.84% patients reported with classical signs and symptoms of ectopic pregnancy. The percentage of such patients was 27.7% in the research done by Ranji *et al*. Statistical analysis of classical triad on comparison with other similar studies showed insignificant p values (Table 19).

Table 19: Comparison of Classical triad of symptoms (Amenorrhea, Pain, and Bleeding)

Study	Percentage (%)	p value
Present study	**40%**	
Wakankar *et al.* [31]	53.84%	0.1217
Mehta *et al.* [34]	71.25%	0.1381
Ranji *et al.* [35]	27.7%	0.1101

Cervical motion tenderness, a sign of ectopic pregnancy, was noticed in 82.2% of cases by Majhi *et al*. in their study. Our study also showed that 69.39 % of the patients were having cervical motion tenderness.

In our study, the right fallopian tube was more frequently affected than left one which correlated with study by Ranji *et al*. However, there was no significant difference between the sides of the tube involved in other studies in literature. The

commonest site of ectopic pregnancy, in the present study, was ampulla of the fallopian tube (43.37%). In other studies also the commonest site was ampulla of fallopian tube as shown in the Table 20.

Table 20: Ampulla, the commonest site of ectopic pregnancy-a comparison of studies

Study	Ampulla
Present study	**43.37%**
Shetty *et al.* [26]	45.2%
Wakankar *et al.* [31]	53.84%
Chate *et al.* [32]	51.6%
Mehta *et al.* [34]	42.05%

In developing countries majority of patients are diagnosed after tubal rupture and hemoperitoneum. In current study, fallopian tube was found ruptured in 85.55% which was comparable to the studies of Chate *et al*. and Majhi *et al*. who observed ruptured tube in 76.35% and 70.2% of patients respectively, whereas, Mehta *et al*. and Muftii *et al*. found ruptured tubal pregnancy in 55% and 60.52% of the patients respectively (Table 21).

Table 21: Comparison of condition of tube intra operatively

Study	Ruptured tube
Present study	**85.55%**
Muftii *et al.* [27]	60.52%
Chate *et al.* [32]	76.35%
Mehta *et al.* [34]	55%
Majhi *et al.* [36]	70.2%

In our study 76.5% of patients received blood transfusion, in which 63.26% received ≤ 2 units of blood transfusion and 13.28% received > than 2 units of blood and blood products. Our study was comparable to the study by Mehta *et al*. in which 52.5% patient required ≤ 2 units of transfusion and 7.5% required > 2 units of blood transfusion. A similar study by Ranji *et al*. showed that 19.32% patients required ≤ 2 units of transfusion and 8.40% required > 2 units of blood transfusion.

In India, majority of cases present late, either due to late diagnosis or delayed referral, consequently surgical management is the main stay of treatment. In present study, 82.6%, 16.3% and 2.04% were treated by surgical, medical and expectant management**,** respectively. There were 2 patients who had failed medical management and hence underwent surgery later on. Hence, total 84.69% patients were treated surgically. The similar findings were noticed in a study by Majhi *et al*. where 81.9%, 1.75% and 1.2% patients were managed surgically, medically and expectantly respectively. In studies by Mehta *et al*. and Muftii *et al*. no conservative management was done. They treated 51.25%, 65.78% and 2.5%, 1% of the patients with surgery and medical treatment, respectively.

Table 22: Comparison of type of management

Study	Surgical Rx	Medical Rx	Expectant Rx
Present study	**82.6%**	**16.3%**	**1.02%**
Shetty *et al.* [26]	90.3%	-	-
Muftii *et al.* [27]	65.78%	1%	-
Mehta *et al.* [34]	51.25%	2.5%	-
Majhi *et al.* [36]	81.9%	1.75%	1.2%

Ruptured ectopic pregnancy is an acute emergency in which the patient is usually hemodynamically unstable due to massive blood loss; immediate surgery with resuscitation, hand in hand, is lifesaving. Immediate resuscitation with intravenous fluids and blood and simultaneous emergency laparotomy with salpingectomy, conservation of the ovaries if possible, was done for the majority of our patients. Due to association of ruptured ectopic pregnancy with hemoperitoneum, unilateral salpingectomy with peritoneal toileting (75.90%) was the commonest emergency procedure performed in current study. On comparative analysis, it was found that the highest percentage of cases (90.3%) in which unilateral salpingectomy was done, were reported by Shetty *et al*. whereas, Gaddagi *et al*. reported the least percentage of cases (51.4%) treated by salpingectomy in their study [37].

There was no mortality in our study. This may be attributed to early referral, prompt diagnosis and better facilities in our institution with round the clock blood bank services. Similar observations were made by Mehta *et al*. and Majhi *et al*. in their studies. However, 1.5% of maternal deaths were reported by Gupta R *et al*. probably due to delayed referral from the peripheral hospitals. None of our patients underwent abdominal hysterectomy, whereas, Chate *et al*. reported that 5.4% patients underwent abdominal hysterectomy in their study.

Conclusion

Ectopic pregnancy is still a major challenge in obstetrical practice because of its bizarre clinical presentation and is one of the commonest causes of pregnancy related deaths in the first trimester. Tubal pregnancies are the most common ectopic pregnancies, ampulla being the most common site. Despite exhaustive efforts to prevent ectopic pregnancy the numbers are constantly rising. The rising incidence of ectopic pregnancies was also evident by the findings of this study. The risk of ectopic pregnancy shows definitive correlation with some traditional risk factors including previous ectopic pregnancy, previous infertility, previous adnexal surgery, previous/current use of IUDs, OCPs, and female sterilization.

Nowadays, with the diagnostic techniques, such as hormonal test, trans-vaginal sonography and laparoscopy early diagnosis of ectopic pregnancy is possible, contributing a sharp decrease in maternal mortality. Though medical or conservative surgical management is the choicest treatment of ectopic pregnancy these days, radical surgery or salpingectomy was the treatment modality which was adopted in the present study as a majority (80%) of the cases presented as ruptured ectopic pregnancy. Medical treatment is too having certain limitations of clinical criteria and cannot be offered to all. Ectopic gestations, other than tubal one, *viz.;* cervical, cornual, abdominal etc. may require different and/or more invasive treatment either excision by laparoscopy/laparotomy or even hysterectomy. High index of suspicion in a patient with risk factors, early diagnosis, and prompt treatment seems to be promising in reducing maternal morbidity and mortality in this catastrophe.

Funding: No funding sources.

Conflict of interest: None declared.

Ethical approval: The study was approved by the Institutional Ethics Committee.

References

1. Nama V, Manyoda I. Tubal Pregnancy: diagnosis and management. Arch Gynecol Obstet. 2009; 279:443.
2. TeLinde. Operative Gynecology. 10th ed. Lippincott-Raven, Philadelphia, 1997, 798.
3. Peter S Uzelac, Sara H Garmel. Current obstetric and gynaecologic diagnosis and treatment 10th ed. McGraw-Hill companies, 2007, 265-270.
4. De Cherney AH, Nathan L. Current obstetrics and

gynecology, diagnosis and treatment. 9ed New York: McGraw Hill Book Companies, 2003, 274.
5. Ratram SS, Bhasker K, Arul Kumaran S, Sivasuriya M. Ectopic pregnancy. Obstetrics and gynecology for post graduates. 1st ed. Orient Longman, 1999, 394-407.
6. Gary CF, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ, Spong CY. Williams obstetrics. Ectopic pregnancy. 23rd ed. The McGrew-Hill Companies, 2010, 238-254.
7. Akande V, Turner C, Horner P *et al*. British Fertility Society. Impact of chlamydia trochmatis in the reproductive setting: British Fertility Society Guidelines for practice. Hum Fertil (Camb). 2010; 13:115-125.
8. Westrom L, Joesoef R, Reynolds G, Hagdu A, Thompson SE. Pelvic inflammatory disease and fertility. Sex Trans Dis. 1992; 19:185.
9. Chi IC, Potts M, Wilkens L. Rare events associated with tubal sterilizations: An international experience. Obstet Gynecol. Surv. 1986; 41:7-19.
10. Dutta DC. Textbook of Obstetrics. 7th edition. Jaypee medical publishers. 2013; 15:177-189.
11. ACOG Practice Bulletin no. 94: Medical management of ectopic pregnancy. Obstet. Gynaecol. 2008; 111(6):1479-85.
12. Kadar N, De Vore G, Romero R. Discriminatory Hcg zone: Its use in the sonographic evaluation for ectopic pregnancy. Obstet Gynecol. 1981; 58:156-61.
13. American Institute of Ultrasound in Medicine. AIUM practice guideline for the performance of obstetric ultrasound examination Ultrasound Med. 2010; 29:157.
14. Barnhart KT, Sammel MD *et al*. Symptomatic patients with an early viable intrauterine pregnancy: HCG curvers redefined. Obstet Gynecol. 2004; 104:50-55.
15. Parker J, Bisitis A. Laparoscopic surgical treatment of ectopic pregnancy: salpingectomy or salphingostomy? Aust N Z J Obstet. Gynaecol. 1997; 37:115-117.
16. Condous G, Timmerman D *et al*. Pregnancies of unknown location: Consensus statement. Ultrasound. Obstet. Gynecol. 2006; 28:121-122.
17. Murphy AA, Nager CW, Wujek JJ *et al*. Operative Laparoscopy versus laparotomy for the management of ectopic pregnancy: a prospective trial. Fertil Steril. 1992; 57:1180-1185.
18. Bouyer J, Coste J, Fernandez H *et al*. Sites of ectopic pregnancy: A 10 year population based study of 1800 cases. Hum Reprod. 2002; 17:3224-3230.
19. Hallatt JG. Primary ovarian pregnancy: a report of twenty-five cases. Am J Obstet Gynecol. 1982; 143:55-60.
20. Spiegelberg O. Causistik der ovarial schwangerschaft. Arch Gynaecol. 1878; 13:73.
21. Hofmann HMH, Urdl W, Hofler H *et al*. Cervical pregnancy case reports and currebt concepts in diagnosis and treatment. Arch Gynecol. Obstet. 1987; 241:63-69.
22. Nolan TE, Chandler PE, Hess LW *et al*. Cervical pregnancy managed without hysterectomy. A case report. J Reprod Med. 1989; 34:241-243.
23. Nolan TE, Chandler PE, Hess LW *et al*. Cervical pregnancy managed without hysterectomy. A case report. J Reprod Med. 1989; 34:241-243.
24. Atrash HK, Friede A, Hogue CJR. Abdominal pregnancy in the United States: frequency and maternal mortality. Obstet Gynecol. 1987; 69:333-337.
25. Jurkovic D. Ectopic pregnancy. In: Edmonds DK, eds. Dewhurst's textbook of obstetrics and gynaecology, 8th edition. Blackwell Science, 2012, 76.
26. Nehra PC, Loginsky SJ. Pregnancy after vaginal hysterectomy. Obstet Gynecol. 1984; 64:735-737.
27. Mufti S, Rather S, Mufti S, Rangrez RA, Wasiqa K. Ectopic pregnancy: An analysis of 114 cases. JK-Pract. 2012; 17(4):20-3.
28. 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)305-309.
29. 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(16):1-3.
30. Prasanna B, Jhansi CB, Swathi K *et al*. A study on risk factors and clinical presentation of ectopic pregnancy in women attending a tertiary care centre. IAIM, 2016; 3(1):90-96.
31. Shivakumar HC, Umashankar KM, Ramaraju HE. Analysis of forty cases of ectopic pregnancies in tertiary care hospital in South India. Indian J Basic Appl. Med Res. 2013; 3(1):235-41.
32. Wakankar R, Kedar K. Ectopic Pregnancy-A rising trend. International Journal of scientific Study, 2015, 10-17.
33. Chate MT, Chate B, Chate K. Clinical study of ectopic pregnancy. Int. J Reprod. Contracept. Obstet. Gynecol. 2017; 6(8):3498-3501.
34. Tahmina S, Daniel M. Soloman. Clinical analysis of ectopic pregnancies in a tertiary care centre in southern India: A six-year retrospective study of ectopic pregnancies. Journal of Clinical and Diagnostic Research. 2016; 10(10):QC13-QC16.
35. Mehta A, Jawal Goel N, Ahuja M. Int. J Reprod. Contracept. Obstet. Gynecol. 2017; 6(12):5241-5246.
36. Ranji G, Rani G, Varshini S. Ectopic pregnancy: Risk factors, clinical presentation and management. J obstet. Gynecol. 2018; 68(6):487-492.
37. Majhi AK, Roy N, Karmakar KS, Banerjee PK. Ectopic pregnancy: An analysis of 180 cases. J Indian Med Assoc. 2007; 105(6):308-12.
38. Gaddagi RA, Chandrashekhar AP. A clinical study of ectopic pregnancy. J Clin. Diagn. Res. 2012; 6(5):867-869.