

Risk Factors and Outcome of Ectopic Pregnancy**Sajini B¹, Rani Lakshmi S², Reeba Sara Mathew³, Divya Sara Raju⁴****¹Associate Professor, Department of Obstetrics and Gynaecology, Government Medical College Hospital, Kottayam, Kerala****²Assistant Professor, Department of Obstetrics and Gynaecology, Government Medical College Hospital, Kottayam, Kerala****³Assistant Professor, Department of Obstetrics and Gynaecology, Government Medical College Hospital, Kottayam, Kerala****⁴Assistant Professor, Department of Obstetrics and Gynaecology, Government Medical College Hospital, Kottayam, Kerala****Received: 15-10-2022 / Revised: 15-11-2022 / Accepted: 08-12-2022****Corresponding author: Dr Divya Sara Raju****Conflict of interest: Nil****Abstract**

Background: Among the emergency conditions in Obstetrics and Gynaecology, Ectopic pregnancy stands apart from other with high morbidity and mortality. The incidence is increasing in the present days all over the world. Understanding the Risk factors, clinical presentation, diagnostic criteria to confirm its diagnosis, and initiating early surgical management is possible when a definite protocol is in practice in all the tertiary care Hospitals. Otherwise, it will jeopardize the future pregnancies in them.

Aims of the study: To study the Risk factors of Ectopic Pregnancy in patients admitted in Kottayam Medical College Hospital and to study their clinical presentations and outcome; to formulate a protocol for early diagnosis and surgical intervention.

Objectives of the study: To enumerate and find the prevalence of risk factors of Ectopic Pregnancy in patients admitted OBG department for Ectopic pregnancy; to describe the clinical features, diagnostic criteria and early surgical intervention.

Materials: 346 pregnant women with ectopic gestational sac were included in this retrospective study conducted at Government Medical College and Hospital, Kottayam, Kerala. Patients of all ages diagnosed with pregnancy on USG or on direct laparoscopic or laparotomy observation were included. Patients with symptoms of Ectopic Pregnancy like Nausea, Vomiting, Pain in the abdomen, diarrhoea, dizziness, sensitivity to light, indigestion, vaginal bleeding, referred pain to the shoulder and fatigability were included. Patient's demographic data and clinical variables like pain abdomen, vaginal bleeding, fever, dizziness, signs of rupture, ultrasonography, septicaemia and methods of treatment were recorded and analysed statistically.

Results: 346 medical records of pregnant women with ectopic pregnancy admitted in the Government Medical college Hospital, Kottayam between Jan 2021 to July 2022 were analysed retrospectively. The mean age was 25.24±3.65 years. 48/346 (13.87%) were aged 18 and 22 years, 62/346 (17.91%) aged between 23 and 26 years, 78/346 (22.54%) aged between 27 to 30 years (the age group with the highest incidence of the study), 69/346 (19.94%) aged between 31 to 34 years, 54/346 (15.60%) aged between 35 and 39 years and 35/346 patients (10.11%) aged between 40 and 45 years. Diabetes Mellitus was in 08/346 (02.31%), Hypertension was in 11/346 (03.17%), Hypothyroidism was in 32 (09.24%), Cardiac disease was in 06/346 (01.73%) and malnutrition was noted in 12/3465 (03.46%) of the patients.

Conclusions: The incidence of Ectopic Pregnancies is not uncommon even in today's Obstetrics practice. A high index of suspicion, early detection by screening of high-risk patients

and surgical intervention helps in reducing the morbidity and mortality of ectopic pregnancy. Early child bearing age groups are affected by ectopic pregnancies due to early marriage age in India. Delayed referrals, rupture of the ectopic, shock and blood volume loss and hemoperitoneum are factors caused delayed Hospital discharges.

Keywords: Cardiac disease, hypothyroidism, ectopic pregnancies, hemoperitoneum

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Introduction

Ectopic pregnancy (EP) is defined a pregnancy with its gestational sac itself outside the normal location that is uterus; which are fallopian tubes, ovaries, cervix, broad ligament and peritoneum. EP was first reported by Al-Zahrawi in the 11th century [1]. "EXTOPOS" was the Greek word from which the term "Ectopic" was derived which meant "out of place". The code of EP as per International Statistical classification of diseases (ICD-10) is diagnostic code O00 by and related health problems [2]. Basically, it is an Obstetrical emergency with an incidence of approximately 1-2% of all pregnancies with a high morbidity and mortality [3]. The risk factors of EP and incidence of EP has increased with more women undergoing ART and IVF, changing life styles in the society; advanced maternal age, tubal surgeries, pelvic inflammatory diseases, endometriosis, exposure to diethylstilbestrol (DES) in utero, oral contraceptives containing oestrogen, intrauterine device (IUD) usage, Tuberculosis of salphinx [9]. EP is suspected in women with history of amenorrhea, positive pregnancy test and absence of Intrauterine Gestational Sac (IUGS) on ultrasound [10]. Pregnancy of unknown location (PUL) may change to Intrauterine Pregnancy in 30% of the women after demonstration of IUGS in the normal location in the uterus [11]. But many EPs (50-70%) would terminate as miscarriages [12]. A minimum β -hCG rise of $\geq 35\%$ in 48 hours was used to diagnose IUP [13]. But a β -hCG rise of $< 35\%$ in 48 hours points to EP with a 96.2% Positive Predictive Value, 69.7% negative predictive value, and 80.2% overall accuracy [14]. In this context a

clinical study was contemplated at Government Medical College Hospital of Kottayam to study the Risk factors of Ectopic Pregnancy in patients admitted and to study their clinical presentations and outcome; to formulate a protocol for early diagnosis and surgical intervention

Materials and Methods

246 pregnant women with ectopic pregnancy attending the Department of OBG, Government Medical College, Kottayam, Kerala were included in this study. This was a descriptive Retrospective study where the data was collected from the medical records section of the Hospital was used. The period of study was between August 2021 and July 2022 after obtaining approval from the institute Review Board. The sample size was calculated using the formula: (Sample size 1) S1 for infinite population was calculated using the formula:

$$S = Z^2 \times P \times (1-P) \quad M2 \quad (1-P) \quad M2: \quad 346$$

The primary outcome of this study was reviewing the incidence of various risk factors of EP were noted and analysed. The Secondary Outcomes were analysing the clinical findings, USG findings and Laparoscopy and or Laparotomy findings will be observed in all the EP patients. The points of confirmation of the diagnosis and early surgical interventions and final outcome of such procedures were observed to formulate a protocol of management of EP in the Hospital. Patients were included as per the inclusion criteria and recruited. Previous case records from the Records section of the admitted EP patients in the OBG wards of Government Medical college Hospital, Kottayam, on all days

were scrutinized. Consent of Approval was obtained from the Medical Superintendent of the General hospital attached to the Kottayam Medical College, Kottayam, Kerala (As informed consent from patients is not possible). A proforma containing demographic details, age, of the patients, age of the gestation, history of IVF, presenting complaints, USG findings, and laparoscopy and/ or Laparotomy findings will be filled by the investigator.

Inclusion Criteria: Patients of all ages with a history suggestive of ectopic pregnancy, clinically, on USG or on direct laparoscopic or laparotomy observation were included. Patients with symptoms of Ectopic Pregnancy like Nausea, Vomiting, Pain in the abdomen, diarrhoea, dizziness, sensitivity to light, indigestion, vaginal bleeding, referred pain to the shoulder and fatigability were included.

Exclusion Criteria: Patients with incomplete clinical, USG diagnosis or laparoscopy/ laparotomy observation of EP were excluded. Patient's age, period of gestation, Weight, Height, Blood Pressure, BMI, Educational status, Hypertension, Diabetes Mellitus, History of Tuberculosis, Exercise habits were elicited. History of previous pelvic inflammatory diseases, oral contraceptive usage, exposure to diethylstilbestrol (DES) in utero, endometriosis, history of undergoing ART and IVF, changing life styles in the society, tubal surgeries, urinary symptoms, endometriosis, oral contraceptives containing oestrogen, intrauterine device (IUD) usage, Tuberculosis of salphinx were elicited.

Patients with Fever, Abdominal rigidity, rupture signs, Shock, signs of internal bleeding, Peritonitis, signs of Septicaemia, signs of internal bleeding were recorded. Lab Investigations such as Pregnancy test, serum β -hCG estimation were undertaken. Radiological Investigations performed were USG for presence or absence of Intrauterine Gestational Sac (IUGS), to detect Pregnancy of unknown location (PUL) on USG. Laparoscopy/ Laparotomy Findings

of all the patients with EP undergoing surgical procedures as part of management undertaken by the surgeon and intra operative findings were noted, recorded and analysed. The definitions used were: Patient was considered as primigravida when she is pregnant for the first time. Patient is considered as Multi gravid when she was pregnant earlier. The Maternal Outcomes in the present study were contemplated to include all the complications of EP, intrapartum complications, all types of EP outcomes, mode of surgical intervention, indications for ICU admission and duration of hospital stay will be included as maternal outcomes. Data entry was done by using Epidata software with quality checks such as range and consistency.

Statistical Analysis

Data was analyzed using SPSS version 19.0 software. Data was further screened with Box lox plot and histograms. Description of means, proportions, frequencies and rates of the given data for each variable was calculated. The prevalence will be presented as point estimate with 95% CI. The statistics were presented separately for different age groups and risk groups. Presence of Anaemia (yes / no) had been taken as an independent variable. Bivariate analysis will be done to compare each independent variable with the outcome variable and presented as OR and 95 % CI. Logistic regression analysis will be done as the prevalence was more than 10% with log link. For the Multiple logistic regression analysis, all variables were considered.

Results

The total number of patients' data was collected from 346 medical records available in the medical records section of the Government Medical college Hospital, Kottayam between Jan 2021 to July 2022. The youngest patient was aged 18 years and the eldest patient was aged 45 years. The mean age was 25.24 ± 3.65 years. There were 48/346 (13.87%) Patients aged between 18 and 22 years, 62/346 (17.91%)

patients aged between 23 and 26 years, 78/346 (22.54%) patients were aged between 27 to 30 years (the age group with the highest incidence of the study), 69/346 (19.94%) patients aged between 31 to 34 years, 54/346 (15.60%) patients between 35 and 39 years and 35/346 patients (10.11%) patients aged between 40 and 45 years (Table 1). There were 63/346 patients with BMI between 15 and 19, 98/346 (28.32%) patients with BMI between 20 and 25, 92/346 (26.58%) patients with BMI between 25 and 30 and

93/346 (28.32%) patients with BMI between 31 and 34 were observed (Table 1). Family history of EP was observed in 94/346 (27.16%) of the pregnant women in this study (Table 1). Diabetes Mellitus was noted in 08/346 (02.31%) of the patients. Hypertension was noted in 11/346 (03.17%) of the patients. Hypothyroidism was noted in 32 (09.24%) of the patients. Cardiac disease was noted in 06/346 (01.73%) of the patients. Malnutrition was noted in 12/346 (03.46%) of the patients (Table 1).

Table 1: Showing the Age incidence and demographic data of the subjects in the study (n-346).

Age in years →	18-22	23-26	27-30	31-34	35-39	40-45	Total
Observation ↓							
Number	48	62	78	69	54	35	346
Percentage	13.87	17.91	22.54	19.94	15.60	10.11	100
BMI	N %	N %	N %	N %	N %	N %	
15 to 19	06- 01.73	11- 03.17	16-04.62	14- 04.04	12- 03.46	04- 01.15	63- 18.20
20 to 25	11- 03.17	19- 05.49	24- 06.93	22-06.35	10-02.89	12- 03.46	98- 28.32
25 to 30	13- 03.75	16- 04.62	23- 6.64	15- 04.33	13- 03.75	12- 03.75	92- 26.58
31 to 34	18- 05.20	16- 04.62	15- 04.33	18- 05.20	19- 05.49	07- 02.02	93- 28.32
Family history	14- 04.04	18- 05.20	21-06.06	12-03.46	17-04.91	12-03.46	94- 27.16%
Diabetes	Nil	Nil	02-0.57	03-0.86	02- 0.57	01-0.28	08- 02.31
Hypertension	Nil	Nil	04- 01.15	04- 01.15	01-0.28	02-0.57	11- 03.17
Hypothyroidism	04- 01.15	06- 01.73	07- 02.02	09-02.60	5-01.44	02- 0.57	32- 09.24
Cardiac disease	01- 0.28-	Nil	02-0.57	Nil	01-0.28	02-0.571	06-01.73
Malnutrition	02-0.28	3-0.89	02-0.28	Nil	01-0.89	02- 0.28	12- 03.46
Previous abortions	06- 01.73	05-01.44	07-02.02	11-03.17	01-1.15	04-01.15	37- 10.69

Previous history of Caesarean sections was noted in 145/346 (41.90%) patients and no history of Caesarean sections was noted in 201/346 (58.09%) of the patients (Table 2). The obstetric score of the patients was tabulated in Table 2. An IVF was present in 17/346 (04.91%) of the patients. According to gestational age the subjects were classified and observed and tabulated in Table 2.

Table 2: Showing the Obstetric history of the subjects in the study (n-346)

Obstetric Observations	Number	Percentage
<u>Previous C/S</u>		
Yes	145	41.90
No	201	58.09
<u>Obstetric score</u>		
E1	11	03.17
G2A1	06	01.73
G2P1L1	57	16.47
G2P1A1L1	08	02.31
G2P2L1	09	02.60
G2P3L3	07	02.02
G3P1L1A1	19	05.49
G3P1L1A1	09	02.60
G3P1L1E1	08	02.31
G3P2L2	42	12.13
G4P2L2A1	03	0.86
G4P2L2A1	09	02.60
G4P3L3	09	02.60
G5P2L2E2	16	04.62
P1E1	08	02.31
P1L1A1E1	09	02.60
P1L1E1	14	04.04
P2L2	15	04.33
P2L2E1	16	04.62
P3L3E1	08	02.31
Primi	53	15.31
<u>IVF</u>		
Yes	17	04.91
No	329	95.06
<u>Gestational Age in weeks</u>		
4 to 6 weeks	38	10.98
7 to 9 weeks	94	27.16
10 to 12 weeks	68	19.65
13 to 15 Weeks	37	10.69
15 to 17 weeks	38	10.98
18 to 20 weeks	45	13.00
21 to 13 weeks1	26	07.51

Risk factors causing EP were observed in the study and noted that Tuberculosis Salphinx was noted in 19/346 (05.498%) of the total cases. Previous tubal surgery was noted in 24/346 (06.93%) patients, Previous peritonitis was present in 32/346 (09.24%) patients, Contraceptives usage was found in 28/346 (08.09%) patients, IUD usage was noted in 21/346 (06.06%) of the patients, Exposure to DES was noted in 12/346 (03.46%) patients. Pelvic Inflammatory disease was noted in 16/346 (04.62%) patients. In the present study at least one risk factor was present in 44.50% of the pregnant women with EP (Table 3).

Table 3: Showing the risk factors for Ectopic gestation in the study (n-346)

Age groups in Years	TB Salpinx	Previous tubal surgery	Previous Peritonitis	Contraceptive usage	IUD usage	Exposure to DES	PID
18-22	00	00	01	01	00	00	00
23-26	01	02	05	04	02	00	01
27-30	06	06	08	11	06	04	05
31-34	05	06	08	08	09	06	06
35-39	03	07	04	03	04	02	04
40-45	04	03	06	01	00	00	00
Total	19-5.49%	24-6.93%	32- 09.24	28- 08.09	21- 6.06	12-3.46	16- 4.62

The commonest symptom of clinical presentation of EP in this study was Abdominal pain in 296 (85.54%) patients, Amenorrhea in 216 (62.42%) patients and Bleeding from vagina in 210 (60.69%) patients. The other symptoms noted were Dizziness in 71/346 (20.52%) patients, Fever in 42/346 (12.13%) patients, abdominal guarding was noted in 33/346 (09.53%) patients, Fatigability in 25/346 (07.22%) of the patients, Diarrhea in 04/346 (01.13%) patients and abdominal mass noted in 05/346 (01.44%) patients (Table 4).

Table 4: Showing the Symptoms and signs in the subjects of the study (n-346)

Symptoms	Number	Percentage
Abdominal Pain	296	85.54
Amenorrhea	216	62.42
Bleeding from Vagina	210	60.69
Dizziness	71	20.52
Fever	42	12.13
Abdominal Guarding	33	09.53
Fatigability	25	07.22
Referred pain to shoulder	08	02.31
Sensitivity to light	07	02.02
Indigestion	06	01.73
Diarrhea	04	01.15
Abdominal Mass	05	01.44

The site of Ectopic pregnancy was observed in this study and noted that tubal pregnancy was the commonest site with 119/346 (34.39%) in the left tube and 172/346 (49.71%) in the right tube. Ampullary EP was noted in right tube in 21/346 (06.06%) patients and in the left tubal ampulla in 08/346 (02.31%) patients, Scar ectopic was noted in 16/346 (04.62%) patients, EP was noted in the isthmus in 05/346 (01.44%) of the patients and ovarian EP was noted in 05/346 (01.44%) patients (Table 5).

Table 5: Showing the incidence of Site of ectopic pregnancy (n-346)

Site of Ectopic	Number	Percentage	Total
Tubal			
Left	119	34.39	291- 84.10
Right	172	49.71	
Ampullary-29			
Left	008	02.31	29- 08.38
Right	021	06.06	
Scar ectopic pregnancy	016	04.62	16- 04.62
Isthmus	005	01.44	05- 01.44
Ovarian	005	01.44	05- 01.44
Total	346	100	346-100

In this study ruptured tubal EP was noted in 89/346 (25.72%) patients, ovarian pregnancy in 06/346 (01.73%) and un-ruptured EP was noted in 251/346 (72.54%) patients (Table 6).

Table 6: Showing the incidence of rupture of Ectopic pregnancies in the study (n-346)

Termination of EP	Number	Percentage
Un-ruptured tubal	251	72.54
Rupture	089	25.72
Ovarian pregnancy	006	01.73

The operative findings in the study were observed and noted that tubal abortion was present in the right fallopian tube in 172/346 (49.71%) of the patients, in left fallopian tube in 141 (40.75%) patients. Live ectopic pregnancy was noted in 09/346 (02.60%) patients, ruptured ovarian ectopic was found in 04/346 (01.15%) patients and scar ectopic was noted in 20/346 patients (Table 7).

Table 7: Showing the nature of clinical presentation of Ectopic pregnancy (n-346)

Type of clinical presentation	Number	Percentage
Tubal abortion		
Left	141	40.75
Right	172	49.71
Scar Ectopic	20	05.78
Live Ectopic	09	02.60
Ruptured Ovarian Ectopic	04	01.15

Complications observed in the study were tabulated in Table 8 below. It showed rupture in 89 (25.72%) patients, septicaemia noted in 41 (11.84%) patients, ICU admission was noted in 31 (08.95%) patients and tubo-ovarian mass was noted in 28 (08.09%) patients. The number of patients requiring blood transfusion was 25 (07.22%) in the study (Table 8).

Table 8: Showing the incidence of Ectopic gestation presenting with complications (n-189/346)

Complication	Number	Percentage
Shock	111	32.08
Rupture	89	25.72
Septicaemia	41	11.84
ICU admission	31	08.95
Tubo- ovarian mass	28	08.09
Requiring Blood transfusion	25	07.22

In this study medical management with methotrexate was used in 55/346 (15.89%) patients. Laparotomy was used to evacuate the EP mass in 148/346 (42.77%) patients and Laparoscopic excision was done in 143/346 (41.32%) of the patients (Table 9).

Table 9: Showing the Treatment modalities used in the study (n-346)

Mode of management	Number	Percentage
Medical management with Methotrexate	055	15.89
Laparotomy	148	42.77
Laparoscopic excision	143	41.32

The operative procedures undertaken in the study were tabulated in the Table 10 below. Linear Salpingectomy was done in 76 (21.96%) patients; Partial Salpingectomy was done in 73 (21.09%) patients. Complete Salpingectomy was done in 58 (16.76%) patients, Salpingo-oophorectomy was done in 41 (11.84%) patients, milking was used in 35 (10.11%) patients and Uterine/ corneal/ horn reconstruction was undertaken in 11 (03.17%) patients (Table 10).

Table 10: Showing the line of surgical management undertaken in the study (n-346)

Line of management	Number	Percentage
Linear Salpingectomy	76	21.96
Partial Salpingectomy	73	21.09
Complete Salpingectomy	58	16.76
Salphingo-oophorectomy	41	11.84
Milking	35	10.11
Uterine/corneal/horn reconstruction	11	03.17

The final outcome was successful in 226 (65.61%) of the patients, prolonged hospital stay was noted in 86 (24.85%) patients, wound dehiscence was noted in 11 (03.17%) patients and failure of surgery and repeat procedure was noted in 23 (06.64%) patients (Table 11). The final outcome was highly significant statistically as the success rate was good in the study (p value less than 0.05)

Table 11: Showing the Final outcome of the treatments adopted for Ectopic gestations in the study (n-346).

Final outcome	Number	Percentage	P value
Successfully discharge	226	65.31	--
Prolonged Hospital stay More than 2 weeks	086	24.85	---
Wound dehiscence	011	03.17	--
Failure surgery	023	06.64	--
Total	346	100	0.001

Discussion

Ectopic Pregnancy (EP) is defined as a clinical condition wherein a fertilized egg starts growing outside its normal environment of the uterus and grows in one of the fallopian tubes. Clinically characterized by sharp pain on one side of the abdomen, bleeding from the vagina, shoulder pain, feeling of dizziness or fainting and sometimes abdominal guarding. In India EP accounts for nearly 3.5 to 7.1% of the total maternal mortality causes? The incidence of EP was found to be 0.83% in the present study; the total pregnant women who attended the Hospital over the study period were 41316 out of which 346 presented with EP. This finding was also in agreement with similar studies from most of the developed countries where the incidence varied from 0.56-1.5% (1 to 3, 5, 6, 9 and 10).

EP accounts for a significant mortality in the first trimester and needs immediate accurate diagnosis and prompt surgical intervention to reduce the morbidity and mortality in pregnant women [14-17]. It is

a significant cause of mortality in the first trimester. Timely referral to a higher centre is imperative in order to reduce mortality and morbidity. In the present study the highest incidence of EP, 78/346 (25.4%) was noted in the age group of 27 to 30 years. Pal *et al.* showed that the incidence was maximum in the 26-30 years of age group (37.6%), [18]. Some other studies showed that most of the patients in their study belonged to 21-30 age groups [11-13]. EP could occur in a married child bearing age of a woman. In India due to early marriage younger women groups are affected with EP. The classical triad of abdominal pain, amenorrhoea and vaginal bleeding was observed in 85.54%, 62.42% and 60.69% respectively among the patients in this study. Singh S, Mahendra G *et al.*, and Baria D, Thaker R, Patel M *et al.*, from their studies reported this triad of symptoms in 28-95% women [1,18].

The difference in the incidence of presenting symptoms showed that the triad may not be a prominent feature in most

patients, but history Amenorrhea is always present; but Amenorrhea may not be revealed unless inquired into carefully. In the present study the incidence of Amenorrhea was elicited in 62.42% of the patients. Singh *et al.*, reported that 52% of their cases did not have preceding amenorrhoea [1]. It was observed by many Obstetricians that few women may be not aware of an ongoing pregnancy; hence may not anticipate a pregnancy complication. Usually, they are seen by family physicians first or by a general practitioner and so the importance of careful history-taking is a must.

The mean gestational age observed in the study was $7.46 \pm 2.4.85$ weeks. Khaleeque *et al.*, [2] observed the mean gestational age as 6 weeks. In the present study at least one risk factor was present in 44.50% of the pregnant women with EP (Table 3). Among the risk factors, family history, previous history of peritonitis, tubal pathology and previous pelvic surgery were the commonest (Table 3). The studies by Singh *et al.*, [1], Khaleeque F *et al* [2] and Gaskin's J *et al.*, [13] concluded that in their studies of EP, at least one risk factor was present; among other risk factors, previous pelvic surgery was the commonest accounting to 37.5% which was followed by previous abortions in 36.1%. Studies from various regions [1-3,9,12-14] have reported a similarly high incidence of previous abortions, but in contrast in this study 37/346 pregnant women had history of previous abortions (10.69%), (Table 1).

Other causes found in literature were previous caesarean sections and tubal surgeries [16]. Singh *et al.*, [1] also reported from their study that prior tubal surgery was the most common (40%) risk factor. This could be explained by the fact that in general population the high acceptance of tubal sterilization as a mode of family planning [16, 1]. Hence it was found that performing a pregnancy test in all married childbearing women irrespective of their sterilisation status should be practiced.

Pregnancy must be ruled out in women of childbearing age as a pretext.

Pelvic Inflammatory Disease was found in 16/346 (04.62%) of the pregnant women in this study (Table 3). Whereas, Taheri M, Bharathan R *et al.*, reported PID as the risk factor in 15.3% of their patients with EP [19]. But the incidence of PID was similar to our study when compared to the studies of Singh *et al.*, and Mufti *et al.*, in their studies [1,15]. Few researchers from Nigeria [20] explained the higher incidence of PID, by the fact that the incidence of polygamy was also found to be higher in Nigeria [3,5,6].

Lakshmi Nair, Nirmala Peter *et al.*, [21] observed that, clinical symptoms alone and preliminary clinical examination of pregnant women would make the Obstetrician suspicious of EP in them but would not confirm the diagnosis; in their study the diagnosis missed was about 38.9% [20]. Ultrasound examination of abdomen and pelvis the diagnosis was useful in confirming the diagnosis in most of such patients, with the exception of three instances where the need for laparoscopy, culdocentesis and abdominal paracentesis had been used frequently to help in the diagnosis [3,5,6,17]. The fallopian tubes were the most common seat of EP (84.10%) in this study. Most studies reported a higher incidence of EP in the right tube [1,3,6,10,22]. Among the tubal EP 34.39% were on the left fallopian tube and 49.71% on the right side in this study (Table 5).

In most of the developing countries tubal rupture was diagnosed after the rupture but in this study 89 (25.72%) were diagnosed after the rupture of tubal EP. These patients presented with hemoperitoneum at the time of surgery. Some studies in the literature have reported as high as 70-100% of EP patients presented with rupture at the time of admission and diagnosis [23]. Shock was present in 111 (32.08%) of the pregnant women with EP in the study. In a study by Rashmi A, Gaddagi Ra *et al.*, [24] 40.5% of their patients were in shock when presented to the OBG emergencies.

Chandrasekhar In the present study 25 (07.22%) patients required blood transfusion. In a study by Cornelius AC, Onyegbule A *et al.*, [25] 59.7% of their patients required blood transfusion, which was in contrast with the present study. Similar reports were presented by other authors also [2,9,10]. Udigwe *et al.*, [16] reported a 94.4% need for blood transfusion. The mean hospital stay in this study was 7.1 ± 3.15 days but 86 (24.85%) patients had a prolonged Hospital stay with a mean of 16.24 ± 4.25 days.

A study conducted by Udigwe *et al.*, showed in 94.4% of their patients the hospital stay was less than 8 days, while 5.6% of the women needed prolonged hospitalisation up to 14 days [3]. Complications observed were rupture in 89 (25.72%) patients, septicaemia noted in 41 (11.84%) patients, ICU admission was noted in 31 (08.95%) patients and tubo-ovarian mass was noted in 28 (08.09%) patients. The number of patients requiring blood transfusion was 25 (07.22%) in the study (Table 8).

In this study medical management with methotrexate was used in 55/346 (15.89%) patients. The remaining patients (84.11%) were managed by surgery. Laparotomy was used to evacuate the EP mass in 148/346 (42.77%) patients and Laparoscopic excision was done in 143/346 (41.32%) of the patients (Table 9). Tahmina S, Daniel M, Solomon P *et al.*, [26] from their study observed that 86.1% of the patients were managed by surgery. Recent study comparing the laporotomy versus laparoscopic surgical treatment for EP patients, observed that in terms of tubal patency and intrauterine pregnancy rates, there was no advantage of one over the other [27]. Many of the studies reviewed also showed a higher incidence of surgical treatment as the choice for patients with EP [2,3,6,9,20].

But the trends of decreasing number of patients treated with surgical methods for EP were observed by Taheri *et al.*, from 98% to 62% [28] and by van den Berg *et*

al., from 50% to 27% [29], both forthcoming from the developed countries like United Kingdom over the past two decades. This could be explained by the fact that UK developed Early Pregnancy Assessment Units (EPAU) which was diagnosing EP at a very early stage where medical management was plausible. There were no deaths among the 346 patients enrolled for a study of Ectopic Pregnancy in this institute. Various reports [2,3,5,6,9,20] showed a mortality rate between 0% and 1.3%.

In those reports the main cause of death was shown as haemorrhage and shock following rupture of EP diagnosed late due to referrals and transport delays. Preventive measures such as early transvaginal ultrasonography to confirm the location of pregnancy has to be encouraged in women. Other preventive measures should include diagnosis and prompt treatment of PID. Searching the feasibility to Set up EPAU units in India might decrease the prevalence of Ectopic Pregnancies.

Training the doctors in the peripheral hospitals to perform Ultrasonography for diagnosing and evaluating EP at early stage would help in reducing the mortality further. The present study was limited by its retrospective nature and assessing the causes for delay in delivery of essential treatment at appropriate point could not be accurately estimated.

Conclusions

The incidence of Ectopic Pregnancies is not uncommon even in today's Obstetrics practice. A high index of suspicion, early detection by screening of high-risk patients and surgical intervention helps in reducing the morbidity and mortality of ectopic pregnancy. Early child bearing age groups are affected by ectopic pregnancies due to early marriage age in India. Delayed referrals, rupture of the ectopic, shock and blood volume loss and hemoperitoneum are factors caused delayed Hospital discharges.

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