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Clinicopathologic Correlation of Tubal Ectopic Pregnancies in a Tertiary Hospital of Mandya: A Retrospective Study

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ABSTRACT
Ectopic pregnancy is implantation and development of zygote outside the uterine endometrial cavity. It is one of the foremost causes of maternal morbidity and mortality in first trimester of pregnancy. This study was done to review all cases submitted to histopathology laboratory with diagnosis of ectopic pregnancy for clinicopathologic correlation. A retrospective study was done in Department of Pathology, Mandya Institute of Medical Sciences, Mandya, Karnataka, India by collecting data from March 2021 to April 2023 by including all the specimens of ectopic pregnancies submitted to histopathology lab. Total 62 samples were submitted with the clinical diagnosis of ectopic pregnancy in the period of 2 years. The commonest age group was between 19-40 years. Most women were between 21-30 years. Details of risk factors were available in 51 cases. Most included pelvic inflammatory disease (49%) followed by history of abortion (27%), polycystic ovarian disease and assisted reproduction accounting to total of 10%. In all 62 cases there were almost equal distribution of EP involving left (51%) and right (49%) fallopian tube. Ectopic pregnancy is a life-threatening emergency associated with maternal morbidity and mortality in early pregnancy. Common risk factors were pelvic inflammatory disease, abortions, tubal surgery and assisted infertility treatments and adverse sequelae of extra pulmonary tuberculosis. Therefore, early diagnosis, prompt intervention and targeted health education for susceptible women needs to be promoted.

INTRODUCTION

Ectopic pregnancy is defined as implantation and subsequent development of the zygote outside the uterine endometrial cavity[1]. It is one of the foremost causes of maternal morbidity and mortality in the first trimester of pregnancy and one of the indications for emergency laparotomy[2,3]. Early and timely diagnosis is crucial as patients are confronted with late presentation and rupture in majority of the cases[2,3]. Ectopic pregnancy affects approximately 1% of all pregnancies[4]. Worldwide, the increasing incidence of ectopic pregnancy is 1-2%[3]. With the early diagnosis and intervention, the reported maternal mortality rate from EP has reduced from 7.1-3.5% as per reports from various parts of India[3,5]. Regardless of new diagnostic methods available, still significant proportion of women present late to medical care as they remain asymptomatic till they rupture[6]. Fallopian tube (91.5%) is the most common site of ectopic pregnancy followed by caesarean scar (6.7%), ovary (0.6%), cervix (0.4%) and abdomen (0.8%)[4]. Pelvic inflammatory diseases continues to be the most common risk factor for ectopic pregnancy. The other risk factors include intrauterine contraceptive device, previous tubal surgery, infertility, previous abortions, assisted reproductive techniques, use of progesterone only pills and endometriosis[2,3]. Identification of trophoblastic tissue by histopathological examination is essential for confirmation of diagnosis and to differentiate hematosalpinx and ruptured haemorrhagic corpus luteum which can have similar clinical presentation[3]. This study was done to review all the cases submitted for histopathology with the diagnosis of tubal ectopic pregnancy with clinicopathologic co-relation with respect to maternal age, parity, underlying risk factor and estimate the percentage of confirmed cases based on histopathological examination.

MATERIALS AND METHODS

A hospital record based retrospective observational study done in Department of Pathology, Mandya Institute of Medical Sciences, Mandya, Karnataka, India. The data collected from March 2021 to April 2023 was retrospectively analysed, after obtaining approval from the Institutional Ethics Committee (IEC application no MIMS/IEC/2023/721).

Inclusion criteria: All the specimens with clinical diagnosis of ectopic pregnancies submitted to histopathology lab were included in the study.

Study procedure: The clinical details like age of the patient, parity, gestational age and associated risk factors for ectopic pregnancy were obtained from patient requisition forms and medical records.

Haematoxylin and Eosin (H and E) slides of all these cases were reviewed for the confirmation of trophoblastic tissue.

Sample size: Cases in the past two years from March 2021 to April 2023.

Sampling technique: Simple descriptive statistics and percentage method.

RESULTS

A total of 62 samples with a clinical diagnosis of ectopic pregnancy in the two year study period were reviewed and clinicopathologic correlation done. The age range was between 19-40 years with the mean and standard deviation of 28±6.12 years. Majority of the women (70.97%), were between 21-30 years (Table 1). The details of parity were known in 60 cases with most women (38.4%) in third pregnancy (Table 2). Most of the women (22.22%) presented in seventh week of gestation followed by 27.8% after eight weeks of gestation (Table 3). The mean gestational age was 7.4 weeks. The details of risk factors were available in 51 cases (Table 4). In the presented study all the 62 cases were tubal ectopic pregnancy with almost equal distribution involving both left (51%) and right (49%) fallopian tubes.

The most frequently identified risk factor was pelvic inflammatory disease (49%) followed by history of abortion (27%) (Fig. 1). History assisted reproductive techniques for infertility accounted to 5 cases (10%) amongst which 4 cases were polycystic ovarian disease. Two cases of ectopic pregnancy had history of recanalization. One case of extrapulmonary tuberculosis presented with ectopic pregnancy and one case presented. A 30-year-old female with gravida 5 para 2 presented with recurrent ectopic pregnancy in left fallopian tube. One case each with history of

Table 1: Showing age distribution in years (n = 62)

<20	4 (6.45%)
21-30	44 (70.97%)
31-40	14 (22.58%)

Mean age: 28 years

Table 2: Showing frequency distribution of parity (n = 60)

0	15 (25%)
1	15 (25%)
2	23 (38.3%)
>3	7(11.7%)

Table 3: Showing gestational age in weeks at the time of presentation (n = 36)

4	3 (8.3%)
5	5 (13.8%)
6	5 (13.8%)
7	8 (22.2%)
8	5 (13.8%)
>8	10 (27.8%)

Mean gestational age: 7.4 weeks

Table 4: Showing associated risk factors and their frequency (n = 51)

History of PID	25 (49%)
History of abortion	14 (27%)
History of PCOD	4 (8%)
History of tubal recanalisation	2 (4%)
History of treatment for infertility	1 (2%)
History of tubectomy	1 (2%)
History of previous ectopic	1 (2%)
History of extra pulmonary tuberculosis	1 (2%)
History of unilateral salpingo-oophorectomy	1 (2%)
Left ovary-operated dermoid, Right ovary-chronic retention cyst	1 (2%)

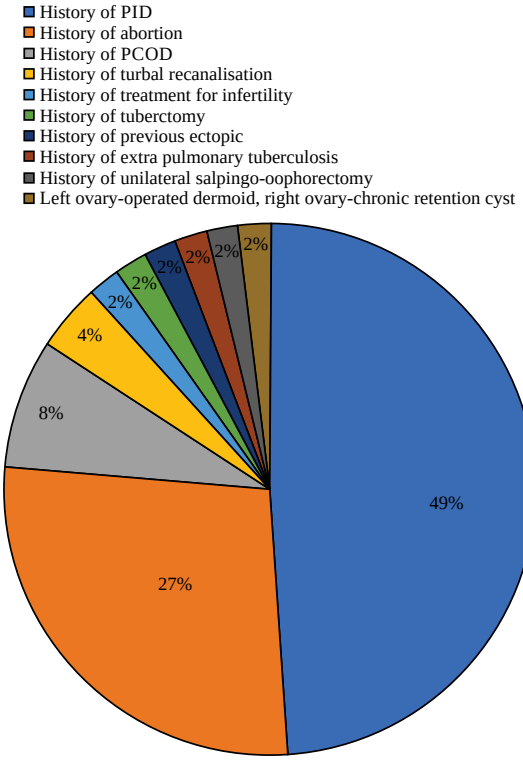

Fig. 1: Showing the percentage of risk factors for tubal ectopic pregnancy in the present study

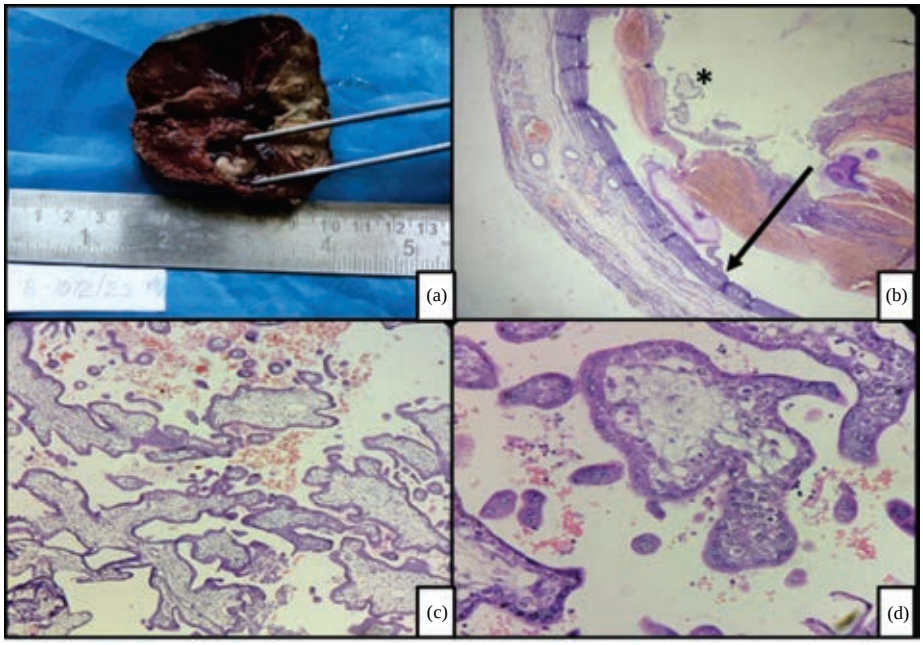

Fig. 2(a-d): (a) Gross picture showing dilated lumen of the fallopian tube along with blood clot and foetus, (b) Chorionic villi (*) inside the fallopian tube (arrow) (H and E, 40X), (c) chorionic villi with vascular core (H and E, 100X) and (d) Cytotrophoblast and syncytiotrphoblast (H and E, 400X)

tubectomy and unilateral salpingo-oophorectomy were noted. One case of ectopic pregnancy in right fallopian tube had a chronic retention cyst in the right ovary along with history of dermoid cyst in the left ovary, which was operated.

On gross examination, the tube was ruptured and haemorrhagic in 20 (32.3%) cases and unruptured in 44(67.7%). Grossly identifiable villi and foetus were occasionally noted (Fig. 2a). On histopathological examination, of the 62 cases,

Table 5: Showing maternal age in the present study with comparison to other studies

Maternal age (years)	Present study (n = 62)	Ononuju *et al*.[2] (n = 93)	Nath *et al*.[5] (n = 185)	Dheepthikaa and Murugan[6] (n = 56)	Govada *et al*.[3] (n = 128)	Bhuria *et al*.[7] (n = 169)
<20	4 (6.45%)	19 (20.4%)	10 (5.7%)	3 (5.3%)	12 (9.3%)	1 (0.59%)
21-30	44 (70.97%)	27 (29%)	101 (57.7%)	36 (64.3%)	97 (75.7%)	149 (88%)
31-40	14 (22.58%)	46 (49.7%)	69 (39.42%)	3 (5.3%)	19 (14.8%)	18 (10.5%)
>40	-	1 (1.1%)	5 (2.87%)	-	-	1 (0.59%)
Mean age	28 years	-	-	-	25.8 years	-

Table 6: showing the distribution of parity in the present study with comparison to other studies

Parity	Present study (n = 60)	Ononuju *et al*.[2] (n = 93)	Nath *et al*.[5] (n = 185)	Govada *et al*.[3] (n = 86)	Bhuria *et al*.[7] (n = 169)
0	15 (25%)	30 (32.3%)	60 (34.3%)	23 (26.7%)	33 (19.53%)
1	15 (25%)	20 (21.5%)	38 (21.7%)	10 (11.6%)	72 (42.6%)
2	23 (38.3%)	16 (17.2%)	30 (17.1%)	40 (46.5%)	16 (9.5%)
>3	7 (11.7%)	27 (29%)	47 (26.9%)	13 (15.1%)	11 (6.5%)

Table 7: Showing gestational age at the time of presentation in the present study with comparison to other studies

Gestational age (weeks)	Present study (N = 36)	Govada *et al*.[3] (N = 78)	Bhuria *et al*.[7] (N = 169)
4	3 (8.3%)	-	43 (25.4%)
5	5 (13.8%)	7 (8.9%)	
6	5 (13.8%)	28 (35.8%)	
7	8 (22.2%)	7 (8.9%)	126 (74.6%)
8	5 (13.8%)	14 (17.9%)	
>8	10 (27.8%)	22 (28.2%)	
Mean gestational age	7.4 weeks	7.2 weeks	

trophoblastic tissue was identified in 59 (95.2%) cases (Fig. 2 b-d). Remaining 3 (4.8%) cases showed only hematosalpinx.

DISCUSSIONS

Ectopic pregnancy is potentially a life-threatening emergency in obstetrics. It is one of the important contributors to maternal morbidity and mortality in the first trimester of pregnancy. The incidence of ectopic pregnancy in India as reported by Indian Council of Medical Research task force is 3.12 per 1000 pregnancies[6].

In the present study, the most common age group was 21-30 years (70.97% of cases) which is similar to other reported studies (Table 5)[3,5-6]. Majority of the cases were in third pregnancy (38.3% of cases) which is comparable to study by Govada *et al*.[3] (46.5% of cases). In the studies by Ononuju *et al*.[2] and Nath *et al*.[5] most of the women were nulliparous (32.3 and 34.3%) of cases respectively (Table 6). Most women presented in seventh week of gestation (22.2% of cases) in the present study. Govada *et al*.[3] have reported majority of the cases in sixth week of gestation (35.8% of cases). In a study by Bhuria *et al*.[7], most cases (74.6% of cases) presented at a gestational age of more than 7-8 weeks (Table 7). In the present study, the fallopian tube was the site of ectopic gestation in all the 62 cases reviewed. The left fallopian tube with 51% of cases and right with 49% of cases were involved. Among these 32.3% of cases presented with rupture. Govada *et al*.[3] in their study reported fallopian tube as the most common site for ectopic pregnancy (99.1% of cases) and right fallopian tube with 52.2% of cases and left with 46.9% of cases. In the study done by Pradhan *et al*.[8] and other authors and Govada *et al*.[3], the fallopian tube was ruptured in 42.5 and 59.3% of cases, respectively.

In our study, on histopathological examination, trophoblastic tissue was identified in 95.2% of cases. 4.8% of cases showed hematosalpinx. Govada *et al*.[3] have reported histopathological confirmation of ectopic gestation 90.6% of cases and rest 9.4% of cases were other non-gestational tubal pathology. Pradhan *et al*.[8] noted histopathological confirmation in 85% of the cases.

The most common risk factor observed in our study was pelvic inflammatory disease in 49% of cases (Fig. 1) followed by history of abortion in 27% of cases. Ectopic pregnancy following assisted infertility intervention for polycystic ovarian disease and primary infertility were seen in 10% of cases. Post-tubectomy and following tubal recanalization, ectopic pregnancy were identified in 2 and 4% of cases, respectively. In 4% of cases past history of unilateral salpingo-oophorectomy was noted. Two percent of the cases had history of previous ectopic pregnancy. One case of extrapulmonary tubercuolosis presented with ectopic pregnancy in our study. In the studies by Singh and Dangal[9] and Ghimire[10] pelvic inflammatory disease was the commonest risk factor (Table 8). Ononju *et al*.[2] and Majhi *et al*.[11] noted history of abortion in 32.2 and 26.10% of cases respectively. Govada *et al*.[3] in their study have noted 43.9% of ectopic pregnancy with previous history of abortion. Ectopic pregnancy following assisted infertility treatment as reported in the studies by Ononju *et al*.[2], Majhi *et al*.[11] were 12%, while Dheepthikaa and Murugan[6] had reported 10% of cases. Kathpalia *et al*.[1] reported 71.7% of cases with history of treatment for infertility (Table 8). Ectopic pregnancy following tubal surgeries have been reported by Kathpalia *et al*.[1] and Govada *et al*.[3] with 1.25 and 6% of cases respectively while Dheepthikaa and Murugan[6] have reported in 39.3% of cases. In

Table 8: Showing the frequencies of various risk factors in the present study with comparison to other studies

Risk factors	Present study (n = 51)	Kathpalia *et al*.[1] (n = 80)	Ononuju *et al*.[2] (n = 93)	Nath *et al*.[5] (n = 185)	Dheepthikaa and Murugan[6] (n = 56)	Govada *et al*.[3] (n = 82)	Bhuria *et al*.[7] (n = 86)	Singh and Dangal[9] —	Majhi *et al*.[11] (n = 180)	Pradhan *et al*.[8] (n = 36)	Ghimire[10] —
History of PID	25 (49%)	9(11.2%)	—	38 (21.7%)	9 (16.1%)	—	6 (6.9%)	76.60%	12.80%	13.90%	65%
History of abortion	14 (27%)	11(11.7%)	30(32.2%)	75 (40%)	2 (3.6%)	36(43.9%)	32 (37.2%)	36.70%	26.10%		13.30%
History of treatment for infertility	1 (2%)	71(71.7%)	12(12.9%)	—	6 (10.7%)	5(6%)	3 (3.5%)	—	12.20%	33.30%	—
History of previous ectopic	1 (2%)	2 (2.5%)	10(10.8%)	52 (29.7%)	3 (5.4%)	—	7 (8.13%)	—	—	16.70%	—
History of laprotomy											
History of tubectomy	1 (2%)	1(1.25%)	14(15.1%)	43 (24.6%)	22 (39.3%)	5(6%)	38 (44.1%)	—	14.40%	13.90%	—
History of tubal recanalisation	2 (4%)	1(1.2%)			-	-		-	-	-	-
Others	2 (4%)	3 (3.5%)			—	—	—	26.70%	11.10%	—	—

patients following myomectomy and appendectopmy, Kathpalia *et al*.[1] noted 3.5% of cases. Kathpalia *et al*.[1] and Dheepthikaa and Murugan[6] have reported 2.5% and 5.4% of cases with history of previous ectopic pregnancy. Genital tuberculosis represents 15-20% of extrapulmonary tuberculosis[12]. In the study done by Hooda *et al*.[13], the prevalence of genital tuberculosis with ectopic pregnancy was 16.18% of the cases.

CONCLUSION

Ectopic pregnancy is a life-threatening emergency with considerable maternal morbidity and mortality in early pregnancy. Emphasis on identifying high risk factors, detailed history and thorough clinicopathologic correlation is a must. We found that ectopic pregnancy was most common in 21-30 years age group and multiparous women with mean gestational age of 7.4 weeks. The common risk factors were pelvic inflammatory disease, abortions, tubal surgery and assisted infertility treatments and adverse sequelae of extra pulmonary tuberculosis. Tubal rupture at clinical presentation were noted in 32% of cases. Therefore, early detection of cases with appropriate diagnostic modalities is significant for timely management. Targeted health education to susceptible group of women needs to be promoted.

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