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# Histomorphological study on Ectopic pregnancies in a tertiary care obstetrics centre – a retrospective 5year study.

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## Abstract

**Background:** Ectopic pregnancies are leading cause of maternal mortality in developing countries like India with incidence of more than 2%. The most common sites of ectopic pregnancy are fallopian tube with incidence rate of 95%, other 5% includes rare sites like cervix, ovary, abdominal pregnancy, previous caesarean scar pregnancy, cornual or interstitial pregnancy and intramural pregnancy. The aim of this study was to determine the incidence of ectopic pregnancy, age, laterality, various sites and mode of treatment.

**Methodology & Results:** A retrospective study was conducted in the department of pathology, Institute of Obstetrics and Gynecology, Egmore, Chennai over a period of 5years from Feb 2015 to Feb 2019. Out of 63720 deliveries 379 were ectopic pregnancies. Majority of cases were in the age group of 21-30yrs (68.60%) with fallopian tube (94.72%) being the most common site of ectopic pregnancy followed by ovary (1.58%) and cervix (0.53%). Right sided (53%) fallopian tube ectopic pregnancies were common than left sided tubal ectopics (47%). Most of fallopian tube ectopic pregnancies were ruptured (71%) with partial salphingectomy (61%) being treatment of choice. All the cases were confirmed histopathologically.

**Conclusion:** Ectopic pregnancies are one of the leading causes of maternal mortality as its uncommon sites pose a diagnostic challenge. There are no specific clinical signs to diagnose. Ultrasonography and histopathological examination plays a vital role in confirmation of clinical diagnosis of ectopic pregnancy in these sites.

**Keywords:** Ectopic pregnancy, fallopian tube, Ultrasonography

## Introduction

The implantation of conceptus outside the uterus or in an abnormal position within uterus was known as ectopic pregnancy. It forms the most common cause of pregnancy related maternal mortality in first trimester[1]. The incidence of ectopic pregnancy accounts for 2% of all pregnancies[2] and the most common site being fallopian tube (97%)[3] followed by least common sites like ovary, cervix, cornua, abdominal, previous

caesarean scar pregnancy or intramural pregnancy. There were many identifiable risk factors for development of these ectopic gestations at variable sites. Ultrasonography, both transvaginal (TVS) and transabdominal forms the main stay of diagnostic tool to identify these rare sites. Other investigations includes Serum beta HCG and some clinical signs like acute abdomen with bleeding per vagina were also helpful in diagnosis.

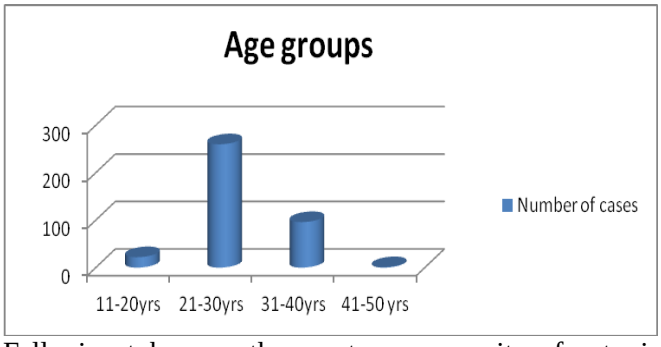
**Materials and Methods**

A retrospective study was conducted in the department of pathology, Institute of Obstetrics and Gynecology, Egmore, Chennai over a period of 5yrs from Feb 2015 to Feb 2019. Medical records of all women with ectopic pregnancies were retrieved and data was analysed.

**Results**

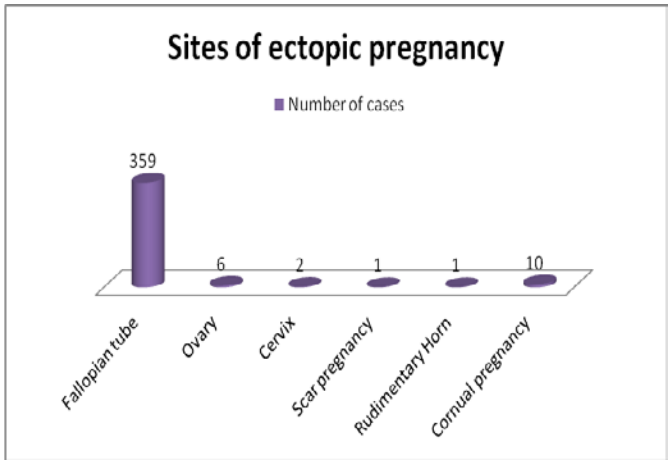
Over a period of 5yrs, 63720 deliveries were conducted; out of which 379 cases were ectopic pregnancies with incidence of 0.6%. The majority of ectopic pregnancies occurred in the age group of 21-30 yrs (68.60%) as shown in chart 1. The youngest age group reported in this study was 18yrs and the oldest age group reported was 42yrs.

**Chart 1: Age groups of study population**



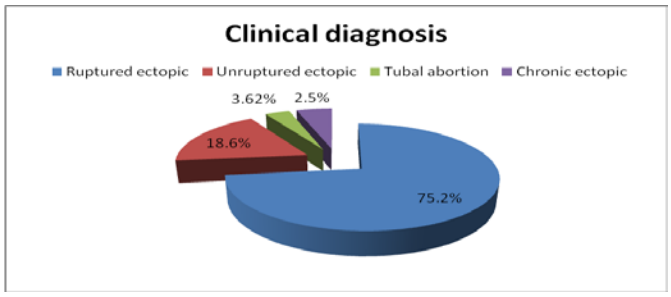

Fallopian tube was the most common site of ectopic pregnancy with incidence of 94.72% followed by 10cases (2.65%) in cornual region of uterus, 6cases (1.58%) in ovary, 2cases (0.53%) in cervix and one case each in previous cesarean scar and rudimentary horn pregnancy as shown in chart 2.

**Chart 2: Distribution of cases based on site of ectopic pregnancy**




Ruptured tubal ectopic pregnancies were seen in 75.20% of cases, unruptured in 18.66%, tubal abortion in 3.62% and chronic ectopic in 2.50% of cases as shown in Chart 3.

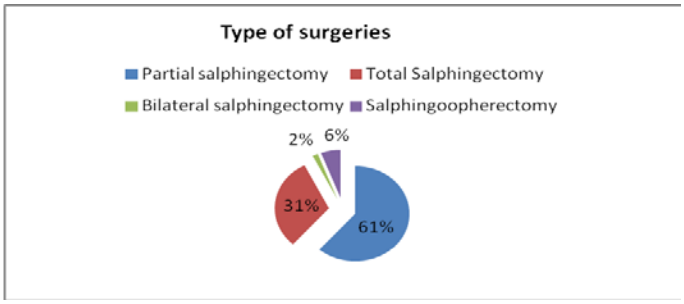
**Chart 3: Distribution of cases according to clinical diagnosis**




Almost all cases of tubal ectopic were unilateral, only one case of bilateral ectopic pregnancy was reported and confirmed histopathologically. The most common site in tubal pregnancy was ampullary region. Right sided (53%) fallopian tube was commonly involved than left sided tube (47%). All these cases were surgically managed with partial salphingectomy in 61% of cases, total salphingectomy in 31% of cases. In 3% of cases bilateral salphingectomy were done in patients who have completed their family and bilateral

salphingoopherectomy in 6% of cases presented as chronic ectopic or as tuboovarian mass (Chart 4).

**Chart 4: Distribution of cases according to type of surgeries**




All the samples were subjected to histopathological examination and clinical diagnosis of ectopic pregnancy was confirmed in 97% of cases. 3% of cases clinically reported as ectopic pregnancy but histologically confirmed as ruptured hemorrhagic corpus luteal cyst.

**Discussion**

Ectopic pregnancies constitute about 2% of all pregnancy. 97% of cases occur in fallopian tube followed by least common sites like ovary (< 3%), cervix (< 1%), interstitial pregnancy (2-4%), intramural pregnancy (<1%), abdominal pregnancy (0.9-1.4%) and heterotopic pregnancy(1-3%)[4,5]. Ultrasonography helps in clinically diagnosing these pregnancies at various sites. There are certain risk factors associated with development of ectopic pregnancy. The classical triad of presentation includes abdominal pain, amenorrhea and vaginal bleeding and the most common physical findings include abdominal tenderness and adnexal tenderness.

Fallopian tube is a hollow tubular organ measuring about 7-14cm long. It is divided into four parts fimbria, infundibulum, ampulla and isthmus. 95-97% of ectopic gestation occurs in fallopian tube, in which ampullary region forms the more common site with incidence of 70% followed by isthmus (12%), Fimbria (11.1%), infundibulum (2.4%)[4,5]. There are certain tubal and non tubal risk factors for the development of ectopic gestation in fallopian tube. The tubal factors include congenital abnormalities in the tube like diverticula, hypoplasia, accessory ostia; exposure to diethyl stilbosterone (DES) resulting in structural abnormality; chronic salphingitis increases two fold risk in development; granulomatous and non granulomatous salphingitis due to tuberculosis, Chlamydia, mycoplasma results in postinflammatory scarring and ciliary dysfunction; postligation pregnancy and tuboplasty[3]. Some of the extratubal factors like smoking resulting in ciliary damage causing increase in amount of time it take for the fertilized egg to reach the endometrial cavity. Fallopian tube ectopic pregnancy usually presents as medical emergency with symptoms of abdominal pain and vaginal bleeding. Grossly ruptured ectopic pregnancy presents as hemorrhagic mass while unruptured ectopic pregnancies are seen as irregular dilatations of tube with bluish discoloration caused by hematosalphinx[6, 7]. Microscopically there are intraluminal chorionic villi and extravillous trophoblast, variable fetal parts, decidual change in lamina propria seen in one third of cases, and mesothelial reaction with papillary proliferations.

Cervical pregnancy occurs when there is implantation of embryo in the cervical canal below the internal os within the cervical mucosa. It occurs in 0.1-1% of all ectopic pregnancy[8] or 1:16000 to 1:18000 of all pregnancies[9]. The main risk factors that lead to development of cervical pregnancy are previous cesarean section, use of prior intrauterine devices, invitro fertilization, asherman syndrome, previous abortion, repeated dilatation and curettage[10, 11]. The etiology of cervical pregnancy remains unknown but studdiford et al[12] suggested two theories. In one theory,

the implantation occurs due to rapid transport of fertilized ovum to the cervical canal before nidation and the other theory states that the implanation occurs due to damage to the cervical lining during operative procedures. Palmann and Meelin[13] suggested clinical criteria for diagnosing the cervical pregnancy which includes uterine bleeding without cramping pain following a period of amenorrhoea, hourglass shaped uterus, partially opened external os, closed internal os. Anatomical and histopathological criteria were described by Rubin in the year 1911[14] which includes cervical glands must be seen opposite the attachment of trophoblast or placenta, attachement of trophoblast must be below the level of entrance of uterine vessels to the uterus or anterior peritoneal refection, fetal elements (products of conception) must be absent from corpus uterus. The main drawback of these two criteria was that they were applied only on hysterectomy specimens since most of the cases were managed conservatively.

Cornual or interstitial pregnancy occurs when there is implantation of developed embryo in proximal portion of fallopian tube lying within the muscular wall of uterus. It represents 2-4% of all ectopic pregnancy and has an high mortality rate (2-3%)[15]. This high mortaliy rate is due to the fact that this kind of pregnancy was diagnosed at advanced at more than 12wks of pregnancy by the time it ends in rupture of uterus. Ovarian pregnancy occurs in 0.5-3% of all ectopic pregnancies[16] and the main risk factors are endometriosis, use of Intrauterine devices and assisted reproductive techniques. Spiegelberg criteria help in diagnosing ovarian pregnancy. There are 4 criteria which includes fallopian tube at the affected site must be intact, gestational sac must be located in the region of the ovary, ectopic pregnancy must be connected to the uterus by ovarian ligament, ovarian tissue must be located within the wall of the gestational sac and proved histologically[17].

Table 1 enumerates comparison of this study with other case series in the literature.

Table 1: Comparison of Case series of ectopic pregnancies with present study

| Authors/Year | No of cases reported | Incidence | Age range | Site of ectopic | Clinical diagnosis | Side of fallopian tube |
|---|---|---|---|---|---|---|
| Shradha et al[18] 2014 | 31 cases | 5.6/1000 deliveries | 25-30yrs 74.2% | Ampulla-45.2%<br>Cornua -19.4%<br>Isthmus – 2%<br>Fimbria – 22.6%<br>Ovary – 6.5%<br>Heterotopic -6.55% | Ruptured–61.3%<br>Unruptured–22.5%<br>Tubal abortion-12.9% | Right side |
| Sudha et al[19] 2016 | 228cases | 0.81% | 20-25yrs 42.98% | Ampulla-63.15%<br>Cornua -13.15%<br>Isthmus – 11.40% | Ruptured–66.66%<br>Tubal abortion- | Right side |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Fimbria – 7.01%<br>Ovary – 3.94%<br>Cervical – 0.43%<br>Scar pregnancy-0.43% | 20.17% | |
| Anuradha et al[20]<br>2016 | 73cases | 1.77% | 21-30yrs<br>79% | Ampulla-61.97%<br>Cornua -2.82%<br>Isthmus – 22.54%<br>Fimbria – 12.67%<br>Ovary – 2.74% | Ruptured–61.64%<br>Unruptured–13.7%<br>Tubal abortion-24.65% | Right side |
| Asuri et al[21]<br>2016 | 62 cases | 1 in 380 deliveries | 20-30yrs<br>72%` | Ampulla-70.96%<br>Cornua -2%<br>Isthmus – 23.8%<br>Cervix one case | Ruptured–82.3%<br>Unruptured–3%<br>Tubal abortion-6% | Right side |
| Shukla et al[22]<br>2017 | 102cases | 1 in 205 Deliveries | 20-30yrs<br>66.67% | Ampulla-62.74%<br>Cornua -2.94%<br>Isthmus – 26.48%<br>Fimbria – 2.94%<br>Ovary – 1.96%<br>Rudimentary horn – 2.94% | Ruptured–63.92%<br>Unruptured–32.99%<br>Tubal abortion-3.90% | Right side |
| Ansa Islam et al[23]<br>2017 | 45 cases | 0.65% | - | Ampulla-64.44%<br>Isthmus – 24.44%<br>Fimbria – 8.89%<br>Rudimentary horn – 2.22% | Ruptured–71.1%<br>Unruptured–28.9% | Right side |
| Zuber et al[24]<br>2018 | 42 cases | 1.63% | 21-30yrs<br>64.29% | Ampulla-45.23%<br>Cornua -7.14%<br>Isthmus – 9.52%<br>Fimbria – 7.14%<br>TO mass– 28.57% | Ruptured–26.19%<br>Unruptured-16.67%<br>Tubal abortion-19.05%<br>Chronic ectopic-33.33% | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| Arati et al[25] 2018 | 187 cases | 18/1000 Deliveries | 21-30yrs 54.8% | Ampulla-51.6% Cornua -6.65% Isthmus – 16.1% Ovary – 3.2% | Ruptured–83.9% Chronic ectopic-16.1% | Right side |
| Radhika et al[2] 2018 | 80cases | 3% | 25-29% 43.75% | Ampulla-42.5% Interstitial- 2.5% Isthmus – 15% Fimbria – 3.75% Ovary – 1.25% | Ruptured–55% Chronic ectopic-18.75% | Left side |
| Present study 2019 | 379cases | 0.6% | 21-30yrs 68.60% | Fallopian tube – 94.72% Cornua-2.65% Ovary – 1.58% Rudimentary horn – 0.26% Cervix – 0.53% Scar pregnancy – 0.26% | Ruptured– 75.20% Unruptured-18.66% Tubal abortion-3.62% Chronic ectopic-2.52% | Right side |

**Conclusion**

Ectopic pregnancies are one of the leading causes of maternal mortality as its uncommon sites pose a diagnostic challenge. There are no specific clinical signs to diagnose. Ultrasonography and histopathological examination plays a vital role in confirmation of clinical diagnosis of ectopic pregnancy in these sites.

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