

## ORIGINAL RESEARCH

# Ectopic Pregnancy in Tertiary Care: Unveiling Clinical Profiles and Analyzing Outcomes

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**ABSTRACT**

**Background:** To investigate the clinical characteristics, treatment approaches, and results in patients diagnosed with ectopic pregnancy (EP) upon hospital presentation.

**Methods:** A prospective observational study was conducted on 150 women diagnosed with ectopic pregnancy, drawn from a pool of 2700 women attending the Gynecology department over a two-year period. Patient-specific information, including age, socioeconomic status, referral sources, symptoms, obstetric history, and clinical indicators, was meticulously documented. Ultrasound examinations were performed to identify the precise location of the ectopic pregnancies. Adherence to hospital protocols guided the management of patients, with subsequent recording of outcomes for comprehensive analysis.

**Results:** The frequency of EP in the present study was 6.55%. The majority of the cases (60%) were between 20-30 years of age, from the lower middle class (57%), referral cases (63%), and multigravida (i.e. >G4) (31%) cases. Amenorrhea was the most common symptom seen in 146 (97.33%) cases.

**Conclusion:** We present an observed frequency of 6.55% for ectopic pregnancies (EP). The affected individuals, falling within the 20-40 age range, were predominantly from the lower socioeconomic class. Amenorrhea emerged as the most prevalent symptom. Notably, the ampullary region stood out as the most frequent site for ectopic pregnancies. Ruptured ectopic cases were identified as a significant and concerning complication. Timely diagnosis of the site, coupled with surgical intervention, emerged as crucial elements for effectively managing cases with rupture, emphasizing the importance of early intervention in optimizing outcomes.

**Keywords:** Ultrasound, rupture, ectopic.

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**INTRODUCTION**

Ectopic pregnancy (EP) is a complication that occurs in the first trimester of pregnancy when an embryo implants outside of the uterus. In India, the incidence has been reported in the range of 0.91-2.3%. The most frequent risk factors of EP include a history of abortions and pelvic inflammatory disease (PID).<sup>1</sup> Because the classic symptoms triad of amenorrhea, abdominal pain, and vaginal bleeding is present only in 30% to 40% of patients with EP, the diagnosis requires a high index of clinical suspicion. Atypical symptoms often complicate the identification of EP, with the classic triad not being universally present. This underscores the importance of a high index of clinical suspicion, particularly in women with risk factors. Diagnostic tools, such as ultrasound and beta-human chorionic gonadotropin (beta-hCG) blood tests, play a crucial role in confirming ectopic pregnancies.<sup>2</sup> Timely and accurate diagnosis is essential for effective management and the prevention

of complications associated with EP. Ectopic pregnancy, characterized by the implantation of the embryo outside the uterus, poses a significant threat to maternal health, particularly in the first trimester.<sup>3,4</sup> It constitutes a noteworthy cause of maternal mortality and morbidity, contributing to approximately 10% to 15% of all maternal deaths. The impact of ectopic pregnancy on maternal health is particularly pronounced in developing countries, where it is emerging as a significant cause of morbidity and mortality. Patients with ectopic pregnancies often present late, and complications such as rupture and shock are common. The delayed presentation can be attributed to the challenge of recognizing symptoms, as the classic triad of amenorrhea, abdominal pain, and vaginal bleeding is only present in 30% to 40% of cases. This delayed presentation contributes to adverse outcomes, including fetal loss, recurrence of ectopic pregnancies, and potential impairment of subsequent fertility. Determining the true incidence of

ectopic pregnancy is complicated. It varies widely among different institutions and countries, influenced by factors such as the criteria used for calculations and the diagnostic capabilities of healthcare facilities. Despite this variability, the overall incidence of ectopic pregnancy is increasing globally. However, the case-fatality rate has seen a decrease, indicating that, while more cases are being diagnosed, the outcomes have improved. Several factors contribute to these trends. The rise in pelvic inflammatory disease (PID) plays a role, with better antibiotics allowing for tubal patency despite luminal damage following infection. Additionally, the increased use of ovulation induction, assisted reproductive technology, and improved diagnostic techniques contribute to the identification of more cases.<sup>5,6</sup> It's crucial to note that the fallopian tube is the site of occurrence in more than 95% of ectopic pregnancies, underscoring the importance of understanding this specific aspect for diagnosis and management. The awareness of risk factors, early detection through appropriate diagnostic methods such as ultrasound and beta-human chorionic gonadotropin (beta-hCG) blood tests, and prompt, effective management are essential to mitigate the risks associated with ectopic pregnancies and improve overall outcomes for affected individuals.<sup>7</sup> The etiology of ectopic pregnancy remains a complex area of study, and while it is not entirely clear, numerous factors have been identified that increase the risk of this condition. A common thread among these risk factors is their interference with the normal functioning of the fallopian tubes, where fertilization typically occurs, and the embryo subsequently travels to the implantation site in the uterus. The disruptions caused by these factors increase the likelihood of ectopic pregnancy, and they can broadly be categorized as either anatomic or functional. Anatomic factors involve physical impediments that obstruct the movement of the egg through the fallopian tube. For instance, scarring resulting from pelvic inflammatory disease (PID), puerperal sepsis, postabortion sepsis, appendicitis, or the use of intrauterine contraceptive devices can block the normal transport of the egg. Functional factors, on the other hand, are related to issues such as impaired tubal mobility, which can also contribute to an increased risk of ectopic pregnancy.<sup>8</sup> These disruptions in the normal physiological processes of the fallopian tubes create an environment conducive to the implantation of the embryo in locations outside the uterus. Pelvic inflammatory disease, puerperal sepsis, postabortion sepsis, appendicitis, and the use of intrauterine contraceptive devices are recognized as sources of pelvic infection and have been identified as major risk factors for ectopic pregnancy. Additionally, other etiological risk factors include a history of tubal or pelvic surgeries, endometriosis, exposure to diethylstilbestrol in utero, the presence of chromosomally abnormal embryos, the use of progestin-only pills, cigarette smoking, conception

following induction of ovulation and in vitro fertilization (IVF) and embryo transfer (assisted reproductive technology), a history of previous abortion, previous ectopic pregnancy, a history of infertility, race, and age above 35 years.<sup>9</sup> Importantly, ectopic pregnancy can also occur without any obvious risk factors, underlining the multifactorial nature of this condition. In the case of a ruptured ectopic pregnancy, the presentation can vary from an acute emergency to a subacute scenario. What adds complexity to the clinical picture is that individuals may be asymptomatic before rupture occurs. This highlights the critical importance of recognizing both symptomatic and asymptomatic cases to enable early diagnosis and intervention, ultimately improving outcomes for individuals at risk of ectopic pregnancies.

## MATERIALS AND METHODS

In the course of a comprehensive two-year prospective observational study conducted at the Obstetrics and Gynaecology department, a cohort of 150 women diagnosed with ectopic pregnancy was investigated among a larger population of 2700 women. This study specifically targeted adult females presenting with ectopic pregnancies, excluding individuals with malignancies or those currently experiencing intrauterine pregnancies unrelated to ectopic conditions. The identification of ectopic pregnancies was a multi-faceted process, encompassing clinical, imaging, and laboratory criteria. Clinically, suspicion was raised based on a constellation of symptoms, including missed periods, nausea, vomiting, vaginal bleeding, breast tenderness, frequent urination, or pelvic pain. The diagnostic approach incorporated ultrasound imaging, where the absence of signs of a typical intrauterine pregnancy, the presence of an adnexal mass, or the lack of an intrauterine gestational sac (as confirmed through transvaginal ultrasound) contributed to the suspicion of ectopic pregnancy. Furthermore, laboratory investigations played a crucial role, with the assessment of  $\beta$ -hCG levels. Ectopic pregnancy was suspected if  $\beta$ -hCG levels were found to be above 1,500 mIU per mL. Conversely, lower serum  $\beta$ -hCG levels (<1,500 mIU per mL) also contributed to the diagnostic criteria. To maintain the rigor of the study, exclusion criteria were established to eliminate patients with any form of malignancy or those currently undergoing intrauterine pregnancies unrelated to ectopic conditions. The determination of the sample size for this study was informed by a prior investigation led by Verma et al., where the fallopian tube emerged as the most common site of ectopic pregnancy in 85.7% of patients. Utilizing these findings as a reference, the sample size for the current study was calculated with specific parameters, including an alpha error of 0.05, a study power of 80%, and a margin of error ranging from 10-15%. This meticulous calculation resulted in a determined

sample size of 150 participants, ensuring statistical robustness and relevance in the exploration of ectopic pregnancies within the defined population.

**RESULTS**

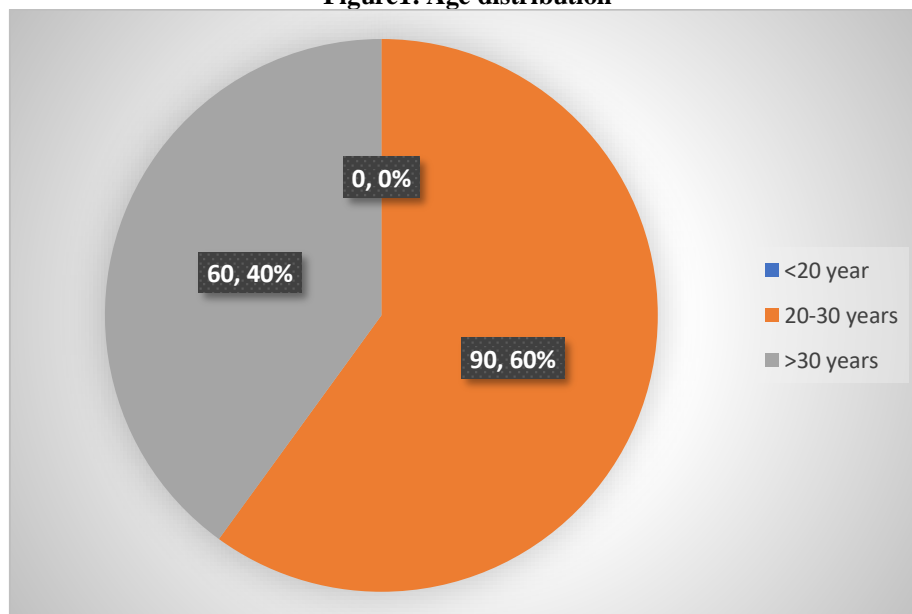
During the study period, a total of 2700 women visited the Outpatient Department (OPD), and among them, 150 cases were diagnosed with ectopic pregnancies (EP), resulting in a frequency of 6.5%. The mean age of the patients was 58 years with a standard deviation of 3.8 years. Socioeconomic distribution revealed that the majority of the patients, comprising 86 individuals (57%), belonged to the lower middle class, followed by 44 (29%) from the upper middle class. A smaller percentage of cases, 5 (7%) each, were from the poor and high socioeconomic sections. In terms of patient referral, 54 cases (63%) were referred, while 56 cases (37%) sought medical attention directly. Among the cases of ectopic pregnancies, 58 (37.3%) presented with the

classical triad of symptoms, which includes amenorrhea, abdominal pain, and vaginal bleeding. The predominant symptom observed was amenorrhea, noted in 146 cases (97.33%), followed by lower abdominal pain in 142 cases (94.67%). Bleeding per vagina (PV) was reported in 30 cases (40%), and syncope was observed in six cases (8.00%). Regarding gravidity, a significant portion of the patients were multigravida (i.e., greater than G4) comprising 42 cases (31%), followed by Gravida-3 with 36 cases (27%). Gravida-2 and primigravida had a similar frequency, each accounting for 28 cases (21%). These findings provide a comprehensive snapshot of the demographic and clinical characteristics of women diagnosed with ectopic pregnancies during the study period, offering valuable insights into the prevalence, age distribution, socioeconomic status, referral patterns, and clinical presentation of this condition in the examined population.

**Table1: Age distribution**

Age	Number	Percentage
<20 year	0	0%
20-30 years	90	60%
>30 years	60	40%

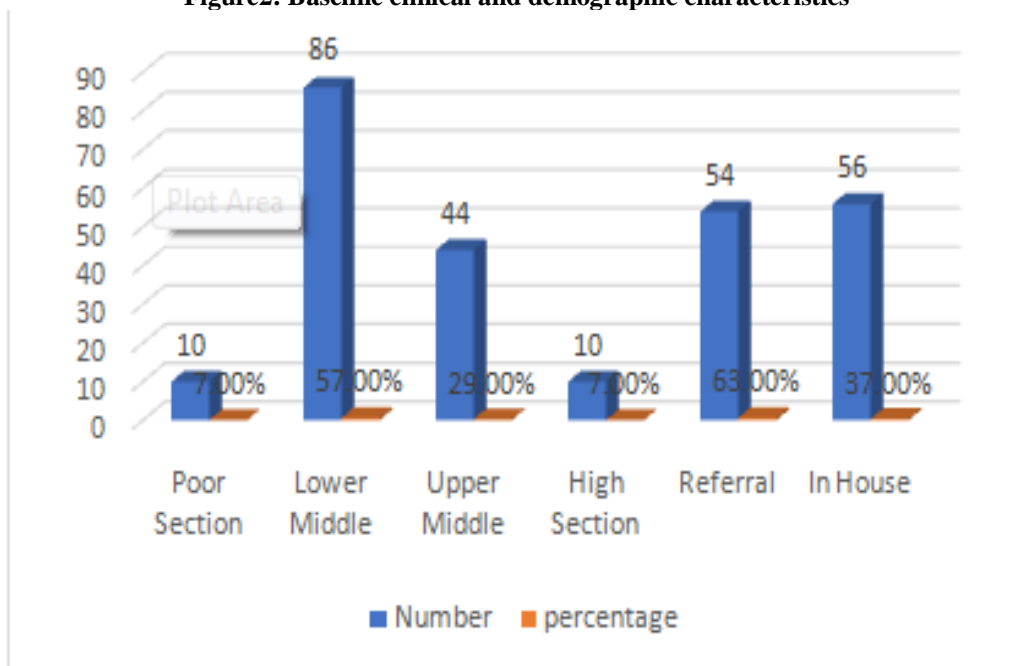
**Figure1: Age distribution**



**Table2: Baseline clinical and demographic characteristics**

Socioeconomic Status	Number	Percentage
Poor Section	10	7.00%
Lower Middle	86	57.00%
Upper Middle	44	29.00%
High Section	10	7.00%
Referral	54	63.00%
In House	56	37.00%

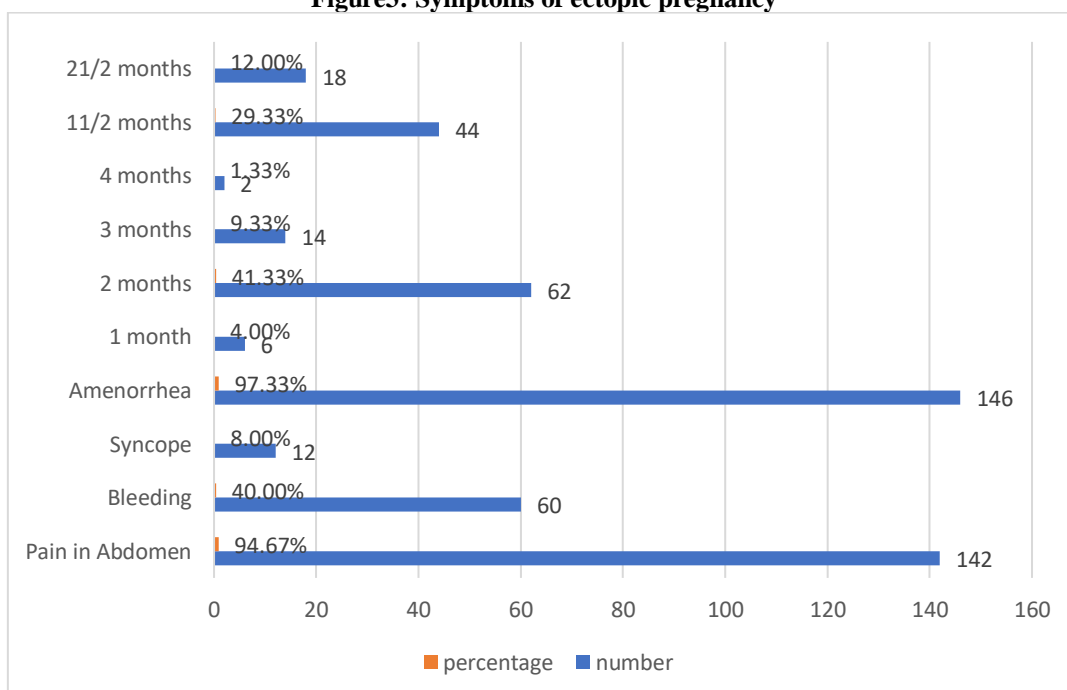
**Figure2: Baseline clinical and demographic characteristics**



**Table3: Symptoms of ectopic pregnancy**

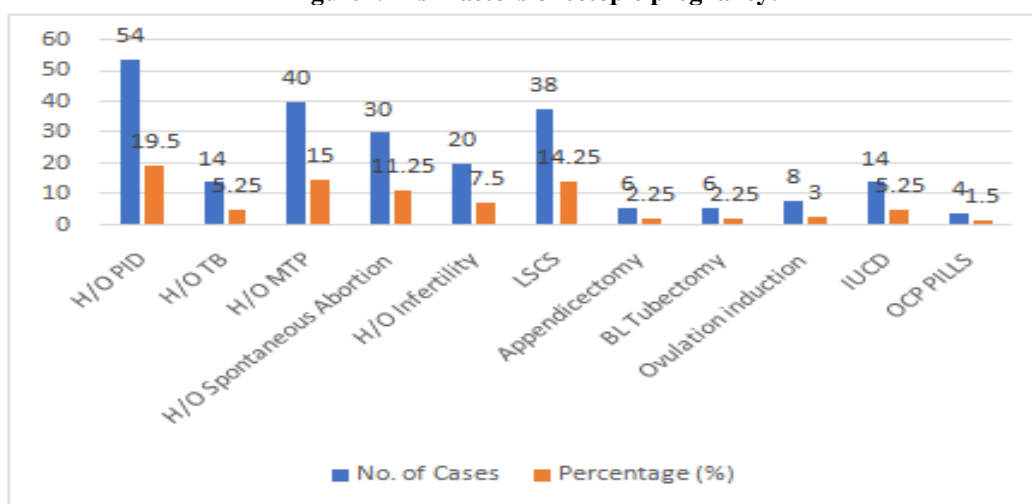
Symptoms Of Ectopic Pregnancy	Number	Percentage
Pain in Abdomen	142	94.67%
Bleeding	60	40.00%
Syncope	12	8.00%
Amenorrhea	146	97.33%
1 month	6	4.00%
2 months	62	41.33%
3 months	14	9.33%
4 months	2	1.33%
11/2 months	44	29.33%
21/2 months	18	12.00%

**Figure3: Symptoms of ectopic pregnancy**



**Table4: Risk factors of ectopic pregnancy:**

Risk Factor of Ectopic Pregnancy	No. of Cases	Percentage (%)
H/O PID	54	19.5
H/O TB	14	5.25
H/O MTP	40	15
H/O Spontaneous Abortion	30	11.25
H/O Infertility	20	7.5
LSCS	38	14.25
Appendectomy	6	2.25
BL Tubectomy	6	2.25
Ovulation induction	8	3
IUCD	14	5.25
OCP PILLS	4	1.5

**Figure4: Risk factors of ectopic pregnancy:**

## DISCUSSION

The escalating rates of sexually transmitted diseases (STDs), induced abortions, evolving lifestyles, delayed childbearing, increased reliance on assisted reproductive technologies, and improvements in diagnostic methods collectively contribute to a worldwide surge in the incidence of ectopic pregnancies (EP).<sup>10,11</sup> Within the scope of the current study, a noteworthy frequency of 150 cases with ectopic pregnancy was documented, representing 5.5% of the study population. To contextualize this finding, comparisons were drawn with previous Indian studies that reported varying frequencies of EP. Prasanna et al. revealed a frequency of 1.8%, while Nethra et al. reported a slightly lower incidence at 1.38%. Verma et al. observed a frequency of 2.3%. Notably, Kalyankar et al. reported a comparatively higher incidence of EP, reaching 3.95 per 1,000 pregnancies. The higher frequency of ectopic pregnancies in the present study may be attributed to several contributing factors. Increased referrals suggest that the study cohort might have included patients with more intricate or severe cases, potentially contributing to the elevated frequency. Additionally, the lower socioeconomic status of the population under examination could play a role. Lower socioeconomic status is often associated with

various risk factors, including limited access to healthcare, delayed diagnosis, and potentially higher rates of pelvic inflammatory disease—a known risk factor for ectopic pregnancies. These findings underscore the intricate and multifaceted nature of ectopic pregnancies, influenced by a myriad of societal, healthcare, and individual factors. The observed variations in reported frequencies across studies emphasize the importance of considering regional and demographic disparities when interpreting and comparing findings in the realm of reproductive health. As societies undergo changes in lifestyle, reproductive practices, and healthcare accessibility, understanding these nuanced factors becomes crucial for effective public health strategies and clinical management.<sup>12</sup> Ectopic pregnancies exhibit a broad age distribution, as evidenced by the diverse demographic characteristics observed in the present study. The majority of patients (60%) fell within the 20-30 years age group, emphasizing the vulnerability of this reproductive age bracket to ectopic pregnancies. A significant portion of these individuals belonged to the lower middle class (57%) and were referred cases (63%). Notably, a substantial number of cases were multigravida (79%), indicative of women who had experienced multiple pregnancies. The classical triad of ectopic pregnancy,

comprising amenorrhea, vaginal bleeding, and pelvic pain, was identified in 28 cases (37.3%). However, consistent with existing literature, the most prevalent symptom was amenorrhea, affecting 97.33% of the patients, followed closely by pain in the lower abdomen (94.67%) and bleeding per vagina (40%). Comparison with findings from Verma et al. reveals similarities, as the majority of women in both studies were within the 21-30 years age range. Similarly, Verma et al. reported a prevalence of primipara (62.1%), and the classical triad of ectopic pregnancy was observed in 39% of patients, aligning with the present study.<sup>13</sup> Kalyankar et al.'s observations also align with the current findings, as their study highlighted the classical triad in 45.38% of cases, with abdominal pain being the most common symptom (90.76%), followed by amenorrhea (79.23%) and bleeding per vagina (63.07%). Nethra et al.'s study further reinforces the consistency in demographic and symptomatic patterns across various studies. Similar age demographics were observed (63% in the 21-30 years age group), along with a predominance of multigravida (76%) and individuals with lower socioeconomic status (74%). Amenorrhea, abdominal pain, bleeding per vagina, and syncopal episodes were prevalent symptoms in their study, mirroring the symptomatology identified in the present investigation. These collective findings highlight the importance of understanding the demographic and clinical nuances of ectopic pregnancies, providing valuable insights for both clinicians and researchers. The recurrent patterns across studies underscore the need for heightened awareness and early detection strategies, particularly in specific age groups and populations with identified risk factors.<sup>14</sup> Pelvic inflammatory disease (PID) and recurrent abortions represent significant contributors to the occurrence of ectopic pregnancies (EP). The pathophysiological link lies in the formation of scar tissue within the fallopian tubes, which may result from trauma, untreated long-standing PID, or post-abortive complications. The intricate mechanisms involve both endosalpingitis and exosalpingitis, each playing a role in creating an environment conducive to ectopic implantation. Endosalpingitis, characterized by inflammation of the inner lining of the fallopian tubes, can lead to damage of the mucosa and the entrapment of a migrating embryo. This sets the stage for ectopic implantation, where the compromised tubal environment hinders the normal passage of the embryo. Exosalpingitis, on the other hand, induces the formation of peritubal adhesions. These adhesions impede the peristaltic motion of the fallopian tubes, resulting in insufficient transport of the embryo. The cascade of events initiated by exosalpingitis contributes to the increased risk of ectopic pregnancies. The association between repeated abortions and ectopic pregnancies is elucidated by post-abortive infections that cause tubal damage.<sup>15</sup> These infections, often a consequence of illegal

abortions performed without aseptic procedures and inadequate antibiotic treatment, can lead to scarring and compromise the integrity of the fallopian tubes. As a result, the risk of ectopic pregnancies escalates due to the impaired functionality of the fallopian tubes. Previous ectopic pregnancies serve as indicators of underlying tubal disease. Frequently bilateral, these underlying conditions increase the likelihood of subsequent ectopic pregnancies. Poor surgical techniques and the development of peritubal fistulas can contribute to the recurrence of ectopic pregnancies. In the postpartum period, the fallopian tubes may undergo changes such as edema, congestion, and friability, enhancing the risk of incomplete tubal occlusion. This incomplete occlusion increases the chances of ectopic pregnancies, particularly when the tubal environment is compromised. Understanding these intricate mechanisms is crucial for clinicians in identifying risk factors, implementing preventive measures, and offering appropriate interventions to reduce the occurrence of ectopic pregnancies associated with PID and repeated abortions. Additionally, it underscores the importance of safe and aseptic practices in reproductive healthcare to mitigate the risk of post-abortive infections leading to tubal damage and subsequent ectopic pregnancies.

## CONCLUSION

In summary, the study revealed an ectopic pregnancy (EP) frequency of 6.5%. The demographic profile of those most affected included women in the maximum reproductive age group (20-30 years), multigravida individuals, and those from a lower socioeconomic class. The predominant symptoms were amenorrhea and lower abdominal pain. The most commonly affected sites for EP were the ampullary and fimbrial regions of the fallopian tubes. Risk factors, particularly a history of pelvic inflammatory disease (PID) and medical termination of pregnancy (MTP), were frequently associated with ectopic pregnancies. Complications included rupture ectopic pregnancies and hemoperitoneum, necessitating blood transfusion, with a singular case resulting in mortality. The study's findings underscore the importance of early identification and prompt treatment of ectopic pregnancies, particularly in early pregnancy units utilizing point-of-care ultrasound. The results suggest that timely intervention can significantly reduce morbidity and mortality associated with ectopic pregnancies. Furthermore, the study highlights the necessity of a thorough evaluation of pregnancies, especially in individuals with identified risk factors, to effectively rule out ectopic cases. This emphasizes the critical role of vigilant antenatal care and early diagnostic measures in ensuring favorable outcomes for pregnancies, particularly in populations at a higher risk of ectopic pregnancies.

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