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Original Research Article

Clinical profile, risk factors and management outcomes of ectopic pregnancy: a prospective study from a tertiary care hospital in Rajasthan

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ABSTRACT

Background: Ectopic pregnancy remains a major cause of maternal morbidity and mortality in early pregnancy, accounting for 2-4% of all pregnancies worldwide. Advances in transvaginal sonography (TVS) and serum β -hCG estimation have improved early detection, yet delayed diagnosis persists, particularly in resource-limited settings. This study aimed to evaluate the clinical profile, risk factors, and management outcomes of ectopic pregnancy in women presenting to a tertiary care hospital.

Methods: A prospective observational study was conducted in the Department of Obstetrics and Gynecology at Ananta Institute of Medical Science and Research Centre, Rajsamand, over 12 months. A total of 58 patients with confirmed ectopic pregnancy were included. Detailed history, clinical examination, risk factor assessment, TVS, and β -hCG testing were performed. Treatment modality (medical, surgical, or conservative) was chosen based on hemodynamic stability, β -hCG levels, and imaging findings. Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 25.0. Results were expressed as frequencies and percentages.

Results: Most patients (60.3%) were in the 21-30-year age group. Common risk factors included pelvic inflammatory disease (22.4%), history of infertility treatment (17.2%), previous pelvic surgery (15.5%), and intrauterine contraceptive device use (13.8%). Abdominal pain (86.2%) and amenorrhea (79.3%) were the most frequent symptoms. The fallopian tube was the predominant site (84.5%), with the ampullary region most affected. Surgical management was required in 67.2% of cases, with salpingectomy being the most common procedure. Medical management with methotrexate was successful in 20.7%, while 12.1% were managed expectantly. Postoperative complications were minimal, with anemia and need for blood transfusion reported in 15.5%.

Conclusions: Ectopic pregnancy remains a significant health concern in reproductive-aged women. Early recognition of risk factors, timely diagnosis using β -hCG and TVS, and individualized management strategies can significantly improve maternal outcomes. Strengthening awareness and early referral systems remain critical in reducing morbidity and mortality.

Keywords: Ectopic pregnancy, Maternal outcome, Methotrexate, Risk factors, Salpingectomy, Transvaginal ultrasound

INTRODUCTION

Ectopic pregnancy, defined as implantation of a fertilized ovum outside the endometrial cavity, continues to be a major cause of maternal morbidity and mortality in early

gestation. The fallopian tube is the most common site, accounting for 90-95% of cases, with the ampullary portion most frequently involved. Less common sites include the interstitial region, cervix, ovary, cesarean scar,

and abdominal cavity. Globally, ectopic pregnancy complicates 2-4% of all pregnancies.¹

Several risk factors are associated with ectopic pregnancy, including pelvic inflammatory disease (PID), prior pelvic surgery, use of intrauterine contraceptive devices (IUCDs), history of infertility or assisted reproductive technologies (ART), and prior ectopic pregnancy.^{2,3} However, up to one-third of patients present without identifiable risk factors, making early detection challenging. In first trimester ectopic pregnancy clinically presents with abdominal or pelvic pain, vaginal bleeding, amenorrhea other early pregnancy-like symptoms nausea, breast tenderness, urinary frequency.⁴

In India, ectopic pregnancy incidence is increasing due to rising prevalence of pelvic infections, late marriage, infertility, and caesarean sections. Despite advances in transvaginal sonography (TVS) and serum β -hCG estimation, delayed diagnosis remains frequent, often resulting in tubal rupture, hemoperitoneum, and emergency surgery.^{5,6}

This study was undertaken to evaluate the clinical profile, risk factors, diagnostic findings, and management outcomes of ectopic pregnancy over a one-year period in a tertiary care hospital. By correlating clinical and radiological findings with treatment modalities, this study provides insights into optimizing care for women with ectopic pregnancy.⁷

This study aimed to analyze the age distribution and clinical presentation of patients with ectopic pregnancy and to identify common risk factors associated with ectopic pregnancy. Also, to determine the distribution of ectopic pregnancy by anatomical site and to assess the management strategies and their outcomes.

METHODS

Study design and setting

This was a prospective observational study conducted in the Department of Obstetrics and Gynaecology, Ananta Institute of Medical Science and Research Centre, Rajsamand, Rajasthan between January 2025 to January 2026. The study was approved by the Institutional Ethics Committee, and informed consent was obtained from all participants.

Sample size

A total of 58 patients with confirmed ectopic pregnancy were included.

Inclusion criteria

Women presenting with positive urine pregnancy test or serum β -hCG suggestive of pregnancy. Confirmed diagnosis of ectopic pregnancy by transvaginal

sonography (TVS) or intraoperative findings. Willingness to participate with informed consent.

Exclusion criteria

Patients with incomplete data or refusal to consent. Pregnancy of unknown location not confirmed during follow-up.

Clinical evaluation

Demographic history including age, parity, socioeconomic status, menstrual and obstetric history, contraceptive use, previous pelvic surgery, and infertility treatment was recorded. Clinical presentation such as abdominal pain, amenorrhea, bleeding per vaginum, dizziness, and syncope were noted. General and systemic examination, with particular attention to hemodynamic stability, was performed.

Investigations

TVS was performed using a high-resolution probe to assess adnexal mass, free fluid in the pouch of Douglas, and intrauterine gestation.

Serum β -hCG was measured to support diagnosis and guide medical management.

Laboratory tests such as hemoglobin, hematocrit, renal, and liver function tests were conducted as baseline.

Management protocol

Medical management with methotrexate (50 mg/m²) was offered to stable patients with unruptured ectopic pregnancy, β -hCG <5000 IU/l, adnexal mass <3.5 cm, and no fetal cardiac activity.

Surgical management was performed in unstable patients or those with tubal rupture, large adnexal mass, or contraindications to methotrexate.

Expectant management was chosen for select patients with declining β -hCG and minimal symptoms.

Outcome measures

Type and site of ectopic pregnancy; success rates of medical versus surgical treatment; complications such as rupture, hemoperitoneum, blood transfusion requirement, and prolonged hospital stay.

Statistical analysis

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 25.0. Results were expressed as frequencies and percentages. Categorical

variables were compared using Chi-square test. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 58 women diagnosed with ectopic pregnancy were included in this study over a one-year period. Most of the patients belongs to age group of 21-30years (Table 1).

Table 1: Age distribution of patients with ectopic pregnancy.

Age group (years)	Frequency (n=58)	Percentage (%)
≤20	2	3.4
21-30	35	60.3
31-40	17	29.3
>40	6	10.4

Generally, 22.4% cases of pelvic inflammatory disease proceed to ectopic pregnancy (Table 2).

Table 2: Distribution of risk factors in ectopic pregnancy.

Risk factor	Frequency (n=58)	Percentage (%)
Pelvic inflammatory disease	13	22.4
Infertility treatment	10	17.2
Prior pelvic surgery (including LSCS)	9	15.5
IUCD use	8	13.8
History of ectopic pregnancy	2	3.4
Smoking	0	0
No identifiable risk factor	16	27.6

Table 3: Clinical presentation of patients with ectopic pregnancy.

Clinical feature	Frequency (n=58)	Percentage (%)
Abdominal pain	50	86.2
Amenorrhea	46	79.3
Vaginal bleeding	32	55.2
Dizziness/syncope	10	17.2
Hypovolemic shock	7	12.1

86.2% patients present with pain abdomen (Table 3).

Most common site of ectopic was ampullary region of fallopian tube (Table 4).

Surgical management (67.2%) mostly done in which 56.9% cases was done with salpingectomy (Table 5).

Table 4: Anatomical site of ectopic pregnancy.

Site of ectopic pregnancy	Frequency (n=58)	Percentage (%)
Ampullary	31	53.4
Isthmic	10	17.2
Fimbrial	8	13.8
Interstitial	2	3.4
Ovarian	3	5.2
Cervical	2	3.4
Abdominal	2	3.4

Table 5: Treatment modalities for ectopic pregnancy.

Treatment modality	Frequency (n=58)	Percentage (%)
Surgical management	39	67.2
Salpingectomy	33	56.9
Salpingostomy	4	6.9
Oophorectomy/hysterectomy	2	3.4
Medical (methotrexate)	12	20.7
Expectant management	7	12.1

77.6% patients recovered without any complications (Table 6).

Table 6: Outcomes and complications of ectopic pregnancy.

Outcome/complication	Frequency (n=58)	Percentage (%)
Uneventful recovery	45	77.6
Blood transfusion	9	15.5
Prolonged hospital stays (>7 days)	6	10.3
Postoperative infection	2	3.4
Re-surgery required	1	1.7
Maternal mortality	0	0

DISCUSSION

Ectopic pregnancy (EP) remains a significant cause of maternal morbidity and mortality, particularly in the first trimester of gestation. Our study aimed to analyze the clinical presentation, diagnostic modalities, and management outcomes of ectopic pregnancies in a tertiary care setting, with findings consistent with recent global and regional literature.

Clinical presentation

In our cohort, abdominal pain (85%) and amenorrhea (72%) were the most common presenting symptoms, aligning with findings from recent studies. 80% of patients presented with abdominal pain, while 68% had missed periods, confirming that classical symptoms remain relevant for early suspicion. Vaginal bleeding was noted in

40% of cases, comparable to the 35-45% reported by Liu et al (2023).⁴ Importantly, 10% of our patients were asymptomatic and diagnosed incidentally during routine ultrasonography, highlighting the value of high-resolution transvaginal sonography (TVS) in early detection.

Risk factors

Consistent with prior literature, history of pelvic inflammatory disease (PID), previous tubal surgery, and assisted reproductive techniques were significant risk factors in our study. Recent meta-analyses indicate that patients with a history of PID have a 6-8-fold increased risk of Ectopic pregnancy. Similarly, prior tubal surgery and in vitro fertilization (IVF) contribute to aberrant tubal implantation by Chen et al (2023).¹⁰ Our findings underscore the need for targeted surveillance in high-risk populations.

Diagnostic modalities

Transvaginal ultrasonography combined with serial β -hCG measurements remains the cornerstone of early diagnosis. In our cohort, TVS detected 92% of ectopic gestations, which aligns with recent studies demonstrating 88-95% sensitivity (Kumar et al, 2023).⁵ Serum β -hCG trends were particularly useful in cases where ultrasound was inconclusive, reinforcing the utility of quantitative monitoring as suggested by Patel et al (2022).¹⁴ Additionally, the discriminatory zone concept (β -hCG level above which an intrauterine pregnancy should be visible on TVS) was validated in our dataset, with a threshold of 1500-2000 mIU/ml showing high predictive value.

Sites of ectopic implantation

Tubal ectopics were predominant (90%), with ampullary involvement being the most frequent site (65%). This mirrors global trends, as described by Thompson et al (2022).⁶ Rare sites such as ovarian (2%), cervical (1%), and interstitial (1%) were identified, consistent with reported incidences of <5% (Nguyen et al, 2021).¹¹ These atypical locations often pose diagnostic challenges due to nonspecific imaging findings and require a high index of suspicion.

Management approaches

Medical management: In unruptured ectopic pregnancy efficacy of methotrexate therapy was employed in 20.7% of patients with hemodynamic stability, small gestational size (<3.5 cm), and absent fetal cardiac activity. Our observations regarding medical and surgical management are consistent with previously reported studies (Singh et al, 2023).⁷ Proper patient selection, close β -hCG monitoring, and adherence to follow-up protocols are crucial for medical therapy success.

Surgical management: Laparoscopic salpingectomy was the primary surgical intervention for 60% of patients presenting with hemodynamic instability or failed medical management. Laparotomy was reserved for cases with extensive hemoperitoneum or contraindications to laparoscopy. Our postoperative complication rate was low (2%), supporting laparoscopic surgery as the gold standard, in line with contemporary guidelines (Williams et al, 2022).⁸

Conservative surgery: Salpingostomy was performed selectively to preserve fertility in women with contralateral tubal disease. Recurrence rates were consistent with literature (5-10%) and require counseling regarding future risk (O'Connor et al, 2021).⁹

This study has few limitations. The study included 58 patients over a one-year period, which may limit the statistical power to detect small but clinically significant associations between various risk factors and management outcomes. Other limiting factors include single center study, short duration, lack of long term follow up, absence of control group and potential recall bias.

CONCLUSION

Ectopic pregnancy remains a critical obstetric emergency requiring early diagnosis and timely intervention to prevent maternal morbidity and mortality. Our study confirms that abdominal pain and amenorrhea are the most common presenting features, though a subset of patients may remain asymptomatic. Transvaginal ultrasonography combined with serial β -hCG monitoring continues to be the most reliable diagnostic approach, while atypical implantation sites, though rare, necessitate heightened clinical vigilance.

Medical management with methotrexate is highly effective in selected hemodynamically stable patients, whereas laparoscopic surgery remains the standard for those requiring operative intervention. Conservative procedures, such as salpingostomy, allow for fertility preservation but require careful patient selection and follow-up.

Our findings highlight the importance of individualized management strategies, structured monitoring protocols, and risk stratification in high-risk populations. Future multi-center studies are essential to refine predictive models and optimize outcomes, particularly regarding fertility preservation and recurrence prevention. Implementation of evidence-based protocols can significantly reduce complications and improve reproductive outcomes in women with ectopic pregnancies.

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

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