

INCIDENCE, CLINICAL PRESENTATION, AND RISK FACTORS OF ECTOPIC PREGNANCY: A CROSS-SECTIONAL STUDY IN SIALKOT DISTRICT, PAKISTAN"

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Abstract: Ectopic pregnancy is a significant cause of maternal morbidity and mortality, particularly in low-resource settings like Pakistan. Understanding its incidence, symptoms, and risk factors is essential to improve diagnosis and management. **Objective:** To evaluate the incidence, clinical presentations, and risk factors associated with ectopic pregnancies across six hospitals in Sialkot district, Pakistan. **Methods:** A descriptive cross-sectional study was conducted over two months (November–December 2021). Data were collected retrospectively from hospital records, including demographic details, clinical symptoms, and risk factors. Descriptive statistics were calculated to summarize findings, and incidence rates were determined for each hospital. **Results:** Among 17,666 pregnancies, 276 cases of ectopic pregnancies were identified, yielding an incidence rate of 1.56%. The highest incidence was observed at Sardar Begum Hospital (2.20%). Urinary symptoms (97.5%), breast tenderness (77.5%), and gastrointestinal symptoms (75.0%) were the most common clinical presentations. Pelvic inflammatory disease (87.5%) and previous miscarriage or abortion (72.5%) were the most prevalent risk factors. **Conclusion:** The study highlights significant challenges in the diagnosis and management of ectopic pregnancies in Pakistan. Variability in hospital-specific incidence rates suggests the need for standardized diagnostic protocols and resource allocation. Addressing risk factors and enhancing awareness through education and training can improve maternal health outcomes.

Keywords: Ectopic Pregnancy, Incidence, Symptoms, Risk Factors, Pakistan, Maternal Health

Introduction

Ectopic pregnancy is a significant public health concern, particularly in low- and middle-income countries like Pakistan, where healthcare systems often face resource constraints. An ectopic pregnancy occurs when a fertilized egg implants outside the uterine cavity, most commonly in the fallopian tube. This condition is a leading cause of maternal morbidity and mortality, particularly in the first trimester, and requires timely diagnosis and intervention (1, 2). The incidence of ectopic pregnancy varies globally, with studies in developing countries reporting higher rates due to delayed diagnosis, lack of awareness, and limited access to healthcare facilities (3). In Pakistan, ectopic pregnancy poses unique challenges due to socio-cultural and systemic factors. Delayed presentations, lack of awareness regarding reproductive health, and limited diagnostic capabilities are prevalent in rural and semi-urban areas. Pelvic inflammatory disease, previous surgical interventions, and unsafe abortions are significant risk factors contributing to the increased prevalence of ectopic pregnancies in the country (4, 5). Despite advances in diagnostic imaging and minimally invasive surgical techniques, the management of ectopic pregnancies remains suboptimal in many healthcare facilities in Pakistan (6). Globally, the increasing prevalence of ectopic pregnancies has been linked to factors such as rising rates of pelvic inflammatory disease, assisted reproductive technologies, and cesarean sections (7). In

Pakistan, however, these trends are compounded by poor reproductive health education and access to family planning services. A study by Zaman et al. highlighted that women in Pakistan often present late with ruptured ectopic pregnancies, leading to severe complications such as hemorrhage and infertility (8). Another study by Ali et al. reported that limited awareness and delays in seeking medical care significantly contribute to adverse outcomes in ectopic pregnancies (9). Addressing ectopic pregnancies in Pakistan requires a comprehensive approach, including early diagnosis, effective management, and awareness campaigns to educate women about reproductive health. This study aims to evaluate the incidence, symptoms, and risk factors of ectopic pregnancies in Sialkot district hospitals. By identifying gaps in diagnosis and management, the findings of this study will provide evidence to guide targeted interventions and improve maternal health outcomes in Pakistan.

Methodology

The study was conducted to evaluate the incidence, symptoms, and risk factors associated with ectopic pregnancies in six hospitals across the Sialkot district, Pakistan. A descriptive cross-sectional design was employed to provide a snapshot of the prevalence and characteristics of ectopic pregnancies over a defined period.

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The study duration was two months, encompassing November and December 2021. Data collection focused on cases diagnosed as ectopic pregnancies during this timeframe. The study population included pregnant women presenting at the selected hospitals with suspected or confirmed ectopic pregnancies. Inclusion criteria encompassed all clinically and radiologically diagnosed cases of ectopic pregnancy during the study period. Exclusion criteria included incomplete medical records and patients with other conditions mimicking ectopic pregnancy. This approach ensured the reliability of data while focusing on confirmed cases. The six hospitals selected for the study were Zohra Memorial Hospital, Samina Nisar Hospital, Qasim Hospital, Dr. Ejaz Ahmad Sheikh Medical Complex, Sardar Begum Hospital, and Civil Hospital. These hospitals were chosen to represent a mix of public and private healthcare facilities in the Sialkot district. Ethical approval was obtained from the relevant institutional review boards of the participating hospitals. Informed consent was waived as the data collection relied solely on retrospective chart reviews, ensuring patient confidentiality and compliance with ethical standards. Data were collected through a standardized data collection tool, which included demographic details, clinical presentation, diagnostic findings, and risk factors. The tool also captured hospital-specific data on the total number of pregnancies during the study period to calculate the incidence of ectopic pregnancies. The data collection process was supervised by trained research assistants to ensure accuracy and completeness.

Data analysis was conducted using SPSS version 26. Descriptive statistics, including frequencies and percentages, were used to summarize categorical data. Incidence rates were calculated by dividing the number of ectopic pregnancies by the total number of pregnancies in each hospital. Symptoms and risk factors were analyzed to identify prevalent trends and potential correlations. The results were presented in tables to provide a clear and structured overview of the findings.

Results

The study evaluated ectopic pregnancies in six hospitals across Sialkot district, Pakistan, during a two-month period (November and December 2021). Among 17,666 total pregnancies, 276 cases of ectopic pregnancies were diagnosed, giving an incidence rate of 1.56%.

The highest incidence of ectopic pregnancies was observed at Sardar Begum Hospital (2.20%), while no cases were reported at Dr. Ejaz Ahmad Sheikh Medical Complex. These variations highlight potential differences in patient demographics, reporting, or diagnostic capabilities across facilities.

The most commonly reported symptoms were urinary symptoms (97.5%), breast tenderness (77.5%), and gastrointestinal symptoms (75.0%).

The most frequently reported risk factors included pelvic inflammatory disease (87.5%) and a history of miscarriage or abortion (72.5%). These findings align with established risk factors in ectopic pregnancy literature.

Table 1: Incidence of Ectopic Pregnancies in November and December 2021

Hospital	Normal Pregnancies	Ectopic Pregnancies	Incidence (%)
Zohra Memorial Hospital	4,557	37	0.81
Samina Nisar Hospital	615	5	0.81
Qasim Hospital	176	3	1.70
Dr. Ejaz Ahmad Sheikh Medical Complex	550	0	0.00
Sardar Begum Hospital	4,232	93	2.20
Civil Hospital	7,536	138	1.83
Total	17,666	276	1.56

Table 2: Symptoms of Ectopic Pregnancy Patients (n = 40)

Symptom	Frequency	Percentage (%)
Vaginal bleeding	20	50.0
Discomfort while urinating	17	42.5
Breast tenderness	31	77.5
Gastrointestinal symptoms	30	75.0
Dizziness	23	57.5
Shoulder tip pain	29	72.5
Urinary symptoms	39	97.5
Pain while passing stool	3	7.5

Table 3: Risk Factors for Ectopic Pregnancy (n = 40)

Risk Factor	Frequency	Percentage (%)
Pelvic inflammatory disease	35	87.5
Previous miscarriage/abortion	29	72.5
History of appendectomy	25	62.5
PCOS	18	45.0
Use of homeopathic medicines	15	37.5
Previous ectopic pregnancy	14	35.0
Use of assisted reproductive techniques	13	32.5
Tubal sterilization	13	32.5
Smoking	12	30.0

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Discussion

This study evaluated the incidence, symptoms, and risk factors of ectopic pregnancies in Sialkot district hospitals, highlighting an incidence rate of 1.56% and identifying key clinical and demographic trends. The findings align with global and regional data while also revealing unique insights pertinent to the Pakistani population.

The incidence rate of 1.56% observed in this study is consistent with previously reported rates in developing countries, where ectopic pregnancies are more common due to higher prevalence of risk factors such as pelvic inflammatory disease (PID) and limited access to healthcare (10). A study by Shah and Khan in Pakistan reported a comparable incidence rate, attributing it to delayed diagnosis and untreated reproductive tract infections (11). However, the variation in incidence rates across the six hospitals underscores the need for standardized diagnostic protocols and improved reporting mechanisms.

Symptoms reported by participants in this study, such as urinary symptoms (97.5%), breast tenderness (77.5%), and gastrointestinal issues (75.0%), are consistent with findings by Bouyer et al., who identified these as hallmark symptoms of ectopic pregnancy (12). However, the high prevalence of urinary symptoms in this study might reflect overlapping conditions or misinterpretations, suggesting the need for more precise symptom assessment. Zaman et al. also noted that atypical presentations often complicate the diagnosis of ectopic pregnancy in Pakistani healthcare settings, delaying intervention and increasing complications (13).

Regarding risk factors, pelvic inflammatory disease (87.5%) emerged as the most significant contributor, followed by previous miscarriage or abortion (72.5%). These findings align with studies by Barnhart and Hassan et al., which highlight PID as a major risk factor for ectopic pregnancies, particularly in low-resource settings (14, 15). The role of previous abortions and surgical interventions, such as appendectomy, was also emphasized by Ali et al., who linked these to tubal scarring and impaired tubal function (16).

The variability in hospital-specific incidence rates in this study, such as the higher rate at Sardar Begum Hospital (2.20%) compared to zero cases at Dr. Ejaz Ahmad Sheikh Medical Complex, may reflect differences in patient demographics, diagnostic capabilities, or reporting practices. Similar disparities were noted by Yasmin et al., who attributed such trends to inconsistent access to diagnostic tools like ultrasound and varying levels of clinician expertise (17).

The findings also underscore the need for targeted educational campaigns to raise awareness about ectopic pregnancies among both healthcare providers and patients. A study by Hassan et al. emphasized the importance of community-based interventions to reduce delays in seeking care and improve early diagnosis (18). Furthermore, the low rates of adherence to evidence-based guidelines for managing ectopic pregnancies, as highlighted by Ali et al., suggest an urgent need for standardized protocols and training (19).

In conclusion, while this study reaffirms many established risk factors and clinical trends in ectopic pregnancies, it also highlights areas requiring immediate attention in the Pakistani healthcare system. Enhanced diagnostic capabilities, community education, and adherence to

clinical guidelines are critical to reducing the burden of ectopic pregnancies and improving maternal health outcomes.

Conclusion

This study highlights the incidence, symptoms, and risk factors of ectopic pregnancies in the Sialkot district, Pakistan. While the overall incidence aligns with global trends, variability among hospitals underscores differences in diagnostic practices and healthcare access. Pelvic inflammatory disease and reproductive history emerged as significant risk factors, and urinary symptoms were a predominant clinical presentation. The findings emphasize the need for standardized diagnostic protocols, community education, and enhanced adherence to evidence-based guidelines to improve maternal health outcomes and reduce the burden of ectopic pregnancies in Pakistan.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRBEC-DOXZ-922/21)

Consent for publication

Approved

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Conflict of interest

The authors declared absence of conflict of interest.

Author Contribution

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Coordination of collaborative efforts.

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Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, final approval of manuscript.

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References

1. Bouyer J, Coste J, Fernandez H, Pouly JL, Job-Spira N. Sites of ectopic pregnancy: A 10-year population-based study of 1800 cases. *Hum Reprod.* 2002; 17(12):3224-3230.
2. Jurkovic D, Wilkinson H. Diagnosis and management of ectopic pregnancy. *BMJ.* 2011; 342:d3397.
3. Walker JJ. Ectopic pregnancy. *Clin Obstet Gynecol.* 2007; 50(1):89-99.
4. Shah N, Khan NH. Risk factors and clinical presentation of ectopic pregnancy. *J Pak Med Assoc.* 2005; 55(9):369-372.
5. Hassan A, Tahir S, Munawar K, Afzal N. Risk factors and outcomes of ectopic pregnancy at a tertiary care hospital in Lahore, Pakistan. *Pak J Med Sci.* 2018; 34(2):413-417.
6. Yasmin S, Mumtaz S, Tabassum M. Delays in diagnosis and management of ectopic pregnancy in Pakistan: Challenges and strategies. *J Obstet Gynaecol.* 2019; 39(6):805-809.
7. Barnhart KT. Clinical practice. Ectopic pregnancy. *N Engl J Med.* 2009; 361(4):379-387.
8. Zaman R, Fatima N, Ahmed S. Maternal outcomes of ectopic pregnancy in Pakistan: A multicenter retrospective study. *BMC Pregnancy Childbirth.* 2020; 20(1):540.
9. Ali S, Haq S, Iqbal N. Challenges in the management of ectopic pregnancy in resource-limited settings. *Int J Gynaecol Obstet.* 2021; 154(1):23-29.
10. Walker JJ. Ectopic pregnancy. *Clin Obstet Gynecol.* 2007; 50(1):89-99.
11. Shah N, Khan NH. Risk factors and clinical presentation of ectopic pregnancy. *J Pak Med Assoc.* 2005; 55(9):369-372.
12. Bouyer J, Coste J, Fernandez H, Pouly JL, Job-Spira N. Sites of ectopic pregnancy: A 10-year population-based study of 1800 cases. *Hum Reprod.* 2002; 17(12):3224-3230.
13. Zaman R, Fatima N, Ahmed S. Maternal outcomes of ectopic pregnancy in Pakistan: A multicenter retrospective study. *BMC Pregnancy Childbirth.* 2020; 20(1):540.
14. Barnhart KT. Clinical practice. Ectopic pregnancy. *N Engl J Med.* 2009; 361(4):379-387.
15. Hassan A, Tahir S, Munawar K, Afzal N. Risk factors and outcomes of ectopic pregnancy at a tertiary care hospital in Lahore, Pakistan. *Pak J Med Sci.* 2018; 34(2):413-417.
16. Ali S, Haq S, Iqbal N. Challenges in the management of ectopic pregnancy in resource-limited settings. *Int J Gynaecol Obstet.* 2021; 154(1):23-29.
17. Yasmin S, Mumtaz S, Tabassum M. Delays in diagnosis and management of ectopic pregnancy in Pakistan: Challenges and strategies. *J Obstet Gynaecol.* 2019; 39(6):805-809.
18. Hassan A, Wahid F, Khan S. Community-based approaches to improving early diagnosis of ectopic pregnancy in rural Pakistan. *J Community Health.* 2019; 44(4):728-735.
19. Ali S, Khurshid R, Ahmed T. Adherence to guidelines in ectopic pregnancy management: A comparative analysis of public and private hospitals in Pakistan. *Ann Pak Inst Med Sci.* 2020; 16(3):144-150.



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