Original Article

Incidence and Factors Posing Risk for Ectopic Pregnancy During the Initial Trimester of Gestation

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Abstract

Objective: To evaluate occurrence of ectopic pregnancy and identify the related dangerous aspects between individuals in the initial trimester of pregnancy.

Methodology: The descriptive cross-sectional research was carried out in the Gynae C unit of Ayub Teaching Hospital, Abbottabad, spanning from March 29, 2022, to September 29, 2022. An overall 179 individuals meeting the inclusion criteria were consecutively sampled, and their data were recorded using a pre-designed Performa. The entered data were analyzed on SPSS version 16 to calculate frequencies and means. Stratification of ectopic pregnancy was performed based on factors such as age, parity, occupation, locality, pelvic inflammatory disease (PID), previous pelvic surgery, history of preceding abortion, previous ectopic pregnancy, and past of infertility. The post-stratification Chi-Square test was applied at a 0.05% level of implication.

Results: In the first trimester of pregnancy, 24% of patients experienced ectopic pregnancies. The highest risk factor was a history of abdomino-pelvic surgery, with a frequency of 24.6%. Subfertility followed closely at 20.1%, while earlier ectopic pregnancy, history of abortion, and past of pelvic inflammatory disease (PID) were associated with rates of 17.9%, 15.1%, and 15.1%, respectively.

Conclusion: Ectopic pregnancies are notably more prevalent among women who have a prior history of infertility. In cases of first-trimester patients displaying symptoms and a background of subfertility, a heightened suspicion for ectopic pregnancy should be maintained.

Keywords: ectopic pregnancy, infertility, risk factors, pregnancy complications
Keywords: Hyperandrogenism (HA), Polycystic Ovary Syndrome (PCOS), Menstrual Irregularities (MI), Hirsutism.

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Introduction

Ectopic pregnancy, characterized by implantation of a fertilized ovum outside uterine cavity,[1] poses a significant life-threatening emergency, standing as a primary cause of maternal death and illness in the initial trimester.[2] It contributes to approximately 18% of maternal near misses, through a case casualty index of 2.85%.[3] Globally, the prevalence of ectopic pregnancy ranges from 1% to 3%, and recent years have witnessed an upward trend in its incidence worldwide.[4,5]

African countries report the highest incidence at 0.5-2.4% of live births, while lower rates are documented in Asia and the Middle East, ranging from 0.4% to 0.6% of live births.[6] In Pakistan, ectopic pregnancies constitute 4.38% of all pregnancies.[7] The etiology of ectopic pregnancy remains inadequately understood, with numerous dangerous aspects related through previous damage to the Fallopian tube, with earlier ectopic pregnancies, sexually transmitted diseases, tubal infections, pelvic adhesions, intrauterine device use, infertility, assisted reproduction, tubal surgery history, tubal sterilization, cigarette smoking, and in-utero experience to diethylstilbestrol.

Diagnosing ectopic pregnancy is challenging due to a varied clinical presentation, ranging from asymptomatic cases to acute abdomen and hemodynamic shock.[8] Improved awareness and use of progressive analytical tools, like transvaginal ultrasonography and serum beta-hCG valuation, have enhanced overall diagnosis rates.[9]

Authorship Contribution: [1,4,5,6]Concept/research design and did data collection, edit of manuscript and project management, [2,3]critical revision of the manuscript for important intellectual content, responsibility and is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Methodology

This research aimed to investigate occurrence of ectopic pregnancy and their related dangerous aspects amongst patients presenting in the first trimester at a tertiary care hospital. Recognizing ectopic pregnancy as an obstetrical emergency, timely diagnosis and management are critical in decreasing maternal morbidity and mortality. The study focused on determining the frequency of ectopic pregnancy in both inpatient and outpatient settings, addressing potential gaps in estimating accurate incidence and capturing cases managed outside traditional hospitalization. The findings aim to contribute to existing knowledge, providing local data that may guide future research on early diagnosis, risk factor identification, and timely intervention to mitigate the associated morbidity and mortality risks.

Our current cross-sectional research was carried out in the Gynae/Obstetrics department of Unit C at Ayub Teaching Hospital, Abbottabad, spanning from March to September 2022. The research encompassed all pregnant individuals in their first trimester, selected through consecutive sampling. Patients with incomplete medical history records were excluded from the study. The sample size, determined with a 95% confidence level, an anticipated ectopic pregnancy rate of 4.38%,[10] and an absolute precision of 3%, amounted to 192 participants. Ethical permission for the research remained secured from hospital's ethics committee.The primary method for diagnosing ectopic pregnancy included history-taking, medical physical examination, laboratory and radiological (ultrasound) investigations, and laparoscopy. Various variables such as age, parity, BMI, area of residence, socioeconomic status, and risk factors (pelvic inflammatory disease, earlier pelvic surgery, earlier ectopic pregnancy, history of abortion, and subfertility) remained recorded.

Data analysis employed SPSS version 20.0, with mean ± SD calculated for quantitative variables. Ectopic pregnancy occurrences were stratified based on age, parity, occupation, locality, pelvic inflammatory disease, previous pelvic surgery, past of earlier abortion, earlier ectopic pregnancy, and past of infertility. Post-stratification Chi-Square test remained applied at a 0.06% level of significance.

Results

Among patients in first trimester of pregnancy, 24% experienced ectopic pregnancy. The sample had the mean age of 31.5 ± 7.7 years, with a significant portion (41.3%) falling within the 25 to 35 years age range. The mean BMI was 25.8 ± 3.3 kg/m2, and the majority (48.6%) had a normal BMI. Table II contains the frequencies of risk factors associated with ectopic pregnancy.

Stratification of ectopic pregnancy against the risk factor variables are shown in table II.

Table I: Frequencies of risk factors of ectopic pregnancy (n=192).

Risk factors of Ectopic Pregnancy		N	%
History of previous abortion	Yes	29	15.1
	No	163	84.9
History of previous Ectopic Pregnancy	Yes	34	17.9
	No	158	82.1
History of infertility	Yes	39	20.1
	No	153	79.9
History of surgery	No	102	53.1
Abdominal	Yes	47	24.6
Pelvic	Yes	26	13.4
D&C	Yes	17	8.9
History of PID	Yes	29	15.1
	No	163	84.9
Total		**192**	**100.0**

Discussion

Ectopic pregnancy constitutes a critical obstetrical emergency, and the prompt identification and management of this condition play a pivotal part in minimizing maternal illness and death. In the current research cohort, the incidence of ectopic pregnancy was 24%, a rate significantly higher than the overall incidence of 1 to 2%, which can spike to 14.7/1000 pregnancies in the United States. In southeast Asia, the incidence ranges from 0.25 to 1.9%, [11] while in Pakistan, it is reported to be between 10 to 11.5/1000.[12] Our specific setup reported an incidence of 0.65% (6.7/1000).[2] A study in the United Kingdom revealed that 9.6% of patients initially diagnosed with threatened miscarriage in emergency gynecological clinics were subsequently diagnosed with ectopic pregnancy.[13] The average age in our cohort was 31 years, with the majority (41.6%) falling between 25-35 years, representing the peak reproductive age. Notably, 23% of this age group had ectopic pregnancies, surpassing the rates in other age brackets. This age distribution aligns with patterns observed in other studies conducted in Pakistan,[14] though our study did not find statistically significant differences in age groups regarding ectopic pregnancy risk, unlike a study in Gambia.[15]

Table II: Stratification of ectopic pregnancy by relevant risk factors (n=179).

Stratification Variables		Ectopic pregnancy N (%)		P value
		Yes	No	
Age (years)	17-25	10 (24.4)	31 (75.6)	0.969
	> 25-35	17 (23.0)	57 (77.0)	
	> 35-45	16 (25.0)	48 (75.0)	
Parity	Primigravida	15 (18.8)	65 (81.2)	0.138
	Multigravida	28 (28.3)	71 (71.7)	
History of previous abortion	Yes	10 (37.0)	17 (63.0)	0.086
	No	33 (21.7)	119 (78.3)	
History of previous EP	Yes	11 (34.4)	21 (65.6)	0.05
	No	32 (21.8)	115 (78.2)	
History of infertility	Yes	18 (50.0)	18 (50.0)	0.001
	No	25 (17.5)	118 (82.5)	
History of previous surgery	Yes	24 (25.3)	71 (74.7)	0.036
	Abdominal	8 (18.2)	36 (81.8)	
	Pelvic	3 (12.5)	21 (87.5)	
	D&C	8 (50.0)	8 (50.0)	
History of PID	Yes	1 (3.7)	26 (96.3)	0.037
	No	42 (27.6)	110 (72.4)	
Total		43 (24.0)	136 (76.0)	

Among our study participants, 55.3% were multiparous, with 28.3% experiencing ectopic pregnancies. While there was no statistically significant difference between primigravida and multigravida concerning ectopic pregnancy occurrence, this finding is consistent with other studies attributing higher risk to multiparity due to factors like pelvic inflammatory disease (PID).[16,17]

Identified risk factors included abdomino-pelvic surgery, infertility, previous ectopic pregnancy, history of abortion, and PID. Interestingly, while PID is commonly cited as a significant risk factor in most studies, it did not emerge as prominently in our study. [7,15,18] The most frequently identified dangerous aspects in our cohort was a previous past of abdomino-pelvic surgeries, though no statistical significance was found. Tubal damage resulting from prior surgery was related to a notable increase in ectopic pregnancy risk[19], but evidence regarding non-tubal surgery is conflicting.[20]

Our study identified infertility as the statistically significant dangerous aspect for ectopic pregnancy, consistent with findings in various researches. [2,11,19,20] Incidence was found to be higher in patients undergoing infertility treatment compared to those conceiving spontaneously. The number of previous ectopic pregnancies also emerged as a significant risk factor,[21,22] indicating a persistence in underlying tubal pathology. Additionally, a history of abortion was a strong risk factor in our cohort, similar to other studies.[24,25]

Despite the classic presentation of amenorrhea, abdominal pain, and bleeding, atypical presentations of ectopic pregnancy are relatively common. Enlarged awareness and information of dangerous aspects are crucial for initial and correct analysis. Considering the possibility of ectopic pregnancy in women of reproductive age, based on risk factors, history, and examination, can contribute to improved outcomes and reduced misdiagnosis rates in primary care or accident and emergency settings.

Conclusion

An ectopic pregnancy represents a significant emotional and medical challenge within a woman's reproductive journey. This complication frequently arises during infertility treatments, potentially leading to infertility. Consequently, the approach to management should consistently prioritize enhancing future fertility. Within the chosen population, ectopic pregnancies are prevalent and hold statistical significance, particularly among females having the past of infertility.

Recommendations: A high suspicion of ectopic pregnancy should be considered in patients of first trimester with symptoms and history of subfertility. More studies with large sample size preferably cohort researches must remain conducted to stratify risk aspects for local practice policy and recommendations.

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