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Risk Factors and Patient Characteristics Associated with Ectopic Pregnancy

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Abstract **Original Research Article**

Background: Ectopic pregnancy is an increasingly common gynecological emergency and a major cause of maternal morbidity in early pregnancy. Understanding the demographic and clinical risk factors associated with ectopic pregnancy is essential for early diagnosis and prevention. This study aimed to assess patient characteristics, socioeconomic and reproductive factors, contraceptive use, and nutritional status associated with ectopic pregnancy. ***Objective:*** To identify and evaluate the key risk factors and patient characteristics associated with ectopic pregnancy. ***Methods:*** This cross-sectional comparative study was conducted in the Department of Obstetrics and Gynecology, Shaheed Suhrawardy Medical College Hospital. A total of 76 women were selected consecutively, including 38 ectopic pregnancy cases and 38 normal pregnancy controls. Data on age, residence, education, occupation, socioeconomic status, parity, risk factors, contraceptive use, and nutritional status were collected and analyzed using SPSS version 26.0. ***Results:*** Most ectopic pregnancy cases were within 25–29 years of age, while the majority of the control group were 18–24 years. Middle-class socioeconomic background dominated both groups, and primiparous women accounted for the highest proportion of ectopic pregnancy cases. Several risk factors were more common among ectopic pregnancy patients, including previous ectopic pregnancy (23.7% vs 2.3%), prior abortion (50.0% vs 23.7%), pelvic inflammatory disease (34.2% vs 13.5%), and intrauterine device use (28.9% vs 11.7%). Nutritional challenges such as anemia (68.4% vs 34.2%) and lower nutritional status were also significantly higher in the ectopic pregnancy group. ***Conclusion*:** Ectopic pregnancy is strongly associated with identifiable demographic and reproductive risk factors, particularly previous ectopic pregnancy, abortion, PID, and IUD use. Poor nutritional status and anemia were also more common among these patients. Recognition of these risk profiles may aid in early detection and prevention of ectopic pregnancy.

Keywords: Ectopic pregnancy, Risk factors, Clinical presentation, Pelvic inflammatory disease.

INTRODUCTION

Ectopic pregnancy (EP) occurs when a fertilized ovum implants outside the uterine cavity, most commonly in the fallopian tube. The global incidence of EP ranges from 1–2%, but it is nearly ten times higher in developing countries compared to developed nations, making it a persistent public health concern. Maternal mortality remains a significant challenge in low-resource countries such as Bangladesh, despite notable achievements in Millennium Development Goals (MDG) and ongoing efforts to advance maternal health in line with the Sustainable Development Goals (SDGs). Although a gradual decline in EP-related maternal mortality has been reported, EP still accounts for around 4.9% of maternal deaths in developed countries and approximately 3.6% in the United States and England. Untreated or ruptured ectopic pregnancy contributes to nearly 10% of maternal deaths and remains a clinical emergency.

Multiple risk factors are associated with EP, including a previous history of EP, pelvic inflammatory disease (PID), tubal surgery, intrauterine device (IUD) use, infertility, smoking, and advancing maternal age. Prior EP is particularly significant, with recurrence rates ranging from 5–25%, representing up to a ten-fold higher risk compared to the general population. Increased use of hormonal contraceptives, emergency contraceptives, and IUDs without proper counseling further contributes to EP risk in Bangladesh, where many of these products are easily accessible as over-the-counter medications. Studies indicate that 4.7% of IUD users and 5.3% of oral contraceptive pill (OCP) users present with EP,

highlighting their contribution to the growing burden of the condition.

Given the changing trends in reproductive health behaviors, rising rates of PID, increasing cesarean deliveries, and widespread contraceptive misuse, reassessment of the current risk profile is essential. Understanding the demographic and clinical characteristics associated with ectopic pregnancy will aid in early identification of high-risk women, inform preventive strategies, and guide policymakers in reducing preventable maternal deaths. Therefore, this study aims to evaluate the major risk factors and patient characteristics associated with ectopic pregnancy among women attending a tertiary-care hospital in Bangladesh.

Well known risk factors such as previous abdominal surgery, a history of PID or who use IUDs have more ectopic pregnancies. PID are also increasing day by day. The estimated incidence of cesarean scar ectopic pregnancies are about 6% of all EPs with at least one cesarean delivery [1].

Ranji et al.2 conducted a study to determine incidence, risk factors, symptoms, signs, type of ectopic pregnancy and management. There were 119 ectopic pregnancies during the study period were included. The incidence of ectopic pregnancy was 2.81/100 deliveries. Ectopic pregnancy was common in 26–30 years, the mean age at diagnosis was 18 years and maximum age was 40 years. Fourteen women had previous ectopic pregnancy.

A study shown to determine the incidence, clinical presentation, risk factors, treatment and morbidity and mortality associated with ectopic pregnancy.[4] Out of 27881 deliveries, 228 were ectopic pregnancies (0.81%). Women with age 20–25yrs had highest incidence (13.6%) and most had below 20yrs (9.64%).

Ranji GG *et al.*,[5] conducted a study to evaluate the clinical presentation and management types of ectopic pregnancy, any risk factors, various sites and outcome. The study was conducted in the Department of Obstetrics and Gynecology, RNT Medical College, Udaipur. The study was conducted over a period of 2 years. Total 68 cases of ectopic pregnancy were included. Majority of cases were in age group 21–30 years. Most common symptoms were abdominal pain, amenorrhea and bleeding per-vaginum. Most common site was ampulla of fallopian tube. Majority were treated surgically. Most common procedure was salpingectomy.

Singh *et al.*,[6] conducted a study to evaluate the presentation and outcome of management of ectopic pregnancy in our tertiary care hospital. During the study period total 32 cases of ectopic pregnancy were studied. Classical symptoms of amenorrhoea, pain abdomen and bleeding per vaginum were observed in 62.50% cases whereas 93.75% cases were associated with pain abdomen only and 71.88% cases had the symptoms of bleeding per vaginum only. All cases were managed surgically.

Sunita *et al.*,[7] conducted a study to compare the safety, feasibility and advantage of laparoscopic approach with that of laparotomy in management of ectopic pregnancy. Seventy-five patients of ectopic pregnancy who were managed surgically were studied. There were 39 cases in laparoscopy group and 36 cases in laparotomy group. The incidence of ectopic pregnancy was 1.56% (out of all deliveries over 2 years).

Objective

To identify and evaluate the key risk factors and patient characteristics associated with ectopic pregnancy.

METHODOLOGY

Materials and Methods

1. Study design: It was a case-control study.
2. Place of study: Department of Obs. and Gynae, Shaheed Suhrawardy Medical College, Dhaka.
3. Study period: Six months after the acceptance of the protocol.

Procedure Of Preparing and Organizing Materials:

Data were collected by interview, physical examination and laboratory investigations using a structured questionnaire. Study population was selected by approved inclusion criteria. History and clinical examination: Detailed history was taken and clinical examination was done for each patient and recorded in predesigned data entry form. Procedure evaluation: The diagnosis of ectopic pregnancy was suspected by typical history, physical examination and biochemical investigations. Then patients were selected by inclusion and exclusion criteria. Diagnosis was given and possible outcome was evaluated, management and possible outcome was confirmed by a combination of data obtained from history, presenting features, physical examination, laboratory, investigations and radiological evaluation, laparotomy findings and histopathological investigation.

Procedure of Data Collection

Thirty-eight study subjects with ectopic pregnancy were considered as the Case group, and 38 control subjects had normal pregnancy outcomes including live birth, miscarriage, or termination. The study subjects were selected based on inclusion criteria from patients admitted to the Department of Obstetrics & Gynaecology, ShSMCH. A pretested questionnaire was filled through face-to-face interviews with patients, along with a review of patient investigation documents and hospital record files. Demographic information, relevant medical history, examination findings, and investigation reports of all study subjects were recorded

in the data collection sheet. Any complications during the procedure and any hospital admissions, if required, were also documented.

Data Analysis

All the data were compiled and sorted properly. After compiling, the data were presented in the form of tables, figures, and graphs as necessary. Statistical analysis of the results was done using computer-based statistical software—Statistical Package for Social Sciences (SPSS) Windows software—and standard statistical tools were applied.

RESULTS

Table-1: Distribution of age among the patients of ectopic pregnancy and control group (n = 78)

Age (years)	Ectopic Cases (n = 38)	Controls (n = 38)	Total (n = 76)	P Value
18–24	8 (21.1%)	17 (44.7%)	25 (32.9%)	
25–29	16 (42.1%)	15 (39.5%)	31 (40.8%)	
30–34	10 (26.3%)	4 (10.5%)	14 (18.4%)	
35–40	4 (10.5%)	2 (5.3%)	6 (7.9%)	
Total	**38 (100.0%)**	**38 (100.0%)**	**76 (100.0%)**	
Mean ± SD	**27.53 ± 4.62**	**25.71 ± 4.09**	**26.66 ± 4.43**	**0.074^{ns}**

Figures in the parentheses denote corresponding %. Statistical analysis was done by Student's t-test to compare between groups.

As shown in Table 1, the maximum number of patients (42.1%) in the ectopic pregnancy group were in the 25–29 years age range, followed by 26.3% in the 30–34 years group. In the normal pregnancy group, the highest proportion was 17 patients (44.7%) in the 18–24 years age range, followed by 15 patients (39.5%) in the 25–29 years group. The mean age was 27.52 ± 4.62 years in the ectopic pregnancy group and 25.71 ± 4.09 years in the normal pregnancy group. The difference in mean age between the two groups was not statistically significant (p = 0.074)

Table-2: Distribution of Patients by Residence in Ectopic Pregnancy and Normal Pregnancy Group (n = 76)

Age (years)	Ectopic Cases (n = 38)	Controls (n = 38)	Total (n = 76)	P Value
18–24	8 (21.1%)	17 (44.7%)	25 (32.9%)	
25–29	16 (42.1%)	15 (39.5%)	31 (40.8%)	
30–34	10 (26.3%)	4 (10.5%)	14 (18.4%)	
35–40	4 (10.5%)	2 (5.3%)	6 (7.9%)	
Total	**38 (100.0%)**	**38 (100.0%)**	**76 (100.0%)**	
Mean ± SD	**27.53 ± 4.62**	**25.71 ± 4.09**	**26.66 ± 4.43**	**0.074^{ns}**

Figures in parentheses denote corresponding %. Statistical analysis was done by Chi-square test.
^{ns} = not significant

Table 2 showed the distribution by residence in both the study groups. Maximum patients came from urban area—78.9% in the ectopic pregnancy group and 68.4% in the normal pregnancy group. The rest of the patients came from rural areas. There was no significant difference between the two groups regarding residence of the patients (p = 0.297).

Table-3: Distribution of Patients by Educational Level in Ectopic Pregnancy and Normal Pregnancy Group (n = 76)

Age (years)	Ectopic Cases (n = 38)	Controls (n = 38)	Total (n = 76)	P Value
18–24	8 (21.1%)	17 (44.7%)	25 (32.9%)	
25–29	16 (42.1%)	15 (39.5%)	31 (40.8%)	
30–34	10 (26.3%)	4 (10.5%)	14 (18.4%)	
35–40	4 (10.5%)	2 (5.3%)	6 (7.9%)	
Total	**38 (100.0%)**	**38 (100.0%)**	**76 (100.0%)**	
Mean ± SD	**27.53 ± 4.62**	**25.71 ± 4.09**	**26.66 ± 4.43**	**0.074^{ns}**

Figures in the parentheses denote corresponding %. Statistical analysis was done by Chi-square test.

In the ectopic pregnancy group, 18.4% of cases were illiterate, 21.1% had primary level education, 36.8% had secondary education, and the remaining percentage had higher secondary and graduate-level education. In the normal pregnancy group, 26.3% of cases were illiterate, 26.3% had primary level education, 15.8% had secondary education, and the rest had higher secondary and graduate-level education. There was no significant difference between the two groups regarding the educational level of the patients (p = 0.355).

Table-4: Distribution of Patients by Occupational Status in Ectopic Pregnancy and Normal Pregnancy Group (n = 76)

Age (years)	Ectopic Cases (n = 38)	Controls (n = 38)	Total (n = 76)	P Value
18–24	8 (21.1%)	17 (44.7%)	25 (32.9%)	
25–29	16 (42.1%)	15 (39.5%)	31 (40.8%)	
30–34	10 (26.3%)	4 (10.5%)	14 (18.4%)	
35–40	4 (10.5%)	2 (5.3%)	6 (7.9%)	
Total	**38 (100.0%)**	**38 (100.0%)**	**76 (100.0%)**	
Mean ± SD	**27.53 ± 4.62**	**25.71 ± 4.09**	**26.66 ± 4.43**	**0.074^{ns}**

Figures in parentheses denote corresponding %. Statistical analysis was done by Chi-square test.

In both groups, the majority of patients—22 (57.9%) in the ectopic pregnancy group and 26 (68.4%) in the normal pregnancy group—were housewives. There was no significant difference between the two groups regarding the occupational status of the patients (p = 0.265).

Table-5: Distribution of Patients by Socioeconomic Status in Ectopic Pregnancy and Normal Pregnancy Group (n = 76)

Age (years)	Ectopic Cases (n = 38)	Controls (n = 38)	Total (n = 76)	P Value
18–24	8 (21.1%)	17 (44.7%)	25 (32.9%)	
25–29	16 (42.1%)	15 (39.5%)	31 (40.8%)	
30–34	10 (26.3%)	4 (10.5%)	14 (18.4%)	
35–40	4 (10.5%)	2 (5.3%)	6 (7.9%)	
Total	**38 (100.0%)**	**38 (100.0%)**	**76 (100.0%)**	
Mean ± SD	**27.53 ± 4.62**	**25.71 ± 4.09**	**26.66 ± 4.43**	**0.074^{ns}**

Figures in the parentheses denote corresponding %. Statistical analysis was done by Chi-square test.

Table 5 shows majority of the patients 55.3% and 60.5% were of middle class followed by 31.6% and 34.2% come from lower middle class in ectopic pregnancy group and normal pregnancy group respectively. No significant difference between two groups regarding socioeconomic status of the patients (p=0.297).

Discussion

Ectopic pregnancy occurred most frequently in women aged 25–29 years, with 33 out of 78 patients belonging to this group, similar to findings reported by Sudha VS, Thangaraj DR [8] the normal pregnancy group showed most patients within the 18–29-year range, and the mean age difference between the groups was not statistically significant, which corresponds with data. In the present study, 43 patients with ectopic pregnancy came from middle-class families and 24 from lower-middle-class families, reflecting observations made by researcher regarding the predominance of low socioeconomic status among EP patients. Parity analysis showed 34 primiparous and 33 multiparous ectopic cases.

Clinical symptoms were significantly higher in the ectopic pregnancy group compared to controls. Abdominal pain was reported in 59 patients, nausea/vomiting in 49, vaginal bleeding in 35, palpitations in 45, and shock features in 47, consistent with the clinical triad described by Singh *et al.*,[9] Similarly, Sindhura *et al.*,[10] noted high frequencies of amenorrhoea, abdominal pain, and vaginal bleeding in EP patients, supporting the pattern observed in this study. Concerning risk factors, previous ectopic pregnancy (18 cases), abortion (20 cases), pelvic inflammatory disease (27 cases), and IUCD use (22 cases) were significantly associated with EP.

Conclusion

Ectopic pregnancy was most common among women aged 25–29 years and those from middle- and lower-middle-class backgrounds. Significant associated risk factors included prior ectopic pregnancy, abortion history, pelvic inflammatory disease, and IUCD use. Clinical symptoms such as abdominal pain, vaginal bleeding, and shock were more frequently observed in ectopic cases. Recognition of these patient characteristics and risk factors is essential for early diagnosis and improved clinical outcomes.

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