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Pattern and Risk Factors of Ectopic Pregnancy in a Private Tertiary Care Setting of Dhaka City in Bangladesh

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Abstract

Background: Ectopic pregnancy frequently occurs among women of reproductive age. **Objective:** The objective of the present study was to determine the incidence and socio-demographic characteristics of patients with ectopic pregnancy. **Methodology:** This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Bangladesh Medical College Hospital, Dhaka, Bangladesh, from January 2009 to December 2009, covering a period of one year. All clinically suspected cases of ectopic pregnancy among women of reproductive age admitted to the department were included. A detailed history was obtained, with particular attention to menstrual, obstetric, and contraceptive histories, followed by a thorough physical examination. The diagnosis of ectopic pregnancy was confirmed through relevant laboratory investigations and imaging studies. **Results:** The incidence of ectopic pregnancy at Bangladesh Medical College Hospital was 2.16%. The mean age of the study population was 24.0 ± 2.87 years. Ectopic pregnancy showed a strong association with higher parity, with para 2 being the most common (20 cases, 44.0%). The predominant risk factors included pelvic infection (33%), previous history of abortion or menstrual regulation (28%), and infertility (25%). A history of tuberculosis was reported in only 3.0% of cases. **Conclusion:** In conclusion, young women of parity two with a history of pelvic infection, abortion, or menstrual regulation were found to be most commonly affected by ectopic pregnancy. *[Journal of National Institute of Neurosciences Bangladesh, January 2025;11(1):75-80]*

Keywords: Ectopic pregnancy; Risk factors; socio-demographic characteristics

Introduction

Ectopic pregnancy remains a major public health concern among women of reproductive age[1]. Without prompt diagnosis and appropriate management, it can become a life-threatening condition. It is recognized as a leading cause of maternal morbidity, mortality, and fetal loss. In fact, ectopic pregnancy accounts for about 9% of all pregnancy-related deaths and is the most frequent cause of maternal death during the first trimester[2]. Apart from the immediate complications, it can also impair a woman's future fertility potential[3].

Earlier reports have documented poor outcomes, with only 5 out of 30 patients surviving after undergoing abdominal surgery4. Historically, at the beginning of the 20th century, the survival rate of untreated ectopic pregnancies was merely one in three. However, significant advancements in anesthesia, antibiotics, and blood transfusion have led to a marked decline in maternal mortality rates. During the early 20th century, approximately 200 to 400 deaths occurred per 10,000 cases of ectopic pregnancy[5]. According to the Centers for Disease Control and Prevention (CDC), the number of reported ectopic pregnancies increased to about 108,800 cases, but the case fatality rate decreased significantly-from 35.5 deaths per 10,000 cases in 1970 to 2.6 per 10,000 cases[6].

Ectopic pregnancy occurs in approximately 2% of all pregnancies in the United States, with a global incidence

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ranging from 3% to 4%. Some studies have reported even higher rates-up to 16 cases per 1,000 pregnancies[7]. The apparent rise in incidence over the past two decades can be attributed both to an increase in predisposing factors and to improved diagnostic methods. Factors contributing to this trend include higher rates of pelvic inflammatory disease (PID), widespread use of various contraceptive methods and assisted reproductive technologies, and an increase in tubal surgeries[8-9].

One study found that acute salpingitis was the most frequent cause, accounting for about 50% of ectopic pregnancies[3]. Salpingitis leads to peritubal adhesions, partial or complete tubal blockage, intratubal scarring, diverticula, and impaired tubal motility. The infection may be caused by Chlamydia trachomatis, Neisseria gonorrhoeae, Mycobacterium tuberculosis, or may follow abortion, childbirth, or pelvic peritonitis. Occasionally, the infection may originate from extragenital sources such as appendicitis[10].

Various contraceptive methods have also been implicated, as they prevent intrauterine implantation but not tubal or ovarian implantation[11]. Previous tubal surgeries, congenital anomalies of the fallopian tubes, mucosal defects, and even chromosomal abnormalities of the embryo can contribute to the development of ectopic pregnancy. Given these considerations, the present study was conducted to assess the incidence and socio-demographic characteristics of patients diagnosed with ectopic pregnancy.

Methodology

Study Settings and Population: This was a descriptive, cross-sectional study conducted to assess the incidence and socio-demographic characteristics of ectopic pregnancy among women of reproductive age. The study was carried out in the Inpatient Department of Obstetrics and Gynaecology at Bangladesh Medical College Hospital (BMCH), located in Dhaka, Bangladesh. The study period extended from January 2009 to December 2009, covering a total duration of one year. All clinically suspected cases of ectopic pregnancy admitted to the Department of Obstetrics and Gynaecology during the study period were included in the investigation. The target population comprised women aged between 15 and 45 years, representing the reproductive age group. Only those who were clinically or diagnostically confirmed as cases of ectopic pregnancy were enrolled. Patients admitted with other obstetric or gynaecological conditions unrelated to ectopic pregnancy were excluded from the study. This ensured that the analysis focused solely on confirmed or suspected ectopic pregnancy cases.

Study Procedure: A consecutive purposive sampling technique was employed for participant selection. All patients fulfilling the inclusion and exclusion criteria during the study period were consecutively included until the desired sample size was achieved. After obtaining informed consent, a comprehensive clinical assessment was performed for each patient. A detailed medical and reproductive history was obtained, with special attention to menstrual patterns, previous pregnancies, abortions or menstrual regulation (MR), contraceptive practices, and any history of pelvic inflammatory disease or infertility. A thorough physical examination was conducted in all cases, emphasizing abdominal and pelvic findings. In the majority of patients, ectopic pregnancy was diagnosed on clinical grounds based on presenting symptoms and examination findings. In cases where the diagnosis was uncertain, supportive investigations such as urine pregnancy test, serum beta-human chorionic gonadotropin (β-hCG) measurement, and pelvic ultrasonography were performed to confirm the diagnosis. Data were systematically collected on the initial presentation, chief complaints, socio-demographic variables, obstetric and gynaecological history, history of previous pelvic or abdominal surgeries (including tubal, ovarian, or uterine procedures), history of infertility, use of ovulation-inducing agents, and contraceptive usage patterns. Information was recorded using a pretested, semi-structured questionnaire and a checklist designed specifically for the study. These tools were developed in accordance with the study objectives and included all relevant clinical and socio-demographic variables. The questionnaire was prepared in English and pretested for clarity, consistency, and content validity before the commencement of data collection. All data were collected personally by the principal investigator, ensuring uniformity and reliability of information. Additionally, laboratory findings and treatment details of the patients were documented from hospital records.

Statistical Analysis: All collected data were thoroughly checked, cleaned, and validated to ensure completeness and accuracy. Omissions and inconsistencies were identified and corrected through careful re-examination of the questionnaires and hospital records. After cleaning, the data were coded and entered into a computerized database using the Statistical Package for Social Sciences (SPSS) software, version 12.0 for Windows. Quantitative variables (such as age) were expressed as mean ± standard deviation (SD).

Qualitative variables (such as parity, risk factors, or presenting symptoms) were summarized as frequency distributions and percentages. All statistical analyses were conducted with a 95% confidence interval (CI), and a p-value of less than 0.05 was considered statistically significant.

Ethical Consideration: Before initiating the study, the complete research protocol was submitted to and approved by the Local Ethical Committee of Bangladesh Medical College Hospital, Dhaka. Each participant was informed about the purpose, objectives, procedures, potential risks, and benefits of the study. Confidentiality and anonymity of the participants were strictly maintained throughout the research process. Written informed consent was obtained from all respondents prior to data collection and interview. Participation in the study was voluntary, and patients retained the right to withdraw at any stage without any impact on their medical care.

Results

A total of 2,138 patients were admitted to the Inpatient Department of Obstetrics and Gynaecology at Bangladesh Medical College Hospital, Dhaka, Bangladesh during the one-year study period. Among them, 48 patients were diagnosed with ectopic pregnancy. These cases were subsequently analyzed in detail to identify the associated risk factors, clinical features, and management approaches, along with their respective treatment outcomes. The incidence of ectopic pregnancy observed in this study was 2.16% cases (Figure I).

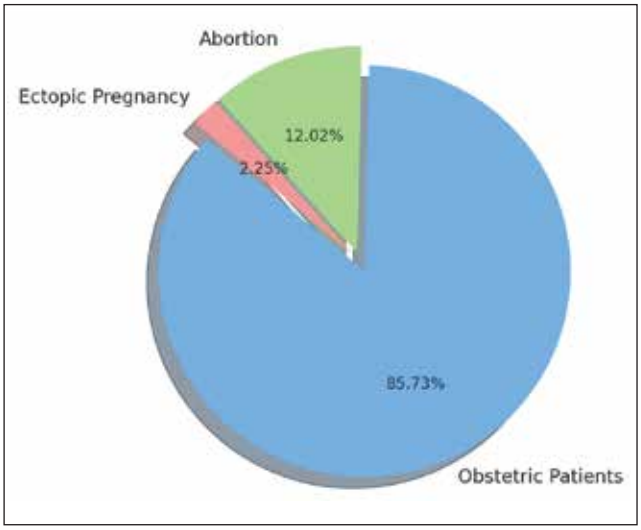

Figure I: Incidence of Ectopic Pregnancy

The majority of patients were within the 21–25 years age group, comprising 20 cases (41.66%). This was followed by the under-20 years group and the 26–30 years group, which included 14 cases (30.55%) and 10 cases (19.44%), respectively. Only 4 patients (8.33%) were aged above 30 years. The mean age of the study population was 24.0 ± 2.87 years (Table 1).

Table 1: Distribution of Ectopic Pregnancy Cases according to age

Age Group	Frequency	Percent
Less than 20 Years	14	30.55
21 to 25 Years	20	41.66
26 to 30 Years	10	19.44
More than 30 Years	4	8.33
Total	**48**	**100.0**
Mean±SD age	24.0±2.87	

The ectopic pregnancy was closely related with high parity and it had been found that para-2 was the most common which was 20(44%) cases followed by para 3 and para 1 which was 12(22.6%) cases and 9(16.4%) cases respectively. However, para 4 and para 0 were in 6(11.1%) cases and 4(5.5%) cases respectively (Figure II).

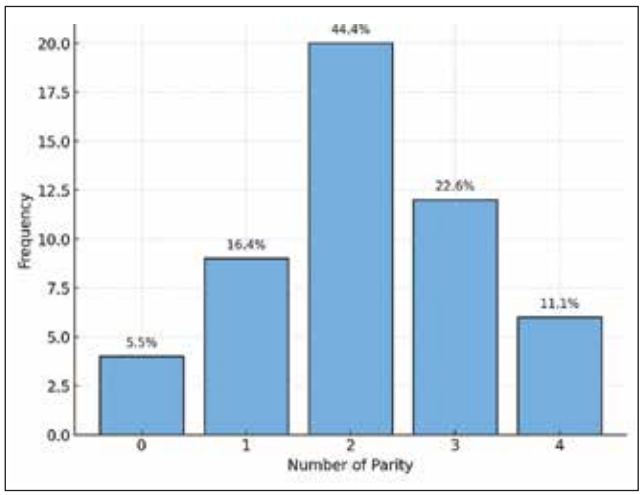

Figure II: Ectopic Pregnancy Cases According to Parity

The distribution of cases according to predisposing factors were recorded. Pelvic infection (33.0%), past history of abortion or MR (28.0%), and history of infertility (25.0%) were constituted the main bulk of risk factors. Only 3.0% cases had a history of tuberculosis. It had been found that 6.0% patients had a history of appendicitis and another 6.0% patients had a history of lower abdominal surgery and 3.0% patients were IUCD users (Table 2).

Table 2: Distribution of Cases According to Predisposing Factors

Risk Factors	Frequency	Percent
Previous abortion/MR	12	27.8
Ectopic Pregnancy	0	0.0
Infertility	8	25.0
Pelvic Infection	16	33.3
Tuberculosis	2	2.8
Appendicitis	4	5.5
Lower Abdominal Surgery	4	5.5
IUCD	2	2.7
Total	**48**	**100.0**

IUCD=intrauterine Contraceptive Device

Discussion

Ectopic pregnancy holds significant clinical importance due to its association with maternal mortality, infertility, and poor reproductive outcomes in subsequent pregnancies[11]. The incidence of ectopic pregnancy differs across regions, even within the same country. In recent years, developed nations have reported an increase in incidence but a decline in mortality, largely due to advances in diagnostic techniques[12].

The present study was conducted among admitted patients of BMCH clinically diagnosed with ectopic pregnancy, revealing an incidence of 21.6 per 1,000 total pregnancies during the study period. Studies from other countries show similar upward trends. For instance, in the United States, incidence rose from 4.5 per 1,000 pregnancies in 1970 to 19.7 per 1,000 by 1992. This higher incidence in developed nations is attributed to both an increase in pelvic inflammatory disease (PID) and better diagnostic modalities. In the current study, unsafe abortion leading to PID emerged as the primary predisposing factor. Reports suggest that illegal and unsafe abortions substantially elevate the risk of ectopic pregnancy, mainly due to postoperative infections and poorly performed procedures.

Ectopic pregnancy remains a major cause of first-trimester maternal deaths, accounting for around 9% of pregnancy-related fatalities[13]. Although its incidence is increasing globally, the mortality rate has remained relatively stable. The rise is both genuine-owing to higher rates of PID, sexually transmitted infections (STIs), use of intrauterine contraceptive devices (IUCDs), progesterone-only pills, and assisted reproductive techniques-and apparent, due to improved diagnostic tools such as β-hCG assays and high-resolution ultrasonography[14]. In India, a multicentric case-control study reported an incidence of 3.12 per 1,000 pregnancies or 3.86 per 1,000 live births[15]. Swedish studies have shown that screening and treatment of Chlamydia trachomatis infections can significantly reduce ectopic pregnancy rates[13]. Meanwhile, the growing use of assisted reproductive technologies has also contributed to higher rates of multiple and ectopic gestations.

In this study, most patients (42.0%) were between 21 to 25 years of age, while only 8% were over 30, with ages ranging from 17 to 35 years. About 65.0% of cases occurred in women aged 26 to 35 years[11]. Collectively, these findings confirm that ectopic pregnancy most frequently affects women in their peak reproductive years. Following radical surgery, intrauterine pregnancy rates range from 50.0% to 70.0%, with a 6 to 16.0% recurrence rate of ectopic pregnancy. Prognosis is favorable when early diagnosis is achieved. Previously, when diagnosis was often made post-rupture, only about 30% of patients could achieve subsequent healthy pregnancies; with modern diagnostic advances, this figure has improved to nearly 85% cases[15-16]. Early detection and prompt management prevent extensive tubal damage, thereby improving fertility outcomes.

In this study, prior abortion or menstrual regulation was reported by 28.0% of patients, while 33.0% had a history of pelvic infection and 25.0% cases reported infertility. IUCD use was observed in only 3.0% of cases-lower than the 9.0% cases. Similar to findings by Kulsum15, pelvic infection, abortion/MR history, and infertility were the predominant risk factors identified. This pattern reflects low contraceptive use and a high rate of unsafe abortion in Bangladesh, where illegal abortion increases ectopic pregnancy risk up to tenfold and clinical salpingitis raises it sixfold. Several studies have confirmed strong associations between ectopic pregnancy and infections with Chlamydia trachomatis and Neisseria gonorrhoeae[15]. Although these infections were not screened in this study, previous research indicates their significant role. No cases with prior tubal surgery were recorded, though global data indicate that tubal surgery remains one of the strongest risk factors for ectopic gestation[17].

Parity-wise, 6.0% of patients were nulliparous, with the highest incidence (44.0%) among women with parity two. The frequency decreased with higher parity. Kulsum[15] observed peak incidence among para-1 (37.0%) and para-2 (25.0%) patients, while Parveen[17] also noted higher rates among women with two or more children. In about 40.0% cases, the cause of ectopic pregnancy remains unidentified, though the

most probable explanation is delayed transport of the fertilized ovum due to tubal damage or dysfunction in ciliary and smooth muscle activity. PID is widely acknowledged as the most important etiological factor, with histopathological evidence of salpingitis found in 50.0% of affected tubes[11]. Salpingitis leads to peritubal adhesions, partial occlusions, and altered tubal motility, often resulting from *Chlamydia, Gonorrhea,* tuberculosis, puerperal infections, or secondary peritonitis[11]. These findings are consistent with the current study.

In the present study, 3.0% of patients were IUCD users compared to 17.0% cases reported by Archibong and Sobanda[8]. IUCDs, especially those containing progesterone, increase the relative risk of ectopic pregnancy by preventing intrauterine implantation while not always inhibiting fertilization. Copper IUCDs, however, provide better protection due to their cytotoxic effects on gametes[13]. Use of progestin-only contraceptives may impair tubal motility and increase ectopic risk. Ectopic gestation can also occur after tubal sterilization or reversal, with risk depending on the method, site, and extent of tubal damage. After salpingostomy or salpingoplasty, incidence ranges from 15.0% to 25.0% cases, while post-sterilization reversal carries a risk of around 4.0% cases[18].

Additionally, assisted reproductive technologies such as in vitro fertilization (IVF) are associated with a 2-5% higher risk of ectopic pregnancy. Notably, the first human pregnancy achieved through IVF resulted in a tubal pregnancy, and combined intrauterine and extrauterine gestations have been reported due to retrograde embryo migration through the fallopian tube.

Conclusion

In conclusion, ectopic pregnancy is most frequently observed among women in the younger age group. The condition occurs predominantly in women with parity two. Pelvic infections and a history of abortion or menstrual regulation (MR) are the most common predisposing factors, while infertility also represents a major contributing risk. A smaller proportion of patients reported a history of tuberculosis, appendicitis, or lower abdominal surgery. Prior use of intrauterine contraceptive devices (IUCDs) was also associated with increased susceptibility to ectopic pregnancy. To better understand the true magnitude and contributing factors, larger-scale studies are recommended.

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Data Availability
Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate
Ethical approval for the study was obtained from the Institutional Review Board. As this was a prospective study the written informed consent was obtained from all study participants. All methods were performed in accordance with the relevant guidelines and regulations.

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