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Frequency of Endometriosis Detected on Diagnostic Laparoscopy Among Infertile Women – A Cross-Sectional Study

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ABSTRACT

Background: Endometriosis, the presence of endometrial-like tissue outside the uterus, is common in reproductive-age women and contributes to infertility, pain, and reduced quality of life. Diagnosis relies on laparoscopy, though subtle lesions may be missed. Prevalence in infertile women varies globally (11.5–55%) and in Bangladesh (22–46%). This study aimed to assess the prevalence of endometriosis in infertile women undergoing diagnostic laparoscopy and its association with clinical symptoms. **Methods & Materials:** This cross-sectional study at BIRDEM General Hospital-2, Dhaka (July 2020–June 2021), included 115 women aged 20–40 years with primary or secondary infertility, excluding male-factor infertility, chromosomal disorders, or primary amenorrhea. Participants underwent clinical evaluation and diagnostic laparoscopy, with endometriosis staged by r-ASRM. Demographic and clinical data were recorded. The primary outcome was the frequency of endometriosis. Ethical approval and informed consent were obtained. **Results:** The study included 115 infertile women undergoing diagnostic laparoscopy, mostly aged 26–35 years, from middle socio-economic backgrounds, predominantly housewives, and largely rural residents. Primary infertility was more common, with delayed presentation for evaluation. Endometriosis was detected in 38.3% of women. Among affected women, dysmenorrhea (68.2%) and chronic pelvic pain (61.4%) were most frequent, while dyschezia and urinary symptoms were less common, and some women were asymptomatic. Regarding severity, Stage IV (severe) disease was most common (47.7%), followed by Stage I and III (20.5% each), and Stage II (11.4%), indicating a predominance of advanced-stage endometriosis. **Conclusion**: Endometriosis significantly contributes to infertility, commonly presenting with pelvic pain. Advanced-stage disease is frequent, highlighting the need for early recognition and timely diagnostic laparoscopy for effective management**.**

Keywords: *Endometriosis, Frequency, Laparoscopy, Infertile Women, r-ASRM Staging.*

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Introduction

Endometriosis is a chronic gynecological condition defined by the presence of endometrial-like tissue outside the uterine cavity and remains one of the most common disorders affecting women of reproductive age [1]. It is frequently encountered in gynecological practice and is strongly associated with infertility, with approximately 25–50% of infertile women found to have endometriosis, while 30–50% of women diagnosed with endometriosis experience difficulty conceiving [2]. Endometriosis leads to infertility through several mechanisms, including pelvic adhesions, tubal obstruction, ovarian endometriomas, chronic inflammation, and altered pelvic anatomy. In addition to infertility, the disease causes significant morbidity in the form of dysmenorrhea, chronic pelvic pain, deep dyspareunia, dyschezia, and a reduced quality of life. Although endometriosis is clearly associated with infertility, the causal relationship, particularly in minimal and mild disease, remains controversial [3].

The diagnosis of endometriosis is primarily made by direct visualization during laparoscopy. However, the disease exhibits a wide range of appearances, from subtle superficial implants to deeply infiltrating lesions and dense adhesions. As a result, surgical diagnosis without histological confirmation may underestimate or misclassify disease extent, especially when lesions are small, atypical, or located in difficult-to-visualize areas [4]. Laparoscopic management, which includes destruction of endometriotic implants and adhesiolysis, has been shown to improve fertility outcomes. Pooled evidence indicates that operative laparoscopy is more effective than medical therapy such as danazol or expectant management in improving pregnancy rates among women with endometriosis-associated infertility [5].

The reported frequency of endometriosis among infertile women varies widely across different populations. Studies using diagnostic laparoscopy have demonstrated prevalence rates ranging from 11.5% to over 55% [6–8]. In India, hospital-based studies have reported that more than half of infertile women undergoing laparoscopy had endometriosis, with many cases being in the early stages and a considerable proportion of women being asymptomatic [6]. In contrast, studies from other South Asian and Middle Eastern populations have documented lower prevalence rates of approximately 16–22% among infertile women [7]. A retrospective analysis reported that nearly 48% of women undergoing diagnostic laparoscopy for infertility were diagnosed with endometriosis, further illustrating the variability in prevalence depending on the population studied [2]. Other studies, particularly from South India, have reported much lower frequencies, as low as 11.5% [8].

In Bangladesh, several hospital-based studies have demonstrated that endometriosis is an important contributor to female infertility. One study found that 22.7% of infertile women undergoing diagnostic laparoscopy had endometriosis, often in association with other pelvic pathologies such as tubal disease [9]. Another prospective study from Dhaka reported that 46% of women with confirmed endometriosis were infertile, with dysmenorrhea and cyclical pelvic pain being the most common presenting symptoms, and highlighted characteristic staging patterns of the disease in Bangladeshi women [10].

Despite these findings, significant gaps remain in the understanding of endometriosis among infertile women in Bangladesh. Most available studies are hospital-based with relatively small sample sizes, limited representation of asymptomatic women, and variability in laparoscopic diagnostic criteria. Moreover, the lack of standardized symptom–disease correlation and limited follow-up restrict a comprehensive understanding of the burden of the disease. Therefore, this study was designed to determine the frequency of endometriosis detected on diagnostic laparoscopy among infertile women and to assess its association with clinical symptoms and disease severity.

Methods & Materials

This cross-sectional observational study was conducted at BIRDEM General Hospital-2, Dhaka, from July 2020 to June 2021. The study aimed to determine the frequency of endometriosis detected on diagnostic laparoscopy among infertile women. A total of 115 women aged 20–40 years presenting with primary or secondary subfertility were included. Patients were eligible if they were undergoing diagnostic laparoscopy as part of their infertility evaluation. Women with infertility due to husband's factor, chromosomal disorders, or primary amenorrhea were excluded from the study.

Participants were recruited using purposive sampling. A detailed clinical evaluation was conducted for each participant, including medical and reproductive history, physical examination, and pervaginal examination. Diagnostic laparoscopy was performed under standard surgical protocols to visualize the pelvic organs and detect endometriotic lesions. Findings were documented in a predesigned data collection form, including the presence or absence of endometriosis and its severity, classified according to the revised American Society for Reproductive Medicine (r-ASRM) staging system.

Other demographic and clinical variables collected included age, type of infertility, socio-economic status, occupational status, and clinical symptoms. The primary outcome was the frequency of endometriosis detected on laparoscopy. Written informed consent was obtained from all participants prior to inclusion, and the study protocol was approved by the Institutional Review Board (IRB) of BIRDEM General Hospital. Confidentiality and adherence to ethical standards were strictly maintained throughout the study.

Results

Sociodemographic Profile and Infertility Characteristics

Table I shows the study included 115 infertile women undergoing diagnostic laparoscopy, with a mean age of 30.6 ± 3.6 years. The majority were aged 26–35 years (89.5%), indicating that infertility evaluation was most commonly sought during the late reproductive years. Most participants belonged to the middle socio-economic group (80.9%), and a large proportion were housewives (73.0%), reflecting the demographic profile of women attending BIRDEM General Hospital-2. Regarding educational status, nearly half of the women had secondary education (45.2%), while 39.1% had higher education, suggesting reasonable health literacy among the participants. Most women were residents of rural areas (67.0%), consistent with patterns of health-seeking behavior in Bangladesh. Primary infertility predominated, affecting 82.6% of participants, and the mean duration of infertility was 5.2 ± 3.1 years, highlighting delayed presentation for fertility evaluation. (*Table I*).

Table I
Sociodemographic Profile and Infertility Characteristics of the Women Undergoing Diagnostic Laparoscopy (*n* = 115).

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	20–25	4	3.5
	26–30	55	47.8
	31–35	48	41.7
	36–40	8	7.0
	Mean ± SD	30.6 ± 3.6	—
Socio-economic Status	Lower	5	4.3
	Middle	93	80.9
	Upper	17	14.8
Occupation	Housewife	84	73.0
	Service holder	26	22.6
	Business	5	4.4
Education	Primary	18	15.7
	Secondary	52	45.2
	Higher (College/University)	45	39.1
Residence	Urban	38	33.0
	Rural	77	67.0
Type of Infertility	Primary	95	82.6
	Secondary	20	17.4
Duration of Infertility (years)	≤3	22	19.1
	4–6	53	46.1
	>6	40	34.8
	Mean ± SD	5.2 ± 3.1	—

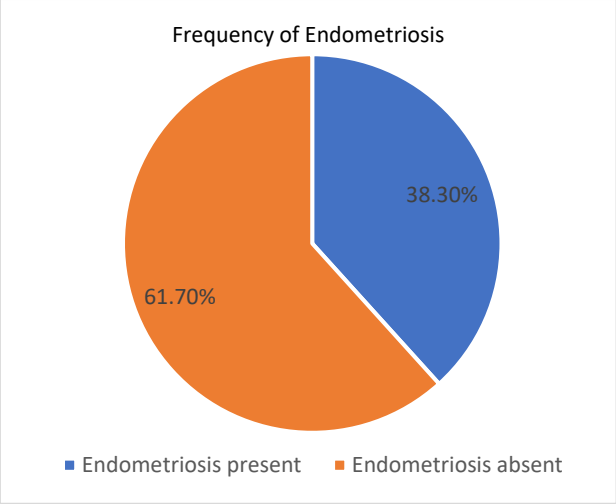

Figure 1 Frequency of Endometriosis Detected on Diagnostic Laparoscopy (*n* = 115).

Frequency of Endometriosis Detected on Diagnostic Laparoscopy

Figure 1 shows that endometriosis was detected on diagnostic laparoscopy in 38.3% (n = 44) of infertile women, while 61.7% (n = 71) had no laparoscopic evidence of endometriosis. This indicates that more than one-third of infertile women undergoing diagnostic laparoscopy had underlying endometriosis, highlighting its significant contribution to female infertility in the study population.

Clinical Presentation

Table II shows among the 44 women diagnosed with endometriosis on laparoscopy, dysmenorrhea was the most commonly reported symptom, affecting 68.2% of patients, followed by chronic pelvic pain in 61.4%. Menstrual irregularity was reported by 38.6%, while dyspareunia occurred in 36.4% of cases. Menorrhagia was present in 22.7%, dyschezia in 9.1%, and urinary symptoms in 4.5% of women. Notably, 11.4% of women with endometriosis were asymptomatic. Several patients reported more than one symptom, reflecting the variable clinical presentation of the disease.

Table II
Clinical Presentation of Infertile Women with Endometriosis (*n* = 44).

Clinical Symptom	Frequency (n)	Percentage (%)
Dysmenorrhea	30	68.2
Chronic pelvic pain	27	61.4
Menstrual irregularity	17	38.6
Dyspareunia	16	36.4
Menorrhagia	10	22.7
Dyschezia	4	9.1
Urinary symptoms	2	4.5
Asymptomatic	5	11.4

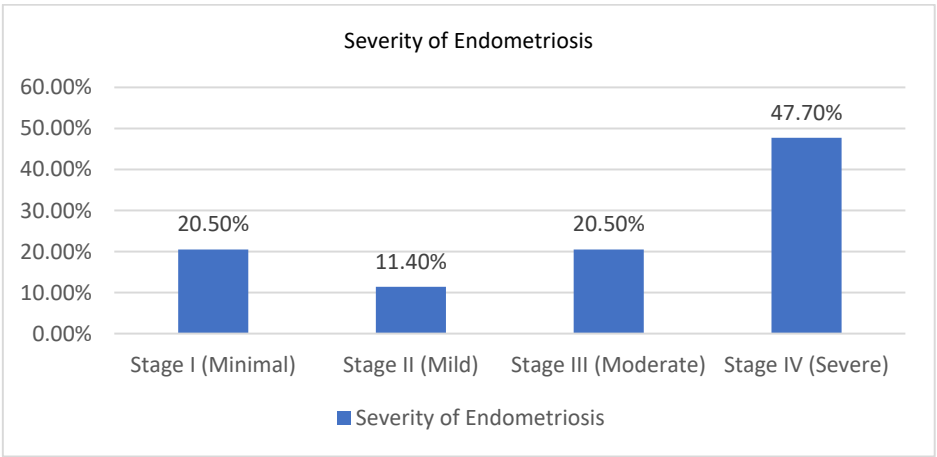

Figure 2 Distribution of Endometriosis Severity According to r-ASRM Staging (*n* = 44).

Severity of Endometriosis According to r-ASRM Staging

Figure 2 illustrates the distribution of endometriosis severity according to the revised American Society for Reproductive Medicine (r-ASRM) staging system among the 44 women diagnosed with endometriosis. Nearly half of the patients (47.7%) had Stage IV (severe) endometriosis, making it the most common stage observed. Stage I (minimal) and Stage III (moderate) disease were each present in 20.5% of cases, while Stage II (mild) endometriosis was the least frequent (11.4%). These findings indicate a predominance of advanced-stage endometriosis among infertile women undergoing diagnostic laparoscopy, suggesting delayed diagnosis and presentation in this population.

Discussion

The mean age of infertile women in our study was 30.6 ± 3.6 years, with most aged 26–35 years. This aligns with the findings of Mascarenhas et al., who reported the highest infertility prevalence among women aged 30–39 years globally [11]. Most participants were from the middle socio-economic group (80.9%), which is comparable to Bangladeshi and regional studies reporting 70–85% middle-income representation among infertile women, while lower socio-economic groups usually account for <10–15% due to financial and access barriers [12]. In the present study, most women were housewives (73%), with 45% having secondary education and 39% higher education. Similarly, Hossain SM et al. (2016) reported ~72% housewives, 50% with secondary, and 35–40% with higher education, indicating that infertile women attending tertiary centers in Bangladesh are mainly educated housewives with reasonable health awareness [13]. In this study, 67% of women were rural, aligning with national data where 56% of 2,250 infertile patients were rural, reflecting delayed access to specialized services [14]. In this study, primary infertility was predominant (82.6%) and secondary infertility 17.4%, consistent with Bangladesh and South Asia where primary infertility ranges 60–85%. This may reflect early marriage and sociocultural pressures for first-time conception [13]. The mean duration of infertility was 5.2 ± 3.1 years, with most women experiencing it for >4 years; only 19.1% sought evaluation within 3 years, similar to Hossain SM et al., where >50% had infertility >5 years, reflecting delayed health-seeking [13].

In this study, 38.3% of infertile women had endometriosis on laparoscopy, which aligns with other studies reporting 25–55% prevalence, emphasizing its significant role in infertility and the importance of laparoscopic diagnosis [6].

In our study, among 44 women with endometriosis, dysmenorrhea (68.2%) and chronic pelvic pain (61.4%) were most common, with menstrual irregularity (38.6%), dyspareunia (36.4%), menorrhagia (22.7%), and asymptomatic cases (11.4%). These results are comparable to Foti et al. (2018), who reported 70% dysmenorrhea, 65% chronic pelvic pain, 35% dyspareunia, 30% menstrual irregularity, and 10% asymptomatic, highlighting the variable clinical presentation and the importance of laparoscopy for diagnosis [15]. In this study, dyschezia (9.1%) and urinary symptoms (4.5%) were uncommon, consistent with other research showing these symptoms occur less frequently than dysmenorrhea or pelvic pain, with international studies reporting dyschezia ~34% and urinary symptoms ~10.6% in endometriosis patients [16].

In the present study, Stage IV (severe) endometriosis was the most common, affecting 47.7% (21/44) of women, followed by Stage I and III (each 20.5%, 9/44) and Stage II (11.4%, 5/44). This aligns with Lee et al. (2021), who reviewed 150 women with laparoscopically confirmed endometriosis and reported Stage IV in 45%, Stage III in 25%, Stage II in 15%, and Stage I in 15% of cases, demonstrating a similar predominance of advanced-stage disease [17]. The findings underscore that delayed diagnosis often results in higher-stage presentations, emphasizing the need for timely evaluation and management

Conclusion

Endometriosis is an important contributor to female infertility, being identified in a substantial proportion of women undergoing diagnostic laparoscopy. Infertile women were mostly in the late reproductive age group, from middle socio-economic backgrounds, predominantly housewives, and largely residing in rural areas. Primary infertility was more common, with delayed presentation for evaluation. Dysmenorrhea and chronic pelvic pain were the most frequent symptoms, while gastrointestinal and urinary complaints were less common, and some women were asymptomatic. Advanced-stage endometriosis was frequently observed, emphasizing the need for early recognition of symptoms, timely referral, and the use of diagnostic laparoscopy for accurate detection, staging, and management to improve fertility outcomes.

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