ARC Journal of Gynecology and Obstetrics
Volume 9, Issue 1, 2025, PP 26-32
ISSN 2456-0561 (Online)
DOI: https://doi.org/10.20431/2456-0561.0901005
www.arcjournals.org

Clinical Pattern of Infertility and its Association with Laparoscopic Evidence of Endometriosis

Dr. Sayeeda Pervin[1*], Dr. Nasrin Sultana[2], Dr. Bakhtiar Ahmed[3], Dr. Mst. Nargish Khanam[4], Dr. Mst. Marfa Haque[5], Dr. Zobaida Sultana Susan[6]

[1]*Assistant Professor, Department of Obstetrics and Gynaecology, Dhaka Medical College, Dhaka, Bangladesh*

[2]*Assistant professor, Department of Obstetrics and Gynaecology, Dhaka Medical College, Dhaka, Bangladesh*

[3]*Assistant Professor and Resident Surgeon, Department of Surgery, BIRDEM General Hospital, Dhaka, Bangladesh*

[4]*Junior Consultant, Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital, Dhaka, Bangladesh*

[5]*Junior Consultant, Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital, Dhaka, Bangladesh*

[6]*Junior Consultant, Department of Obstetrics and Gynaecology, Shaheed Suhrawardy Medical College and Hospital, Dhaka, Bangladesh*

Received: 28 April, 2025 Accepted: 13 May, 2025 Published: 20 May 2025

Corresponding Author:** ***Dr. Sayeeda Pervin, *Assistant Professor, Department of Obstetrics and Gynaecology, Dhaka Medical College, Dhaka, Bangladesh.*

Abstract

Background: *Endometriosis is a prevalent but often underdiagnosed cause of infertility in women, particularly in those with primary infertility. Laparoscopy remains the gold standard for its diagnosis and management. This study aimed to determine the prevalence of endometriosis among infertile women undergoing diagnostic laparoscopy and to explore its association with types of infertility.*

Methods: *This cross-sectional descriptive study was conducted at the Center for Assisted Reproduction (CARE), Department of Obstetrics & Gynaecology, BIRDEM General Hospital, Dhaka, Bangladesh, over a two-year period from July 2013 to June 2015. A total of 127 infertile women scheduled for diagnostic laparoscopy were included through convenient sampling. Demographic details, infertility type and duration, and laparoscopic findings were recorded and analyzed.*

Results: *The mean age of the participants was 29.31 ± 4.08 years. Regarding BMI, 36.22% were of normal weight, 34.65% were overweight, 24.41% were obese, and 4.72% were underweight. Secondary infertility was more common (71.65%) than primary infertility (28.35%). The mean duration of infertility was 6.14 ± 2.7 years, with over half of the participants having infertility for 5 to 10 years. Endometriosis was diagnosed in 18.9% (n=24) of participants via laparoscopy. A statistically significant association was found between endometriosis and primary infertility (p = 0.004), with 95.8% of the endometriosis cases presenting with primary infertility.*

Conclusion: *Endometriosis was a notable finding in infertile women undergoing laparoscopy, especially among those with primary infertility. Early laparoscopic evaluation is crucial for accurate diagnosis and targeted treatment, potentially improving fertility outcomes.*

Keywords: *Endometriosis, Infertility, Laparoscopy, Primary infertility, Secondary infertility.*

1. Introduction

Infertility, defined as the inability to conceive after one year of unprotected intercourse, affects approximately 10–15% of couples worldwide [1].

It is a multifactorial condition with both male and female contributors, among which endometriosis remains one of the most common causes of female infertility. Endometriosis is characterized by the presence of endometrial-like tissue outside the uterine cavity, leading to chronic inflammation, pelvic pain, and impaired fertility [2]. Despite extensive research, the exact pathophysiology linking endometriosis to infertility remains complex and multifaceted, involving anatomical distortion, inflammatory

cytokines, altered immune responses, and impaired folliculogenesis [3].

Globally, the prevalence of endometriosis among infertile women is estimated to be 25–50%, which is significantly higher than in the general population [4]. However, many cases remain undiagnosed due to the condition's variable clinical presentation and lack of correlation between symptom severity and disease extent [5]. Common symptoms include dysmenorrhea, dyspareunia, chronic pelvic pain, and menstrual irregularities. In some cases, infertility may be the only presenting complaint [6]. Laparoscopy remains the gold standard for the diagnosis and staging of endometriosis, offering both visual confirmation and therapeutic intervention.

In developing countries like Bangladesh, limited access to advanced diagnostic facilities and delayed referral contribute to underdiagnosis and mismanagement of endometriosis-related infertility [7]. Moreover, many women endure years of ineffective treatment without a definitive diagnosis. Diagnostic laparoscopy is often reserved for selected patients after failure of initial fertility treatments, which may further delay appropriate management [8]. Understanding the clinical patterns associated with endometriosis in infertile women can help guide timely diagnosis and treatment [9].

Although various international studies have reported the clinical association between endometriosis and infertility, local data from Bangladesh are scarce [10, 11]. There is a pressing need to explore the clinical presentation and burden of endometriosis among infertile women in this region, particularly using laparoscopic evidence, to optimize fertility management strategies [12].

This study was undertaken to evaluate the clinical pattern of infertility and its association with laparoscopic findings of endometriosis among women undergoing infertility evaluation. Specifically, the study aimed to assess the prevalence and severity of endometriosis detected by laparoscopy and to correlate these findings with the type and duration of infertility, clinical symptoms, and other relevant demographic and clinical characteristics.

By identifying clinical indicators that may predict the presence of endometriosis, this study seeks to contribute to earlier diagnosis, reduce unnecessary delays in management, and improve reproductive outcomes for affected women. The findings are expected to support evidence-based infertility evaluation protocols and highlight the importance of timely laparoscopic assessment in appropriate candidates.

2. Methodology & Materials

This was a cross-sectional descriptive study conducted at the Center for Assisted Reproduction (CARE), Department of Obstetrics & Gynaecology, BIRDEM General Hospital, Dhaka, Bangladesh, over two years from July 2013 to June 2015. The study population included 127 consecutive infertile women who were selected for diagnostic laparoscopy. All eligible participants were recruited conveniently based on their scheduled laparoscopic evaluation for infertility.

2.1. Selection Criteria

Inclusion Criteria

- Female patients with primary or secondary infertility undergoing diagnostic laparoscopy for evaluation at CARE, BIRDEM.
- Age range: 20 to 40 years.

Exclusion Criteria

- Infertility caused solely by male factor.
- Patients with severe medical disorders (e.g., advanced cardiac disease) are contraindicated for anaesthesia.
- Infertility due to chromosomal abnormalities or primary amenorrhea.

2.2. Data Collection Procedure

After obtaining informed written consent, detailed information was collected from each participant using a pre-designed data collection form. A complete clinical history and thorough physical examination were performed. Laparoscopic evaluation was then carried out, and findings were recorded. Endometriosis was diagnosed visually during laparoscopy, and the severity of the disease was classified using the Revised American Fertility Society (rAFS) scoring system, which categorizes the disease into four stages:

Stage I (Minimal): Few superficial implants, commonly in the cul-de-sac.

Stage II (Mild): More implants and possible ovarian involvement.

Stage III (Moderate): Multiple implants and ovarian involvement with mild adhesions.

Stage IV (Severe): Widespread implants, large endometriomas, and dense adhesions.

2.3. Study Procedure

Each patient underwent diagnostic laparoscopy as part of their infertility workup. During the procedure, findings such as endometrial implants, ovarian endometriomas, pelvic adhesions, and tubal patency were carefully documented. The staging of endometriosis was performed intraoperatively using Raff's criteria. The surgical observations were recorded systematically and used for further analysis. Additional demographic and clinical data such as age, body mass index (BMI), type of infertility, and presenting symptoms (e.g., dysmenorrhea, menorrhagia, dyspareunia, chronic pelvic pain) were also documented.

2.4. Ethical Consideration

Ethical approval for the study was obtained from the Ethical Review Committee of BADAS. Informed verbal and written consent were secured from each participant after explaining the purpose, methods, and potential risks of the study. Confidentiality was strictly maintained throughout the study. Participants were assured of their right to withdraw at any stage without any impact on their treatment.

2.5. Statistical Analysis

All collected data were checked, cleaned, and entered into SPSS software version 20 for statistical analysis. Descriptive statistics were used to summarize demographic and clinical variables using means, standard deviations, frequencies, and percentages. Inferential statistical tests, such as the Chi-square test and the t-test, were applied to explore associations between endometriosis and various clinical variables. A p-value <0.05 was considered statistically significant. Results were presented in tables and figures with appropriate legends and numbering.

3. RESULTS

Table I. *Baseline characteristics of the respondents (n=127)*

Characteristics		Frequency (n)	Percentage (%)
Mean Age (years)		29.31± 4.08	
BMI	**Under weight**	6	4.72
	Normal	46	36.22
	Over weight	44	34.65
	Obese	31	24.41
Type of infertility	**Primary infertility**	36	28.35
	Secondary infertility	91	71.65

Table I presents the baseline characteristics of the respondents. The mean age of the study participants was 29.31 ± 4.08 years, indicating that most women were within the reproductive age group. In terms of body mass index (BMI), the majority of women had either normal weight (36.22%) or were overweight (34.65%), while a smaller proportion were obese (24.41%) or underweight (4.72%). Regarding the type of infertility, secondary infertility was more prevalent, observed in 71.65% of cases, whereas 28.35% of women presented with primary infertility.

Table II. *Duration of infertility*

Duration	Frequency	Percent	
2 - < 5 years	51	40.2	Mean ± SD
5 - 10 years	66	52.0	6.14±2.7
> 10 years	10	7.9	
Total	127	100.0	

Table II shows that among 127 cases mean duration of infertility was 6 years with SD ± 2.7 years, and majority (52%) of cases presented within 5 to 10years of infertility.

Table III. *Association of endometriosis with type of infertility (n=24)*

Endometriosis	Type of infertility		P value
	Primary	Secondary	
Yes	95.80%	4.20%	0.004
No	67.00%	33.00%	

Table III shows that among the respondents with endometriosis, 95.8% suffered from primary infertility and only 4.2% from secondary infertility. Statistically significant association was found between endometriosis and primary infertility (p=0.004)

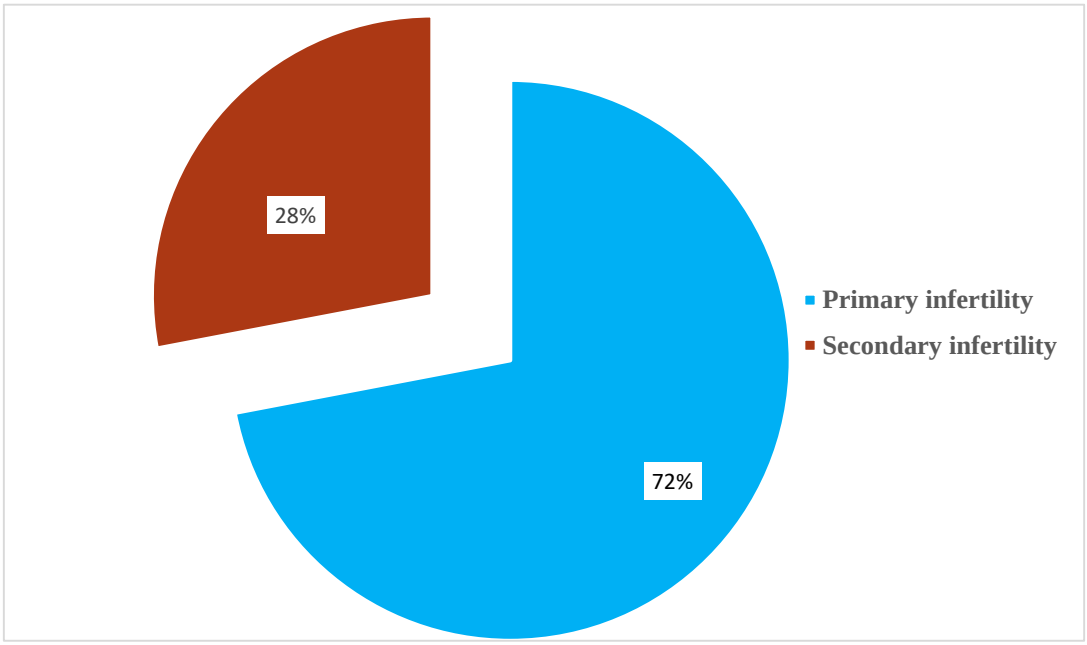

Figure 1. *Type of infertility*

Figure 1 shows that 72% patients had primary infertility and the rest (28%) suffered from secondary infertility.

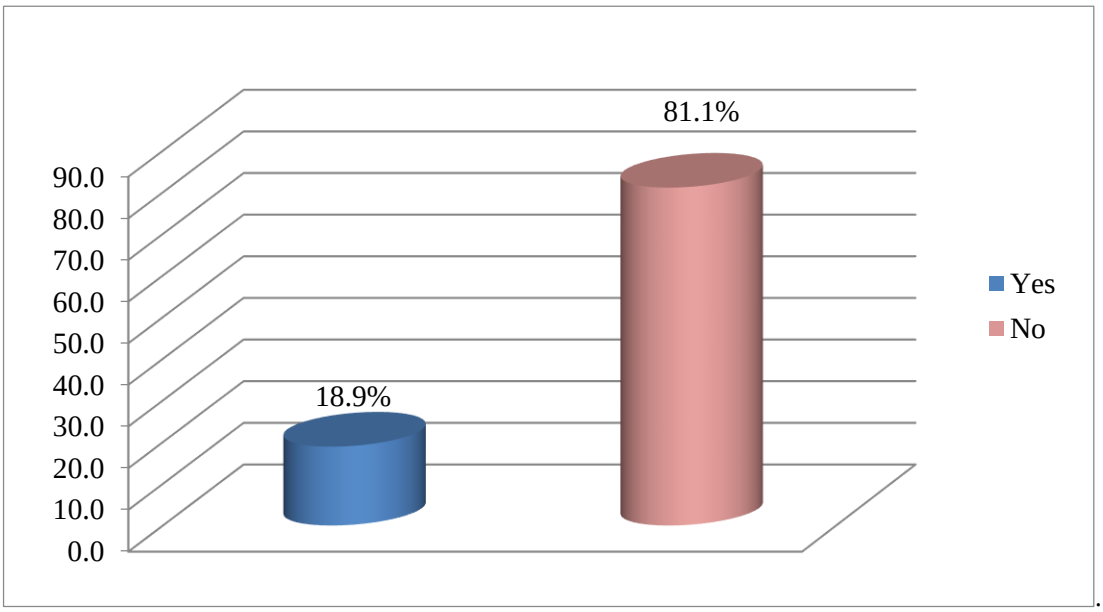

Figure 2. *Frequency of endometriosis among the respondents based on laparoscopic evidence (n=127)*

Figure 2 shows the frequency of endometriosis among the respondents. Of these, 24 (18.9%) women had endometriosis based on laparoscopic evidence.

4. Discussion

This study explored the baseline characteristics of infertile women undergoing laparoscopic evaluation, with a particular focus on the prevalence of endometriosis and its association with the type of infertility. The mean age of respondents was 29.31 ± 4.08 years, consistent with the reproductive age group typically affected by infertility, as shown in previous Bangladeshi studies [13, 14]. Body mass index (BMI) distribution in our study indicated that a majority of women were either of normal weight (36.22%) or overweight (34.65%), while 24.41% were obese. These findings are comparable to other local studies that have also observed high prevalence of abnormal BMI among infertile women from Anwary et al [13]. Obesity has been

suggested to influence ovulatory function and endometrial receptivity, thus affecting fertility.

In terms of infertility type, our results show that 71.65% of the participants experienced secondary infertility, whereas 28.35% had primary infertility. This is consistent with the findings of Sultana et al., who reported a higher incidence of secondary infertility in the Bangladeshi population [15]. However, among the 24 women diagnosed with endometriosis via laparoscopy, a striking 95.8% had primary infertility, with only 4.2% having secondary infertility. The association between endometriosis and primary infertility was statistically significant ($p = 0.004$), suggesting a strong relationship between the presence of endometriosis and impaired conception in women who have never conceived.

Our findings support the conclusion of Thakral et al., who observed a high incidence of endometriosis in women presenting with primary infertility [16]. Furthermore, Sharfuddin et al., emphasized that endometriosis often remains asymptomatic or is underdiagnosed until laparoscopic evaluation is performed, highlighting the importance of minimally invasive diagnostic tools [17].

The prevalence of endometriosis in our study population was 18.9%, which aligns with reports from similar South Asian studies where rates ranged from 15–25% among infertile women [18, 19]. Globally, the prevalence of endometriosis among infertile women varies between 20–50% depending on diagnostic criteria and population characteristics [20, 21]. The diagnostic use of laparoscopy, as applied in our study, remains the gold standard, especially in patients with unexplained infertility or chronic pelvic pain [22].

The mean duration of infertility in our study was 6.14 ± 2.7 years, with more than half of the women suffering for 5–10 years before seeking care. This delay may be attributed to a lack of awareness, social stigma, or limited access to specialized fertility services. Similar prolonged durations were reported by Aziz et al., emphasizing the need for early diagnostic laparoscopy in suspected endometriosis cases [23].

The high proportion of primary infertility among endometriosis patients in this study highlights the pathophysiological mechanisms through which endometriosis may impair fertility—such as altered pelvic anatomy, inflammation, and disrupted ovulatory function [24, 25]. Moreover, endometriosis-associated infertility may be compounded by comorbid conditions like adenomyosis, which has also been shown to negatively affect implantation and pregnancy rates [26].

Laparoscopy not only confirms the diagnosis but can also facilitate immediate treatment through lesion ablation or adhesiolysis. As supported by Surrey et al., surgical intervention during diagnostic laparoscopy may enhance fertility outcomes, particularly in early-stage endometriosis [27]. Bhandari et al., also emphasized that laparoscopic findings can guide targeted interventions in otherwise unexplained infertility cases [28].

While endometriosis remains a significant contributor to infertility, it is often overlooked in routine gynecological evaluations. Our findings reinforce the utility of early laparoscopic evaluation in women with primary infertility, especially when other causes are not evident. This aligns with the recommendations by Tissot et al., who advocate for increased awareness and diagnostic vigilance for endometriosis during interval laparoscopic procedures [29].

5. Limitations of the Study

This study was limited by its cross-sectional design, which prevents establishing causal relationships between endometriosis and infertility. The use of convenient sampling may introduce selection bias, limiting generalizability. Additionally, the study was conducted at a single center, which may not reflect the broader population.

6. Conclusion

In conclusion, our study demonstrates a significant association between endometriosis and primary infertility, with laparoscopy serving as a crucial tool for both diagnosis and therapeutic management. Early detection and intervention in endometriosis may improve fertility outcomes and reduce the long-term psychological burden of infertility. Further research with larger cohorts and long-term follow-up is warranted to assess the impact of surgical treatment on conception rates.

Financial Support and Sponsorship

No funding sources.

Conflicts of Interest

There are no conflicts of interest.

REFERENCES

[1]. Zhao R, Feng D, Zhuang G, Liu Y, Chi S, Zhang J, Zhou X, Zhang W, Wang H. Protein kinase CK2 participates in estrogen-mediated endothelial progenitor cell homing to endometriotic lesions through stromal cells in a stromal cell–derived factor-1–CXCR4-dependent manner. Fertility and Sterility. 2020 May 1; 113(5):1067-79.

[2]. Kennedy S, Bergqvist A, Chapron C, D'Hooghe T, Dunselman G, Greb R, Hummelshoj L, Prentice A, Saridogan E. ESHRE guideline for the diagnosis and treatment of endometriosis. Human reproduction. 2005 Oct 1; 20(10):2698-704.

[3]. Dunselman GA, Vermeulen N, Becker C, Calhaz-Jorge C, D'Hooghe T, De Bie B, Heikinheimo O, Horne AW, Kiesel L, Nap A, Prentice A. ESHRE guideline: management of women with endometriosis. Human reproduction. 2014 Mar 1; 29(3):400-12.

[4]. Atkinson A. Alan Geoffrey Atkinson. BMJ: British Medical Journal (Online). 2009 Jun 12; 338.

[5]. Baker VL, Luke B, Brown MB, Alvero R, Frattarelli JL, Usadi R, Grainger DA, Armstrong AY. Multivariate analysis of factors affecting probability of pregnancy and live birth with in vitro fertilization: an analysis of the Society for Assisted Reproductive Technology Clinic Outcomes Reporting System. Fertility and sterility. 2010 Sep 1; 94(4):1410-6.

[6]. Verberg MF, Gillott DJ, Al-Fardan N, Grudzinskas JG. Hyperemesis gravidarum, a literature review. Human reproduction update. 2005 Sep; 11(5):527-39.

[7]. Islam F, Hossain S, Afzal MN, Haider R, Akhter K, Akhter R. The Impact of Laparoscopic Treatment on Fertility Outcomes in Patients with Severe Endometriosis. Saudi J Med. 2024;9(11):480-5.

[8]. Aldubayan K, Aljuraiban G, Aldisi D. Necessary knowledge and skills for dietitians in Saudi Arabia: a qualitative study. The Malaysian journal of medical sciences: MJMS. 2019 Jun 28; 26(3):110.

[9]. Mahtab NT, Mahmud N, Chowdhury TS, Chowdhury TA, Begum T. A follow-up study on fertility and menstrual pattern in infertile patients after laparoscopy in a tertiary care hospital in Bangladesh. BIRDEM Medical Journal. 2020 Jun 23; 10(2):125-9.

[10]. Sultana S, Chowdhury TA, Chowdhury TS, Mahmud N, Sultana R, Mahtab NT, Sharker Y, Ahmed F. Migraine among women with endometriosis: a hospital-based case-control study in Bangladesh. AJOG Global Reports. 2024 May 1; 4(2):100344.

[11]. Haque SS. Laparoscopic evaluation of bilateral tubal occlusion for management of infertility in Dhaka. Glob J Med Res. 2018; 8:30.

[12]. Siddiqui M, Ghafoor N, Abdullah RS, Naznine F, Chowdhury TA. Unexplained Infertility with Normal Hysterosalpingography Report: Is Laparoscopy the Next Rational Step?. Bangladesh J. 2021 Jan; 1(2):80-3.

[13]. Anwary SA, Mondal MN, Karim MR, Rahman MM, Alfazzaman M, Mahzabin Z, Rahman MM, Nahar A. Determinants of Infertility among Married Couples in a Tertiary Hospital in Bangladesh. Scholars International Journal of Obstetrics and Gynecology. 2023; 6(1):47-53.

[14]. e Zakaria R, Dewan F, Susan ZS, Ghani A. Diagnostic and therapeutic role of laparoscopy in the Current Fertility Practice. Journal of Shaheed Suhrawardy Medical College. 2015; 7(2):73-5.

[15]. Sultana A, Tanira S, Adhikary S, Keya KA, Akhter S. Explained infertility among the couple attending the infertility unit of Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh. Journal of Dhaka Medical College. 2014; 23(1):114-20.

[16]. Thakral V, Garg S, Suren P. Evaluation of Endometriosis in Infertility: Incidence, Clinical Features, and Laparoscopic Findings. Journal of Mahatma Gandhi University of Medical Sciences and Technology. 2020 Dec 1; 5(3):73-6.

[17]. Sharfuddin S, Imam N, Pradhan A. Laparoscopic evaluation and prevalence of endometriosis among infertile women: a prospective study. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2020 May 1; 9(5):1914-9.

[18]. Khan JH, Rahman S, Nasreen CT, Alam J, Fatema P. Risk profiles associated with endometriosis among infertile women. Bangladesh Journal of Obstetrics & Gynaecology. 2018; 33(2):131-9.

[19]. El-flahgy MM, El-Bassioune WM, Ayad WA. Incidence of endometriosis among women prepared for laparoscopy in unexplained infertility and chronic pelvic pain. International Journal of Medical Arts. 2020 Jul 1;2(3):519-27.

[20]. Prescott J, Farland LV, Tobias DK, Gaskins AJ, Spiegelman D, Chavarro JE, Rich-Edwards JW, Barbieri RL, Missmer SA. A prospective cohort study of endometriosis and subsequent risk of infertility. Human Reproduction. 2016 Jul 1; 31(7):1475-82.

[21]. Bulletti C, Coccia ME, Battistoni S, Borini A. Endometriosis and infertility. Journal of assisted reproduction and genetics. 2010 Aug; 27:441-7.

[22]. Wanyonyi SZ, Sequeira E, Mukono SG. Correlation between laparoscopic and histopathologic diagnosis of endometriosis. International Journal of Gynecology & Obstetrics. 2011 Dec 1; 115(3):273-6.

[23]. Aziz N. Laparoscopic evaluation of female factors in infertility. J Coll Physicians Surg Pak. 2010 Oct 1; 20(10):649-52.

[24]. Ashrafi M, Sadatmahalleh SJ, Akhoond MR, Talebi M. Evaluation of risk factors associated with endometriosis in infertile women. International journal of fertility & sterility. 2016 Apr 5; 10(1):11.

[25]. McGuinness B, Nezhat F, Ursillo L, Akerman M, Vintzileos W, White M. Fallopian tube endometriosis in women undergoing operative video laparoscopy and its clinical implications. Fertility and Sterility. 2020 Nov 1; 114(5):1040-8.

[26]. Eisenberg VH, Arbib N, Schiff E, Goldenberg M, Seidman DS, Soriano D. Sonographic signs of adenomyosis are prevalent in women undergoing surgery for endometriosis and may suggest a higher risk of infertility. BioMed research international. 2017; 2017(1):8967803.

[27]. Surrey ES, Soliman AM, Yang H, Du EX, Su B. Treatment patterns, complications, and health care utilization among endometriosis patients undergoing a laparoscopy or a hysterectomy: a retrospective claims analysis. Advances in Therapy. 2017 Nov; 34:2436-51.

[28]. Bhandari S, Singh A, Agrawal P, Ganguli I. Findings in diagnostic laparoscopy in patients with unexplained infertility. Fertility Science and Research. 2015 Jan 1; 2(1):29-33.

[29]. Tissot M, Lecointre L, Faller E, Afors K, Akladios C, Audebert A. Clinical presentation of endometriosis identified at interval laparoscopic tubal sterilization: Prospective series of 465 cases. Journal of gynecology obstetrics and human reproduction. 2017 Oct 1; 46(8):647-50.

Citation: *Dr. Sayeeda Pervin et al. Clinical Pattern of Infertility and its Association with Laparoscopic Evidence of Endometriosis. ARC Journal of Gynecology and Obstetrics. 2025; 9(1):26-32. DOI: https://doi.org/10.20431/2456-0561.0901005.*