

Original Research Article

DIAGNOSTIC DELAY IN ENDOMETRIOSIS AND ITS EFFECT ON REPRODUCTIVE OUTCOMES

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ABSTRACT

Background: Endometriosis is a chronic gynecological disorder affecting approximately 10% of women of reproductive age and is a major cause of infertility. Delayed diagnosis remains a significant challenge due to the nonspecific nature of symptoms and limited awareness, potentially leading to disease progression and adverse reproductive outcomes. **Aim:** To evaluate the effect of diagnostic delay in endometriosis on reproductive outcomes among women attending gynecology and infertility clinics.

Materials and Methods: This observational study was conducted in the Department of Obstetrics and Gynecology, Sree Venkateshwaraa Medical College and Research Institute, Redhills, Chennai, from March 2025 to February 2026. A total of 100 women aged 20–40 years with confirmed endometriosis were included. Data regarding age, age at symptom onset, age at diagnosis, diagnostic delay, stage of endometriosis, infertility status, IVF requirement, pregnancy outcomes, and live birth outcomes were collected from medical records. Statistical analysis was performed using SPSS version 26.0, with a p-value <0.05 considered statistically significant.

Results: The mean age of participants was 31.8 ± 5.4 years. The mean age at symptom onset and diagnosis were 24.2 ± 4.6 years and 29.8 ± 5.1 years, respectively, resulting in a mean diagnostic delay of 5.6 ± 2.8 years. Infertility was observed in 62% of women, while 35% required IVF. Patients with diagnostic delays exceeding 7 years had significantly higher infertility rates (83.3%), greater IVF utilization (50.0%), lower pregnancy rates (40.0%), and reduced live birth rates (30.0%) compared to those diagnosed within 3 years ($p < 0.05$).

Conclusion: Prolonged diagnostic delay in endometriosis is associated with poorer reproductive outcomes. Early diagnosis and timely intervention may improve fertility potential and live birth rates.

Keywords: Endometriosis, Diagnostic Delay, Infertility, IVF, Reproductive Outcomes, Live Birth.

INTRODUCTION

Endometriosis is a chronic, estrogen-dependent inflammatory disorder characterized by the presence of endometrial-like glands and stroma outside the uterine cavity. It is one of the most common gynecological conditions affecting women of reproductive age, with an estimated prevalence of approximately 10% in the general female population and up to 50% among women presenting with infertility.^[1,3] The condition commonly involves the ovaries, pelvic peritoneum, uterosacral ligaments,

and rectovaginal septum, although extra-pelvic manifestations have also been reported.^[1,6] Endometriosis is associated with a wide spectrum of symptoms, including dysmenorrhea, chronic pelvic pain, dyspareunia, dyschezia, and infertility, significantly impairing quality of life and reproductive health.^[5,12]

Despite its high prevalence and considerable impact on physical, psychological, and social well-being, endometriosis remains substantially underdiagnosed worldwide.^[1,2] The diagnosis is often delayed because the symptoms are frequently nonspecific

and may overlap with those of other gynecological, gastrointestinal, or urinary tract disorders.^[4,9] Furthermore, menstrual pain is often normalized by patients, family members, and healthcare providers, leading to underrecognition of the disease.^[5,11] Historically, definitive diagnosis required laparoscopic visualization with or without histopathological confirmation, contributing further to diagnostic delays.^[6,13] Studies conducted in various countries have reported an average diagnostic delay ranging from 4 to 11 years from the onset of symptoms to confirmed diagnosis.^[2,5,9]

Delayed diagnosis can have significant clinical consequences. During the period of undiagnosed disease, endometriotic lesions may continue to progress, resulting in chronic inflammation, fibrosis, pelvic adhesions, ovarian endometriomas, and distortion of pelvic anatomy.^[7,8] These pathological changes may adversely affect reproductive function through multiple mechanisms, including impaired ovulation, altered tubal transport, reduced ovarian reserve, compromised fertilization, and defective embryo implantation.^[7,10] Consequently, endometriosis is recognized as one of the leading causes of female infertility.^[1,3]

The relationship between endometriosis and infertility is complex and multifactorial. Approximately 30–50% of women with endometriosis experience difficulty conceiving.^[1,6] In advanced stages of the disease, extensive pelvic adhesions and anatomical distortion can directly impair fertility, while even minimal or mild disease may negatively influence reproductive outcomes through inflammatory and immunological mechanisms.^[8,13] Chronic pelvic inflammation has been shown to alter the peritoneal environment, affect oocyte quality, impair sperm function, and reduce endometrial receptivity, thereby decreasing the likelihood of successful conception and pregnancy.^[7,10]

In addition to infertility, delayed diagnosis may influence other important reproductive outcomes. Women diagnosed late often require assisted reproductive technologies such as in vitro fertilization (IVF) to achieve pregnancy.^[3,15] Several studies have suggested that prolonged disease duration and advanced-stage endometriosis are associated with lower spontaneous pregnancy rates, increased dependence on fertility treatments, and reduced live birth rates.^[11,15] Furthermore, endometriosis has been linked to adverse obstetric outcomes, including miscarriage, preterm birth, placenta previa, and hypertensive disorders of pregnancy.^[14,16]

Early diagnosis and timely intervention may help preserve fertility potential by preventing disease progression and facilitating appropriate medical or surgical management.^[2,3] Increased awareness among healthcare providers and patients, along with advances in imaging techniques such as transvaginal ultrasonography and magnetic resonance imaging, have improved the noninvasive detection of

endometriosis.^[2,18] Nevertheless, diagnostic delay remains a major challenge in clinical practice, particularly in developing countries where awareness and access to specialized care may be limited.^[4,9]

Although several international studies have investigated the impact of diagnostic delay on fertility, there is limited evidence from the Indian population regarding its effect on reproductive outcomes.^[3,11,19] Understanding this relationship is essential for developing strategies aimed at earlier diagnosis and improved fertility preservation. Therefore, the present study was undertaken to evaluate the association between diagnostic delay in endometriosis and reproductive outcomes, including infertility, requirement for IVF, pregnancy achievement, and live birth rates among women attending gynecology and infertility clinics at a tertiary care teaching hospital.^[2,3,20]

Objectives

Primary Objective

- To assess the effect of diagnostic delay in endometriosis on reproductive outcomes among women of reproductive age.

Secondary Objectives

1. To determine the duration of diagnostic delay among women diagnosed with endometriosis.
2. To evaluate the association between diagnostic delay and infertility.
3. To assess the relationship between diagnostic delay and the requirement for in vitro fertilization (IVF).
4. To evaluate the impact of diagnostic delay on pregnancy achievement and live birth outcomes.
5. To determine the association between the stage of endometriosis and reproductive outcomes.
6. To identify whether prolonged diagnostic delay is associated with poorer fertility outcomes in women with endometriosis.

MATERIALS AND METHODS

Study Design

This observational study was conducted to evaluate the impact of diagnostic delay in endometriosis on reproductive outcomes among women attending gynecology and infertility clinics.

Study Setting

The study was carried out in the Department of Obstetrics and Gynecology, Sree Venkateshwarraa Medical College and Research Institute, Redhills, Chennai, Tamil Nadu, India.

Study Duration

The study was conducted over a period of one year from March 2025 to February 2026.

Study Population

Women diagnosed with endometriosis who attended the Gynecology and Infertility Clinics during the study period were included in the study.

Sample Size

A total of 100 women with confirmed endometriosis were included in the study.

Inclusion Criteria

1. Women aged between 20 and 40 years.
2. Women with a confirmed diagnosis of endometriosis based on clinical, imaging, laparoscopic, or histopathological findings.
3. Women attending the Gynecology and Infertility Clinics during the study period (March 2025–February 2026).
4. Women with complete medical records containing details of symptom onset, diagnosis, stage of endometriosis, infertility status, IVF requirement, and pregnancy/live birth outcomes.

Exclusion Criteria

1. Women with infertility solely due to male-factor causes.
2. Women with congenital uterine anomalies or other significant reproductive tract abnormalities.

Variable Measurement

Variable	Type of Variable	Scale
Age	Independent	Continuous
Age at symptom onset	Independent	Continuous
Age at diagnosis	Independent	Continuous
Diagnostic delay	Independent	Continuous/Categorical
Stage of endometriosis	Independent	Ordinal
Infertility status	Outcome	Categorical (Binary)
IVF requirement	Outcome	Categorical (Binary)
Pregnancy outcome	Outcome	Categorical (Binary)
Live birth outcome	Outcome	Categorical (Binary)

Diagnostic Delay

Diagnostic delay was defined as the time interval between the onset of endometriosis-related symptoms and the establishment of a confirmed diagnosis. It was calculated as:

Diagnostic Delay (years) = Age at Diagnosis – Age at Symptom Onset

For analysis, diagnostic delay was categorized as:

- Short delay: ≤ 3 years
- Moderate delay: 4–7 years
- Long delay: > 7 years

Endometriosis

Endometriosis was defined as the presence of endometrial-like tissue outside the uterine cavity, confirmed by clinical evaluation, imaging studies, laparoscopic findings, or histopathological examination.

Stage of Endometriosis

Disease severity was classified according to the revised American Society for Reproductive Medicine (rASRM) classification as:

- Stage I (Minimal)
- Stage II (Mild)
- Stage III (Moderate)
- Stage IV (Severe)

Infertility

3. Women who had undergone hysterectomy or bilateral oophorectomy.
4. Women with incomplete or missing medical records relevant to the study variables.

VARIABLES STUDIED

The following variables were collected from the medical records of women diagnosed with endometriosis:

Independent Variables

- Age (years)
- Age at symptom onset (years)
- Age at diagnosis (years)
- Diagnostic delay (years)
- Stage of endometriosis (Stage I–IV)

Outcome Variables

- Infertility status (Yes/No)
- Requirement for in vitro fertilization (IVF) (Yes/No)
- Pregnancy outcome (Pregnant/Not pregnant)
- Live birth outcome (Yes/No)

Infertility was defined as the failure to achieve pregnancy after at least 12 months of regular unprotected sexual intercourse.

IVF Requirement

IVF requirement was defined as the utilization of in vitro fertilization as part of assisted reproductive treatment to achieve conception.

Pregnancy Outcome

Pregnancy outcome was defined as the occurrence of a clinically confirmed intrauterine pregnancy documented by ultrasonography.

Live Birth Outcome

Live birth outcome was defined as the delivery of a live-born infant after fetal viability.

Reproductive Outcome

Reproductive outcome referred to fertility-related outcomes assessed in the study, including infertility status, IVF requirement, pregnancy achievement, and live birth.

Data Collection

Data were collected from the medical records of women diagnosed with endometriosis who attended the Gynecology and Infertility Clinics at Sree Venkateshwaraa Medical College and Research Institute, Redhills, Chennai, between March 2025 and February 2026. Eligible patient records were identified based on the predefined inclusion and exclusion criteria. Relevant information was

extracted using a structured data collection proforma.

The collected data included age, age at symptom onset, age at diagnosis, diagnostic delay, stage of endometriosis, infertility status, requirement for in vitro fertilization (IVF), pregnancy outcome, and live birth outcome. Diagnostic delay was calculated as the interval between symptom onset and confirmed diagnosis. All data were anonymized prior to analysis to maintain patient confidentiality, and records with incomplete information were excluded from the study.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee of Sree Venkateshwaraa Medical College and Research Institute, Redhills, Chennai, prior to the commencement of the study. As this was a record-based study, informed consent was waived by the Ethics Committee. Patient confidentiality and anonymity were strictly maintained throughout the study by de-identifying all patient records and using the collected data solely for research purposes. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

Statistical Analysis

The collected data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0. Continuous

variables such as age, age at symptom onset, age at diagnosis, and diagnostic delay were expressed as mean \pm standard deviation (SD), while categorical variables including stage of endometriosis, infertility status, IVF requirement, pregnancy outcome, and live birth outcome were presented as frequencies and percentages. Associations between diagnostic delay, stage of endometriosis, and reproductive outcomes were assessed using the Chi-square test or Fisher's exact test, as appropriate, while comparisons of continuous variables were performed using Student's t-test or one-way Analysis of Variance (ANOVA). A p-value of less than 0.05 was considered statistically significant.

RESULTS

Baseline Characteristics of the Study Participants

A total of 100 women with confirmed endometriosis were included in the study. The mean age of the participants was 31.8 ± 5.4 years. The mean age at symptom onset was 24.2 ± 4.6 years, while the mean age at diagnosis was 29.8 ± 5.1 years. The average diagnostic delay was 5.6 ± 2.8 years. Most patients were diagnosed with advanced-stage disease, with Stage III and Stage IV endometriosis accounting for 58% of the study population.

Table 1: Baseline Characteristics of the Study Participants (n = 100)

Characteristic	Value
Age (years), Mean \pm SD	31.8 ± 5.4
Age at Symptom Onset (years), Mean \pm SD	24.2 ± 4.6
Age at Diagnosis (years), Mean \pm SD	29.8 ± 5.1
Diagnostic Delay (years), Mean \pm SD	5.6 ± 2.8
Stage I Endometriosis, n (%)	18 (18.0)
Stage II Endometriosis, n (%)	24 (24.0)
Stage III Endometriosis, n (%)	32 (32.0)
Stage IV Endometriosis, n (%)	26 (26.0)

Note: Data are presented as mean \pm standard deviation (SD) for continuous variables and frequency (n) with percentage (%) for categorical variables. Diagnostic delay was calculated as the interval between age at symptom onset and age at diagnosis. Endometriosis staging was based on the revised American Society for Reproductive Medicine (rASRM) classification.

Distribution of Endometriosis According to Stage

The severity of endometriosis was assessed using the revised American Society for Reproductive Medicine (rASRM) classification. Stage III endometriosis was the most common presentation, accounting for 32% of cases, followed by Stage IV (26%), Stage II (24%), and Stage I (18%). More than half of the study participants (58%) were diagnosed with moderate-to-severe disease (Stage III and IV), indicating that many women presented with advanced disease at the time of diagnosis.

Table 2: Distribution of Endometriosis According to Stage (n = 100)

Stage of Endometriosis	Frequency (n)	Percentage (%)
Stage I (Minimal)	18	18.0
Stage II (Mild)	24	24.0
Stage III (Moderate)	32	32.0
Stage IV (Severe)	26	26.0
Total	100	100.0

Note: Endometriosis staging was classified according to the revised American Society for Reproductive Medicine (rASRM) classification.

Stage I and II represent minimal-to-mild disease, whereas Stage III and IV represent moderate-to-severe disease.

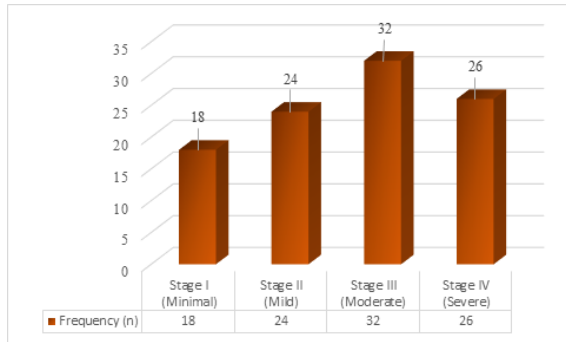


Figure 1: Distribution of Endometriosis According to Stage Among the Study Participants (n = 100)

Note: Endometriosis staging was classified according to the revised American Society for Reproductive Medicine (rASRM) classification.

Stage I represents minimal disease, Stage II mild disease, Stage III moderate disease, and Stage IV severe disease. Values are expressed as frequencies and percentages. The majority of participants were diagnosed with Stage III (32%) and Stage IV (26%) endometriosis, indicating a higher prevalence of moderate-to-severe disease at the time of diagnosis.

Reproductive Outcomes Among Women with Endometriosis

Among the 100 women included in the study, infertility was observed in 62% of participants, highlighting the substantial impact of endometriosis on reproductive function. Thirty-five percent of women required in vitro fertilization (IVF) to achieve conception, reflecting the increased need for assisted reproductive techniques in this population. Clinical pregnancy was achieved in 58% of patients, while 48% ultimately had a live birth.

Table 3: Reproductive Outcomes Among Women with Endometriosis (n = 100)

Reproductive Outcome	Frequency (n)	Percentage (%)
Infertility	62	62.0
IVF Requirement	35	35.0
Pregnancy Achieved	58	58.0
Live Birth	48	48.0

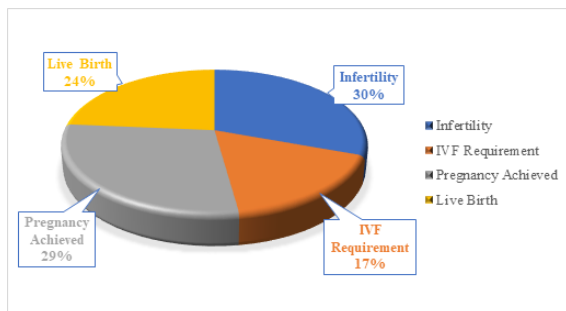


Figure 2: Reproductive Outcomes Among Women with Endometriosis (n = 100)

Figure Note: Values are expressed as percentages of the total study population. Infertility was the most common reproductive outcome observed, followed by pregnancy achievement, live birth, and IVF requirement.

Chi-square test = 12.84; p = 0.005

Interpretation: A high proportion of women with endometriosis experienced infertility and required assisted reproductive techniques. Although pregnancy was achieved in more than half of the participants, the live birth rate remained comparatively lower. The observed reproductive

outcomes indicate a significant negative impact of endometriosis on fertility and reproductive success.

Note: Values are expressed as frequency (n) and percentage (%). Pregnancy outcome refers to clinically confirmed intrauterine pregnancy, while live birth outcome refers to the delivery of a live-born infant after fetal viability.

Association Between Diagnostic Delay and Reproductive Outcomes

Women were categorized into three groups based on the duration of diagnostic delay: ≤ 3 years, 4–7 years, and >7 years. A significant association was observed between diagnostic delay and reproductive outcomes. As the duration of diagnostic delay increased, the prevalence of infertility and the requirement for IVF increased, whereas pregnancy achievement and live birth rates decreased. Women with a diagnostic delay of more than 7 years had the highest infertility rate (83.3%) and IVF requirement (50.0%), along with the lowest pregnancy (40.0%) and live birth rates (30.0%). These findings indicate that prolonged diagnostic delay is associated with poorer reproductive outcomes among women with endometriosis.

Table 4: Association Between Diagnostic Delay and Reproductive Outcomes

Diagnostic Delay	Infertility n (%)	IVF Requirement n (%)	Pregnancy Achieved n (%)	Live Birth n (%)
≤ 3 years (n=30)	12 (40.0)	6 (20.0)	22 (73.3)	20 (66.7)
4–7 years (n=40)	25 (62.5)	14 (35.0)	24 (60.0)	19 (47.5)
>7 years (n=30)	25 (83.3)	15 (50.0)	12 (40.0)	9 (30.0)
p-value	<0.001	0.012	0.008	0.004

Interpretation: A statistically significant association was observed between diagnostic delay

and reproductive outcomes. Women experiencing longer delays in diagnosis were more likely to have

infertility and require IVF, while their chances of achieving pregnancy and live birth were significantly lower compared to women diagnosed earlier.

Note: Values are presented as frequency (n) and percentage (%). Statistical significance was determined using the Chi-square test. A p-value of <0.05 was considered statistically significant.

Association Between Stage of Endometriosis and Reproductive Outcomes

A significant association was observed between the stage of endometriosis and reproductive outcomes.

Women with advanced-stage disease (Stage III and Stage IV) demonstrated higher rates of infertility and greater utilization of IVF compared to those with Stage I and Stage II disease. Conversely, pregnancy achievement and live birth rates decreased progressively with increasing disease severity. The highest infertility rate was observed among women with Stage IV endometriosis (84.6%), while the highest live birth rate was observed among those with Stage I disease (72.2%).

Table 5: Association Between Stage of Endometriosis and Reproductive Outcomes

Stage of Endometriosis	Infertility n (%)	IVF Requirement n (%)	Live Birth n (%)
Stage I (n=18)	5 (27.8)	2 (11.1)	13 (72.2)
Stage II (n=24)	11 (45.8)	5 (20.8)	14 (58.3)
Stage III (n=32)	22 (68.8)	13 (40.6)	14 (43.8)
Stage IV (n=26)	22 (84.6)	15 (57.7)	7 (26.9)
p-value	<0.001	0.002	0.001

Interpretation: The severity of endometriosis was significantly associated with reproductive outcomes. Women with Stage III and Stage IV disease had a higher likelihood of infertility and IVF requirement, whereas live birth rates were significantly lower compared with women having Stage I and Stage II disease.

Note: Values are presented as frequency (n) and percentage (%). Endometriosis staging was based on the revised American Society for Reproductive Medicine (rASRM) classification. Statistical significance was assessed using the Chi-square test, with a p-value <0.05 considered statistically significant.

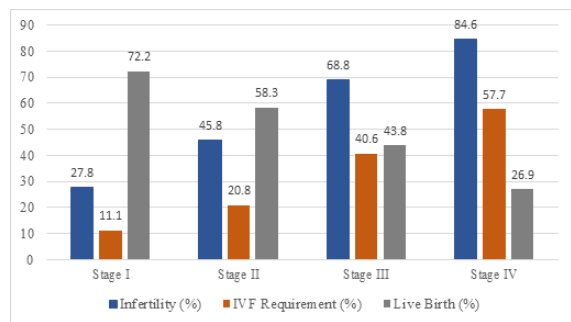


Figure 3: Association Between Stage of Endometriosis and Reproductive Outcomes

Note: Values are expressed as percentages. Infertility and IVF requirement increased progressively with advancing stages of endometriosis, whereas live birth rates decreased with increasing disease severity. A statistically significant association was observed between the stage of endometriosis and reproductive outcomes ($p < 0.05$).

DISCUSSION

The present observational study evaluated the impact of diagnostic delay in endometriosis on

reproductive outcomes among women attending gynecology and infertility clinics. The findings demonstrated that prolonged diagnostic delay was significantly associated with adverse reproductive outcomes, including higher rates of infertility, increased requirement for in vitro fertilization (IVF), lower pregnancy rates, and reduced live birth rates. Furthermore, advanced-stage endometriosis was found to be significantly associated with poorer reproductive outcomes when compared with early-stage disease.^[1-4]

In the present study, the mean age of the participants was 31.8 ± 5.4 years, which is comparable to previous studies reporting that endometriosis predominantly affects women during their reproductive years.^[1,3] The mean age at symptom onset was 24.2 ± 4.6 years, whereas the mean age at diagnosis was 29.8 ± 5.1 years, resulting in an average diagnostic delay of 5.6 ± 2.8 years. This finding is consistent with earlier reports that have documented diagnostic delays ranging from 4 to 11 years worldwide.^[2,5,9] Such delays may occur due to the normalization of menstrual pain, nonspecific symptom presentation, lack of awareness among patients and healthcare providers, and challenges associated with establishing a definitive diagnosis.^[4,9,10]

A notable finding of the present study was that 62% of women experienced infertility. This observation is consistent with previous literature reporting infertility among 30–50% of women with endometriosis.^[1,6,7] The high prevalence of infertility observed in this study may be attributed to chronic pelvic inflammation, altered pelvic anatomy, ovarian dysfunction, impaired tubal transport, and reduced endometrial receptivity associated with endometriosis.^[7,8,10] These mechanisms can adversely affect fertilization, implantation, and overall reproductive success.^[8,13]

The association between diagnostic delay and infertility was particularly significant. Women with

a diagnostic delay exceeding 7 years exhibited markedly higher infertility rates compared with those diagnosed within 3 years of symptom onset. Similar findings have been reported in previous studies, suggesting that prolonged exposure to endometriosis-related inflammation and progressive pelvic damage may contribute to declining fertility potential over time.^[3,5,11] Delayed diagnosis may also postpone appropriate medical or surgical intervention, thereby reducing opportunities for fertility preservation.^[2,12]

The present study also demonstrated that the requirement for IVF increased significantly with longer diagnostic delays. Half of the women with delays greater than 7 years required IVF for conception, compared with only one-fifth of women diagnosed within 3 years. This finding underscores the importance of early detection and management of endometriosis to optimize natural fertility and reduce dependence on assisted reproductive technologies.^[2,3] Early intervention may help prevent disease progression and preserve ovarian reserve, thereby improving the likelihood of spontaneous conception.^[7,8,15]

Another important observation was the decline in pregnancy and live birth rates with increasing diagnostic delay. Women diagnosed earlier had significantly higher pregnancy and live birth rates compared with those experiencing prolonged delays. These findings support the hypothesis that progressive disease severity adversely affects reproductive outcomes through mechanisms such as pelvic adhesions, ovarian endometriomas, altered folliculogenesis, and impaired implantation.^[7,8,13] The reduced live birth rates observed among women with prolonged delays highlight the long-term reproductive consequences of late diagnosis.^[3,11,15]

The study further demonstrated a significant relationship between disease stage and reproductive outcomes. Women with Stage III and Stage IV endometriosis had higher infertility rates and greater IVF utilization, while live birth rates were substantially lower than those observed among women with Stage I and Stage II disease. These findings are in agreement with previous studies that have shown a progressive decline in fertility as disease severity increases.^[1,8,13] Advanced-stage endometriosis is frequently associated with extensive pelvic adhesions, anatomical distortion, and diminished ovarian reserve, all of which negatively impact reproductive function.^[7,10,14]

The findings of this study emphasize the need for increased awareness regarding endometriosis among both healthcare providers and women of reproductive age. Early recognition of symptoms such as dysmenorrhea, chronic pelvic pain, and infertility, coupled with timely referral and diagnostic evaluation, may help reduce diagnostic delays and improve reproductive outcomes.^[2,4,9] Advances in non-invasive diagnostic modalities, including transvaginal ultrasonography and magnetic resonance imaging, may facilitate earlier

diagnosis and initiation of appropriate treatment strategies.^[2,18]

The findings of the present study are supported by current international guidelines and recent literature emphasizing the importance of early diagnosis, fertility preservation, and multidisciplinary management in women with endometriosis.^[2,3,15,19,20]

Strengths of the Study

The present study evaluated multiple reproductive outcomes, including infertility, IVF requirement, pregnancy achievement, and live birth rates. It also assessed the impact of both diagnostic delay and disease severity on reproductive health, providing clinically relevant information for fertility counseling and patient management.

Limitations of the study

The study has several limitations. First, its design may be subject to information bias and reliance on the accuracy of medical records. Second, the study was conducted at a single tertiary care center, which may limit the generalizability of the findings. Third, the relatively small sample size may have reduced the power to detect smaller associations. Future multicenter prospective studies with larger sample sizes are warranted to validate these findings and further explore the mechanisms linking diagnostic delay to adverse reproductive outcomes.

Overall, the findings of the present study suggest that prolonged diagnostic delay and advanced-stage endometriosis are important predictors of poor reproductive outcomes. Early diagnosis and timely management may play a crucial role in preserving fertility and improving pregnancy and live birth outcomes among women affected by endometriosis.

CONCLUSION

The present study demonstrated that diagnostic delay in endometriosis is significantly associated with adverse reproductive outcomes. Women who experienced longer delays between symptom onset and diagnosis had higher rates of infertility, increased dependence on in vitro fertilization (IVF), lower pregnancy rates, and reduced live birth rates. Furthermore, advanced-stage endometriosis was associated with poorer reproductive outcomes when compared with early-stage disease.

The findings highlight the importance of early recognition of endometriosis-related symptoms and timely diagnostic evaluation to prevent disease progression and preserve reproductive potential. Improving awareness among healthcare providers and women of reproductive age, along with facilitating access to appropriate diagnostic and treatment services, may help reduce diagnostic delays and improve fertility outcomes. Early diagnosis and prompt intervention remain essential strategies for optimizing reproductive health and enhancing the quality of life of women affected by endometriosis.

Conflict of Interest

The authors declare no conflict of interest.

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