

Risk Factors for Endometriosis Among Egyptian Infertile Women with Different Disease Stages

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Azza Ibrahim Abd el-Kader¹ , Amina Saad Gonied²,
Mohamed Lotfy Mohamed³ and Sabah Lotfy Mohamed²

Abstract

Background: Endometriosis is regarded as a benign condition, despite the potential for recurrence and metastasis. It might lead to secondary ovarian cancer from endometrioma.

Objective: The aim of this current study was to determine the relationship between risk factors for endometriosis and disease stages.

Methods: This current cross-sectional study was performed at the endoscopic unit at Zagazig University Hospitals, Egypt. The participants included 85 women who were candidates for laparoscopy and diagnosed with endometriosis in the period from November 2019 to November 2020. The tools used for data collection were a structured interviewing form and the American Society of Reproductive Medicine scoring tool (ASRM) for determining stages of endometriosis.

Results: The high percentages of studied women were nulliparous (74.1%) and (51.8%) have secondary infertility. Endometriosis was staged as 20.0% minimal (ASRM stage I), 34.1% mild (ASRM stage II), 29.4% moderate (ASRM stage III), and 16.5% severe (ASRM stage IV). Congestive dysmenorrhea (78.8%), dyspareunia (77.6%), and secondary infertility (51.8%) were more reported symptoms in all stages of endometriosis.

Conclusion: This study concluded that women within reproductive age, nulliparity, lower body weight, urban residence, and past surgery of the pelvic were considered as risk factors in all disease stages.

Keywords

endometriosis, risk factors, infertility, Egyptian women

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Introduction

Endometriosis is a gynecological disorder that affects women of reproductive age and is defined by the development and growth of endometrial-like glands and stroma outside the uterine cavity and musculature, undergoes cyclic proliferation and breakdown in the same way that the endometrium does. Internal bleeding that cannot exit the body and stays on-site causes local inflammatory reactions that cause scar tissue formation and adhesions during the healing process (Klemmt & Powitz, 2018).

Because laparoscopy is regarded as the gold standard for confirming the diagnosis, the prevalence of endometriosis is underestimated. The condition affects about 10% of all women of reproductive age (Shafirir et al., 2018).

The most accepted theory is that of retrograde menstruation, according to which menstrual endometrial fragments migrate through the fallopian tubes to the peritoneal cavity, where they implant, proliferate, and invade the pelvic

peritoneum (Smolarz et al., 2021). Endometriotic implants have been found almost anywhere in the female body, but they occur more frequently in the pelvic cavity. The primary locations of endometriosis are in the pelvis: the ovaries, uterus, fallopian tubes, uterosacral ligaments, broad ligaments, round ligaments, cul-de-sac, rectosigmoid colon, bladder, ureters, and rectovaginal septum (Foti et al., 2018).

¹Department of Obstetrics and Gynecological Nursing, Faculty of Nursing, Zagazig University, Zagazig, Egypt

²Department of Obstetrics and Gynecological Department, Faculty of Nursing, Zagazig University, Zagazig, Egypt

³Department of Obstetrics and Gynecological Department, Faculty of Medicine, Zagazig University, Zagazig, Egypt

Corresponding Author:

Azza Ibrahim Abd el-Kader, Department of Obstetrics and Gynecological Nursing, Faculty of Nursing, Zagazig University, Egypt.
Email: dr_azza201087@yahoo.com



Early age at menarche, short menstrual cycle length, and profuse monthly bleeding, which represents the frequency of exposure to menstruation or the volume of menstrual reflux, have all been linked to an increased risk of endometriosis. Race, socioeconomic background, size, and weight are all risk factors for endometriosis. Endometriosis is more common in women who are taller and thinner. Furthermore, due to a putative relationship between impaired coagulation and immunological systems, women with naturally red hair may be at a higher risk of having endometriosis (Rossi, 2021).

Internal scarring, adhesions, chocolate cysts of the ovaries, and infertility are all possible complications of endometriosis. Adhesion was found to be present in 37.6% of endometriosis patients (Abd El-Kader et al., 2019). Urinary tract endometriosis, which causes endometriotic implants in the bladder, ureter, kidney, and urethra, is another consequence of this condition. The bladder and ureter are the most commonly affected parts of the body (Arion et al., 2019).

Currently, hormonal treatments are the most effective drugs for the treatment of endometriosis and are based on the pathogenic mechanisms involved in the disease. The goal is to stop cyclic menstruation in two ways: by blocking ovarian estrogen secretion or by causing a pseudo-pregnancy state. The endocrine background provides the rationale for the current and future hormonal drugs for treating women with endometriosis (Clemenza et al., 2018). This study aimed to determine the relationship between risk factors for endometriosis and disease stages in the trial to early detection and management and also to avoid probable complications.

Materials and Methods

Study Design

This current cross-sectional study was performed to determine the relationship between risk factors for endometriosis and disease stages. This study was conducted at Endoscopic Unit, in Zagazig University Hospital.

Participants

The study comprised a *purposive sample* of 85 women who were candidates for laparoscopy and diagnosed with endometriosis. These cases were enlisted among more than 636 cases admitted to the Endoscopic unit in the period of November 2019 to the end of November 2020 (one year). Women were eligible for recruitment in the study if they met the following criteria: married women with primary or secondary infertility, laparoscopy confirmation of endometriosis and also, women who have a desire to participate in this study. Women with pelvic inflammatory disease and fibroid or ovarian cyst had been rejected from the study and furthermore, prohibited the adolescent girl who undergoing laparoscopy and determined to have endometriosis.

Study Tool

The tool of data collection for this study was a structured interview form that was created by the researchers in order to collect the accompanying data: personal data (age, body mass index, and family history of endometriosis). Also, reproductive data were gathered from studied women, which include (parity, spontaneous abortion, type of infertility, and its duration). Participated women in this study were directed to answer the questions on their symptoms of endometriosis that lead to a diagnosis of the disease as dysmenorrhea, dyspareunia, infertility, and presence of constipation or diarrhea during menstruation.

Studied women were assessed for their risk factors for endometriosis age, residence, previous pelvic surgery positive, and family history for endometriosis. Endometriosis was classified into four stages: Stage I (minimal), Stage II (mild), Stage III (moderate), and Stage IV (severe) by using ASRM for determination of stages of endometriosis (American Society of Reproductive Medicine, 1979). The patients were divided into two groups: patients with early-stage (stage I or II of the disease) and late-stage (stage III or IV of the disease) of endometriosis. The relationship between stages of endometriosis and symptoms of the disease has been evaluated. Also, differences between disease stages among infertile women regarding risk factors have been assessed. Finally, expected treatment of the present type of endometriosis had been gathered from studied women in the form of medical and surgical treatment.

Data Collection Procedure and Ethical Considerations

The researchers reviewed the local and international literature to get more knowledge about the study. This also helped in designing the study tools. The tools were tested for content validity by five experts in the field of Obstetrics and Gynecological Nursing. The recommended modifications were done, and the final form was ready for use. The researchers started to collect data from women with endometriosis after explaining to each woman the aim of the study and then all the needed information were taken from all the women who accept to participate in this study.

Oral consent was taken from women who wanted to participate in this research. All procedures, including the human members, were in accordance with the ethical principles of the institutional and/or national research committee as well as the 1964 Helsinki Declaration and its later corrections or tantamount moral measures. The study was affirmed by the Zagazig University-Faculty of Nursing Ethical Committee with the ethical code ZU.NUR/25/22-8-2016.

Statistical Analysis

After information was assembled overhauled, coded, and took care of to factual programming IBM SPSS adaptation

22. The given charts were built utilizing Microsoft Excel programming. All measurable examinations were finished utilizing Pearson's chi-square test and alpha mistake of 0.05.

Results

The prevalence of endometriosis in one-year period was 11.8%. There were 636 candidates for laparoscopy at

Table 1. Distribution of the Studied Women According to Their Basic Characteristics (N = 85).

Women characteristics	N	%
Women age (years)		
Mean \pm SD		30.4 \pm 6.1
BMI (kg/m ²)		
Mean \pm SD		19.9 \pm 2.0
Parity		
Nulliparity	63	(74.1)
Primipara	18	(21.2)
Para 2 or more	4	(4.70)
Spontaneous abortion		
No	63	(74.1)
Yes	22	(25.9)
Infertility		
Primary	41	(48.2)
Secondary	44	(51.8)
Duration of infertility (years)		
Mean \pm SD		4.8 \pm 3.3

Data presented as Mean \pm SD.

Endoscopic Unit, in Zagazig University Hospitals. 85 cases out of them were diagnosed with endometriosis.

The distribution of the studied women according to their basic characteristics is presented in Table 1. The mean of their age and BMI was 30.4 \pm 6.1 and 19.9 \pm 2.0, respectively. The highest percentages of women were nulliparas 74.1%. Around 25.9% were exposed to spontaneous abortion. Meanwhile, a large portion of them had secondary infertility (51.8%). On the other hand, the mean duration of infertility was 4.8 \pm 3.3.

The severity of the disease was classified according to American Society of Reproductive Medicine scoring tool (ASRM) as 20.0% minimal (ASRM stage I), 34.1% mild (ASRM stage II), 29.4% moderate (ASRM stage III), and 16.5% severe (ASRM stage IV). Symptoms dispersion among patients with stage I, II disease, stage III and IV disease) of endometriosis displayed in Table 2, which shows that dyspareunia, congestive dysmenorrhea, infertility, painful bowel movements, constipation, or diarrhea during menstruation were more reported symptoms in all the stage of endometriosis. Dyspareunia was more common among early-stage endometriosis patients (31.8%). The difference observed was statistically significant ($p = .000^*$). Congestive dysmenorrhea was more obvious in those with late-stage endometriosis (27.1%).

Regarding the extent of endometriosis among studied women, Table 3 demonstrates the following factors: age, nulliparity, BMI, residence, and previous pelvic surgery were considered as risk factors in all stages of disease with statistically significant ($p < .05$). Differences observed regarding

Table 2. Distribution of Symptoms Associated with Endometriosis According to Disease Stage (N = 85).

Symptoms	Stages of disease				Chi-Square test	p value
	Stage I N (%)	Stage II N (%)	Stage III N (%)	Stage IV N (%)		
Congestive dysmenorrhea						
Yes	13 (15.2)	19 (22.4)	23 (27.1)	12 (14.1)	6.131	.10
No	4 (4.7)	10 (11.7)	2 (2.4)	2 (2.4)		
Dyspareunia						
Yes	4 (4.7)	27 (31.8)	21 (24.7)	14 (16.5)	37.289	.000*
No	13 (15.2)	2 (2.4)	4 (4.7)	0 (0.0)		
Infertility						
Primary infertility	8 (9.4)	23 (27.1)	8 (9.4)	2 (2.4)	20.326	.000*
Secondary infertility	9 (10.6)	6 (7.0)	17 (20.0)	12 (14.1)		
Painful bowel movements						
Yes	0 (0.0)	4 (4.7)	12 (14.1)	10 (11.8)	25.912	.000*
No	17 (20.0)	25 (29.4)	13 (15.3)	4 (4.7)		
Constipation or diarrhea during menstruation						
Yes	0 (0.0)	6 (7.0)	14 (16.5)	12 (14.1)	31.184	.000*
No	17 (20.0)	23 (27.1)	11 (12.9)	2 (2.4)		

MCP: P value based on Mont Carlo exact probability.

* $P < 0.05$ (significant).

Table 3. Distribution of Studied Women According to Following Risk Factors (N = 85).

Risk factors	Stages of disease				Chi-Square test	P value
	Stage I N (%)	Stage II N (%)	Stage III N (%)	Stage IV N (%)		
Women age (years) (mean ± SD)	27.0 ± 5.2	30.2 ± 6.3	32.8 ± 6.6	30.5 ± 3.8	139.790	.000
Nulliparity (n = 63)	11(17.4)	27(42.9)	15 (23.8)	10 (15.9)	14.116	.028*
Residence						
Urban	7 (8.2)	14 (16.5)	21 (24.7)	10 (11.8)	10.997	.012*
Rural	10 (11.8)	15 (17.6)	4 (4.7)	4 (4.7)		
BMI (kg/m ²) (mean ± SD)	19.8 ± 2.8	20.1 ± 1.3	19.8 ± 1.96	19.7 ± 2.6	47.682	.008*
Positive family history for endometriosis (n = 56)	9 (16.1)	18 (32.1)	21 (37.5)	8 (14.3)	5.580	.1
Prior pelvic surgery						
No surgery	11(12.9)	7 (8.2)	4 (4.7)	0 (0.0)	29.330	.001*
Laparoscopy	0 (0.0)	8 (9.4)	4 (4.7)	0 (0.0)		
Laparoscopy and Laparotomy	4 (4.7)	10 (11.8)	11 (12.9)	10 (11.8)		
Laparotomy	2 (2.4)	4 (4.7)	6 (7.1)	4 (4.7)		

MCP: P value based on Mont Carlo exact probability.

* P < 0.05 (significant).

Table 4. Expected Treatment for Present Type of Endometriosis.

Variables	N	%
Type of treatment for endometriosis (n = 112)		
Pain control	2	1.8
Fertility management	44	39.3
Hormonal treatment	4	3.6
Surgical management	62	55.3
Surgical management of endometriosis (n = 93)		
Deroofing and fulgeration of endometrioma	45	48.4
Adhesiolysis	30	32.3
Left ovarian cystectomy	8	8.6
Right ovarian cystectomy	6	6.4
Right salpingostomy	4	4.3

positive family history for endometriosis was not statistically significant between the four stages of endometriosis.

Among all the participant women, 55.3% had surgical management for present endometriosis, 39.3% received fertility management, 3.6% got hormonal treatment, and 1.8% took painkiller medications. Regarding, surgical management, about 48.4% of them undergone deroofing and fulgeration of endometrioma, 32.3% of them performed adhesiolysis for the management of adhesions related to this disease (Table 4).

Discussion

Endometriosis is a lifelong and progressive disease that requires strong, community-orientation for the women who are risky for the development of endometriosis because

pain can be repeated in spite of treatment. The current study was conducted to explore the risk factors for endometriosis and their relation to the stages of the disease for early detection and better management.

In the present study, BMI was lower among studied women with endometriosis with the mean (19.9 ± 2.0). This finding synchronized with the study conducted by Moini et al. (2013) in Iran about “Risk factors associated with endometriosis among infertile Iranian women” (Moini et al., 2013). One potential explanation of this connection might be the way that an anovulatory and irregular menstrual cycle auxiliary to the high estrogen level in thin women can lead to retrograde menstruation.

This study also showed that parity was associated with the risk of endometriosis, and nulliparity was more likely to report this disease than those with a history of parity. The possible explanation for the association between endometriosis and nulliparity is the disruption of pelvic anatomy and ovarian function which leads to infertility (Gao et al., 2019).

The current study revealed that congestive dysmenorrhea, dyspareunia, infertility, painful bowel movements, constipation, or diarrhea during menstruation were more reported symptoms in all the stages of endometriosis. Dyspareunia was the most common symptom among early-stage endometriosis patients (31.8%), this may be explained by the cul-de-sac and uterosacral ligaments are the most common sites of endometriosis (Shum et al., 2018). These areas are stretched or moved during intercourse. Congestive dysmenorrhea was a more apparent symptom in those with late-stage endometriosis (27.1%). The difference observed was statistically significant ($p = .000^*$).

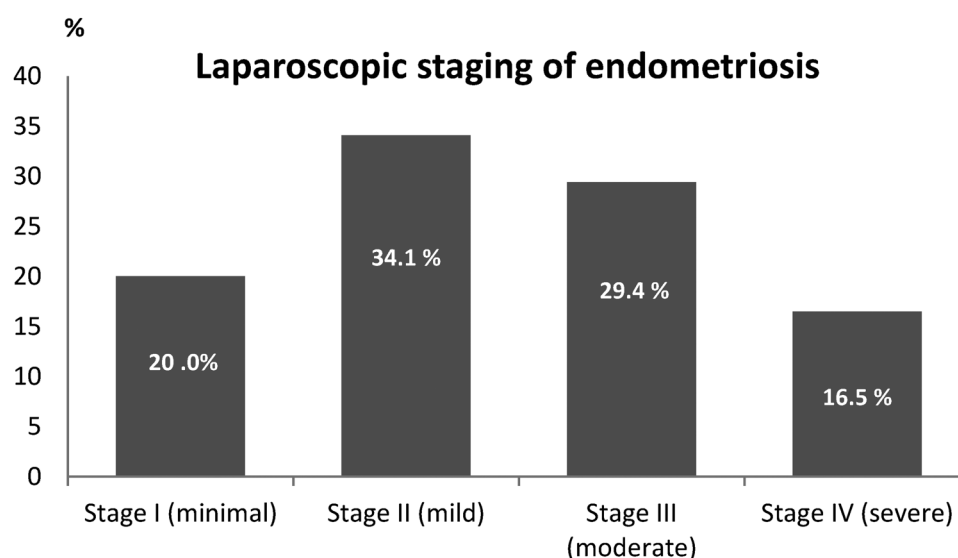


Figure 1. Laparoscopic staging of endometriosis according to American Society of Reproductive Medicine (1979) scoring tool.

At last, in the current study, there are various factors that may be useful in screening for endometriosis and anticipate the danger of endometriosis. Patient's characteristics such as age, equality, habitation, and BMI had been evaluated as indicators of endometriosis and we found a significant difference between stage of endometriosis and risk factors for endometriosis. Additionally, we watched a positive connection between the recently worked pelvic medical procedure and endometriosis. This point was also affirmed by a group of researchers, in 2016 in Iran with the study about "Evaluation of Risk Factors Associated with Endometriosis in Infertile Women" (Ashrafi et al., 2016).

The present study found that about 55.3% of cases had surgical management for present endometriosis and 32.3% of them performed adhesiolysis for the management of adhesions associated with this disease. These results agreed with Wolthuis et al. (2014) who reported that get rid of endometriotic regions, lysis of adhesions, and interference of nerve pathways has long been an essential part of the treatment of endometriosis (Wolthuis et al., 2014).

In the United States, some authors in 2010 revealed that the nurse plays an objective, fundamental part in well-being advancement, and prevention of the disease in the primary care setting, not only offering support and cooperation with the patient to facilitate quality of care but also in managing effective treatments to decrease pain, improve personal satisfaction, prevent metastasis of endometriosis, and further progression of the disease (Shafirir et al., 2018).

Endometriosis was staged as 20.0% stage I, 34.1% stage II (ASRM), 29.4% stage III (ASRM), and 16.5% stage IV according to ASRM scoring tool for classification of this disease. Also, women within reproductive age, nulliparity, lower body weight, urban residence, and past surgery of the pelvic area were considered as risk factors in all stages of disease with statistically significant differences.

Recommendations

- The paper provides suggestions on early screening of risk factors for endometriosis in relation to the disease stage would be useful for early identification and anticipation of the disease which are considered as the principal role for the nurse.
- This paper highlights that laparoscopy was very important for the diagnosis of endometriosis so, counseling before and after the laparoscopic procedure was mandatory to decrease the complications associated with it.

Strengths and Limitations

The qualities of our research include the following points: (1) the sample size was taken from Laparoscopic unit, not from outpatient clinics; (2) this study isn't done in Zagazig University, Faculty of Nursing before, and so it is useful to investigate this problem.

Some potential limitations must also be considered. First, a small sample size was included. Second, an appropriated tool for the diagnosis of dysmenorrhea, and dyspareunia don't be used and also, a limitation in statistical analysis.

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ORCID iD

Azza Ibrahim Abd el-kader  <https://orcid.org/0000-0003-0883-0714>

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