

The Prevalence of Typical and Subtle Lesions of Endometriosis Visualized in Diagnostic Laparoscopy for Women with Unexplained Infertility

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Abstract

To evaluate the prevalence of laparoscopic features of endometriosis in women complaining of unexplained infertility. 500 women complaining of unexplained infertility and presented at the infertility outpatient clinic of the hospital. Women were scheduled for diagnostic laparoscopy to evaluate their condition. Data was collected with a pre-designed proforma which included the socio-demographic characteristics and laparoscopic findings in various abdomino-pelvic organs. Participants' ages ranged from 20 to 35. During the study period, 92 cases of endometriosis were diagnosed out of the 500 infertile women seen. This gave the prevalence rate of 18.4%. The mean age of the women was 31.1 ± 2.4 years and the body mass index was 30.2 ± 3.4 . 296 (59.2%) patients presented with primary infertility, while 204 (40.8%) had secondary infertility and were all primiparous. Chocolate cysts were found to be bilateral in 34 (6.8%) patients and unilateral in 58 (11.6%). 34 (6.8%) patients had unilateral tubal adhesions, while 22 (4.4%) had bilateral adhesions. 452 (90.4%) patients had bilateral patent tubes while 27 (5.4%) and 21 (4.2%) patients had unilateral and bilateral tubal blockade respectively on dye test. 52 (10.4%) patients had adhesions at the cul-de-sac while 20 (4%) patients had adhesions to bowel.

Keywords

Endometriosis; Laparoscopy; Infertility

I. Introduction

Endometriosis is a chronic estrogen dependent gynecologic disorder that affects about 10% of women in their fertile period and that percentage is elevated to 30 - 40% percent among infertile women. [1]. However, in the general population, the precise rate is unknown because the pelvis has to be inspected at the time of surgery (preferably laparoscopy) which will settle on a conclusive finding [2]. It is identified as the presence of endometrium-like tissue thriving outside the uterus, most commonly on the ovaries and pelvic peritoneum [3]. Signs and symptoms include chronic pelvic pain, dysmenorrhea, dyspareunia, and reduced fertility [4].

The current view is that women of African descent are rarely affected by endometriosis. The most likely explanation is that the true prevalence is under reported [5]. While no significant difference in women of different races is seen in some reports [2], others have shown that black women have lower prevalence than in their Caucasian counterparts [6,7]. Its etiology has remained unknown. However retrograde menstruation, environmental toxins heredity and impaired immune function are suspiciously involved [3].

A number of risk factors have been suggested in the etiology of endometriosis. Over the previous decades it has been commonly presumed that the disease has been inaccurately perceived to affect higher social

class women, most likely explained by more abundant resources easing the pursuit of medical attention when compared to women of lower social class [8].

The patient's initial history aids in helping us suspect strongly the diagnosis of endometriosis. Infertility, dysmenorrhea and deep dyspareunia are the commonest presenting symptoms [9, 10]. Endometriosis is the most common cause of pelvic pain [5]. As the presentation is so variable, reaching a diagnosis based on history alone is difficult, and other conditions may mimic the disease [11]. For diagnostic purposes, laparoscopy has proven to be the gold standard unless the disease is noticeable in the vagina or elsewhere [2,5]. However transvaginal ultrasound (TVUS) and magnetic resonant imaging (MRI) may also be complementary as other non-invasive diagnostic methods [4].

The disease can involve a number of sites in the body. Approximately 50% of cases are in the ovary making it the most common site of the disease [12]. Other sites that are affected include the cul-de-sac, uterus, uterosacral ligaments, fallopian tubes and intestine [13]. 'Endometriomas' or 'Chocolate cysts' are defined as enlargements of the endometriotic cysts in the ovaries [4]. The goal of the study that had been performed in Ain Shams Maternity Hospital is to evaluate the prevalence of laparoscopic findings of endometriosis in women with unexplained infertility undergoing laparoscopy and dye test.

II. Patients and Methods

This was a cross sectional study conducted at Ain Shams Maternity University Hospital involving 500 infertile women, over a four-year period between January 2012 till December 2015. Data was collected with a pre-designed proforma.

Inclusion criteria:

1. Age: 20-35
2. Women with unexplained infertility either nulliparous or primiparous

Exclusion criteria:

- 1) Patients with previous history of pelvic surgery
- 2) Patients with chronic pelvic inflammatory disease

Patients were subjected to:

- 1) Full history taking, included the age, educational level, patient's occupation, gravidity and parity.
- 2) Complete physical examination.
- 3) Counseling and verbal consent was taken for every patient.
- 4) Laparoscopy was performed at the two phases of the menstrual cycle, excluding menstrual period. Carbon dioxide (Co₂) was utilized to create pneumoperitoneum in all patients.
- 5) Surgical management was done as required according to patient condition

Ethical consideration:

Institutional review board approval: The protocol was discussed by the ethical scientific committee for approving the study and

informed consent was obtained before participation.

Consent procedure:

The Investigator made certain that an appropriate informed consent process was in place to ensure that potential research subjects, or their authorized representatives, were fully informed about the nature and objectives of the clinical study, the potential risks and benefits of study participation, and their rights as research subjects. The Investigator obtained the written, signed informed consent of each subject, or the subject's authorized representative, prior to performing any study-specific procedures on the subject. The Investigator retained the original signed informed consent form.

Subject Confidentiality:

All laboratory specimens, evaluation forms, reports, video recordings, and other records that leave the site would not include unique personal data to maintain subject confidentiality.

Statistical methodology:

Retrieved data was recorded on an investigative report form. The data was analyzed with SPSS® for Windows®, version 15.0 (SPSS, Inc, USA). Description of quantitative (numerical) variables was performed in the form of mean, standard deviation (SD) and range. Description of qualitative (categorical) data was performed in the form of numbers and percent.

III. Results

This cross sectional study involved 500 women consented to participate in this study; during the 4-year study period. Out of the 500 infertile women seen there was 92 cases diagnosed with endometriosis giving a prevalence of 18.4%. The clinical characteristic of the patients were shown in Table 1. The mean age of the women was 31.1 ± 2.4 years and the body mass index was 30.2 ± 3.4 . The gravidity of the patients was 1 ± 0.8 , 312 women stopped their education at less than high school while 188 had passed the high school. 387 women were house wives while the others were laboring women. 296

(59.2%) of the patients presented with primary infertility, while 204 (40.8%) had secondary infertility and were all primiparous.

Table 2 shows the Laparoscopic and Dye Test findings of abdomino-pelvic organs. Twenty (4%) patients had involvement of bowel in regard to adhesion, while the ovary proved to be the most common site involved.

Table (1): the clinico-demographic features of women under the study

	Group I
Age	31.1 ± 2.4
Body mass index (kg/m^2)	30.2 ± 3.4
Gravidity	1 ± 0.8
Education	
≤High school	312
>High school	188
Occupation	
House wife	387
Employed/business Woman	113
Infertility	
Primary	296
Secondary	204

Table (2): the Laparoscopic and Dye Test findings of the various abdomino-pelvic organs in women under the study.

Feature	The number of cases	Percentage
Ovarian		
• Normal	327	65.4
• Unilateral endometrioma	58	11.6
• Bilateral endometrioma	34	6.8
• Not seen	81	16.2
Tubal		
• Normal	400	80
• Unilateral adhesions	34	6.8
• Bilateral adhesions	22	4.4
• Not seen	44	8.8
Cul de sac		
• Normal	385	77
• Adhesions	52	10.4
○ Mild	36	7.2
○ Moderate	8	1.6
○ Obliteration	8	1.6
• Implants	30	6
• Other lesions	33	6.6
Peritoneal		

• Normal	452	90.4
• Adhesions	32	6.4
• Implants	16	3.2
Bowel		
• Normal	465	93
• Adhesions	20	4
• Implants	15	3
Methylene blue test		
• Normal	452	90.4
• Unilateral obstruction	27	5.4
• Bilateral obstruction	21	4.2

IV. Discussion

It is very clear that endometriosis is strongly linked to infertility, as shown in this study that was done in Ain Shams University Maternity Hospital. In developed countries of the world the gold standard tool for management and evaluation of endometriosis is now laparoscopy [6]. Endometriosis has proven to be one of the leading causes of female infertility. The infertility may be just temporary in cases that have proven to be mild or moderate in severity. To restore fertility, surgeries can help in removing adhesions, scar tissues or even cysts as treatment of mild cases. In other cases (a tiny percentage),

women may unfortunately stay infertile. Physicians remain uncertain as to how fertility is affected by endometriosis. Plus, this study argues against the perception that endometriosis among women of African descent is uncommon. The prevalence of endometriosis in women under the study was 18.4%. A similar study done by Hebbar and Chawla [14] reported a prevalence of 4.7% which is significantly higher than the previous reports [15-17]. Meanwhile, in developed countries, they reported higher percentages [18]. More recently, a prevalence of 48.1% was reported by Fawole et al. [19] for endometriosis among symptomatic women which still is the highest prevalence reported in Africa, followed by a reported 20% [20].

The deliberate search for endometriosis could be responsible for the reported high prevalence in these studies. Hence, it is foreseeable that the prevalence of the disease in African women is suspected to rise in studies performed by gynecologist who are trained to detect endometriosis during laparoscopy [21]. All the patients were either nulliparous or primiparous in this review. In a previous review paper, 20 cases were reported and 82% were nulliparous women [22]. In the current study, 'endometriomas' were seen in 18.4% of the patients. Documentations in the literature will entirely agree with these findings [1,3]. However, rupture of the chocolate cysts in the abdomen, plus the release of cells from the endometrium and blood could cause irritation of the peritoneum leading to ascites and this can deteriorate the infertility problem [5]. This then justifies suitable, fitting and hasty management of cases of ovarian endometriosis.

Tubal adhesions visualized with laparoscopy was found in 9.6%, while more than 90% of the patients have bilateral patent tubes observed with a dye test. Documentations in the literature would entirely agree with the findings. Tubal occlusion was rarely found in patients with endometriosis [3]. This verifies that other mechanisms are involved in the infertility experienced in endometriotic patients [23].

Nevertheless, severe and also moderate cases of endometriosis are associated with pelvic adhesions that alter the pelvic anatomy, encasing the ovary and prevent normal tubo-ovarian apposition [3]. A systematic review proposes that pregnancies are halved in

endometriosis in comparison with tubal infertility [24]. Advanced cases of endometriosis have diminished ovarian reserve, poor oocyte and quality of embryo and defective implantation have also been suggested [25]. High levels of cytokines, growth factors and activated macrophages have proven to be toxic to sperm function and embryo survival, they were found in the peritoneal fluid from women with endometriosis. [26].

Although many theories have been suggested, the cause of endometriosis is still a mystery. However, this could not be concluded from this study, a theory reported that during menstruation some of the tissue and blood back up through the fallopian tubes into the peritoneal cavity "retrograde menstruation," where it attaches and grows. Another theory states that certain families may have genetic factors that predispose to the disease. Current research is also looking at the role of activating cells of the immune system that may secrete factors which stimulate endometriosis [6].

Diagnosis begins with a gynecologist evaluating the medical history and a complete physical examination of the patients. A diagnosis of endometriosis can only be certain when a laparoscopy is performed by the physician.

As was done in all patients in this study, using the laparoscope to explore the pelvic area can often be used to determine the locations, extent, and size of the endometrial growths. Although, other examinations which may be performed to reach a diagnosis of endometriosis may not have been used in these

patients reviewed. During a laparoscopy, biopsy samples could be removed, for microscopic examination to expose abnormal or malignant cells.

The strength of our study is the ability to perform certain pathological confirmations (histological presence of glands and stroma of the endometrium), this explains that the number of endometriotic cases equals that of endometriomas; in which biopsies were taken while in other lesions the findings were non-specific. Citing the prevalence of endometriosis in females of African descent has contributed enormously to this work

In conclusion, endometriosis has proven to be a significant and prevalent gynecological problem in women suffering from infertility. The gold standard diagnostic tool remains laparoscopy exposing cul-de-sac adhesions (seen in 10.4%) and endometriomas (seen in 18.4%) while the majority (90.4%) had bilateral patent tubes. Efforts should be directed at making the accessibility and affordability of the laparoscopic procedure available for physicians practicing gynecology in developing country settings.

Declaration of Interest

The authors state no conflicts of interest. The authors alone are responsible for the contents and writing of the paper.

V. References

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