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ORIGINAL ARTICLE

Prevalence, Clinical and Laparoscopic Features of Endometriosis Among Infertile Women

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Abstract

Objective To study the prevalence, clinical and laparoscopic characteristics of endometriosis in infertile women.
Study Design This is a hospital-based prospective study.
Patients Five hundred and two (502) patients underwent diagnostic laparoscopy for evaluation of cause for infertility. Staging of endometriosis was done according to the rAFS scoring system.
Results Out of 502 women, 276 (54.98 %) showed the presence of endometriosis, while 226 (45.01 %) did not have endometriosis. One hundred and eighty-three (66.3 %) women had stage I endometriosis, 49 (17.77 %) had stage II, 23 (8.33 %) had stage III and 21 (7.6 %) had stage IV endometriosis.

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Conclusion More than 50 % of patients in our study were asymptomatic; however, the presence of menorrhagia, dysmenorrhoea, dyspareunia and chronic pelvic pain are also clinically statistically significant. So, we would like to recommend the evaluation and treatment of a patient reporting in gynaecological OPD with the above-mentioned complaints with high suspicion of endometriosis.

Keywords Laparoscopy · Infertile women · Endometriosis · Dysmenorrhoea · Chronic pelvic pain

Introduction

Endometriosis is one of the most common diseases encountered in gynaecological outdoors, and increasing evidences suggest it to be a part of uterine reproductive dysfunction syndrome [1]. It is a chronic disease, which is characterized by the presence of functional endometrial glands and stroma outside the uterine cavity with locally invasive characteristics as first described by Thomas Cullen [2]. Carl Rokitansky was the discoverer of endometriosis, while the term was coined by John A Sampson who also gave the famous Sampsons theory of retrograde menstruation to describe the pathogenesis of it [3, 4]. Its prevalence as reported in the literature is of very wide range [5]. 30–50 % women with endometriosis are infertile, while 25–50 % of infertile women have endometriosis [6]. 10–20 % of fertile women suffer from endometriosis [7]. It is, however, difficult to diagnose and treat it completely.

Materials and Methods

A prospective study was conducted in the Department of Obstetrics and Gynaecology, Institute of Kidney disease and Research Centre, Ahmedabad, Gujarat, for the period from January 2014 to August 2015. The study aimed to determine the prevalence, clinical and laparoscopic characteristics of endometriosis in infertile women.

Inclusion Criteria

Infertile females with either primary or secondary infertility who were subjected to diagnostic hystero-laparoscopy and chromopertubation test and were diagnosed to have endometriosis were included in the study; their complaints, physical examination and sonographic findings were also noticed.

Exclusion Criteria

Women with normal fertility, pelvic inflammatory disease and adhesions due to infections or previous surgeries were excluded from the study.

All cases included in the study were analysed for the following characteristics.

- Patients demographics: Age, active married life, duration and type of infertility, menstrual history with days of bleeding, cycle frequency and flow pattern, association of dysmenorrhoea, dyspareunia, chronic pelvic pain, urinary symptoms and their correlation with stage of endometriosis according to the revised American Fertility Society Grading [8].
- Physical examination: Mobility of uterus, presence of abdominal/adnexal masses and presence of adnexal tenderness were evaluated.
- USG finding: Presence of endometriomas and probe tenderness were noted.
- Laparoscopic findings: Diagnostic laparoscopy done with 3 trocars with the main umbilical 10-mm port for laparoscope and 2. 5-mm ancillary trocars in lower abdomen lateral to inferior epigastric artery. Laparoscopic view of **e**ndometriotic lesions was evaluated, which varied from white, yellow, non-pigmented lesions to dark blue, powder-burn black, red or brown lesions. The size, location and depth of these lesions were noted to grade the endometriosis. Score was given according to the visual appearance of the lesion, and staging was done if score is 1–5 as minimal, 6–15 as mild, 16–40 as moderate and > 40 as severe disease. This laparoscopic staging was based on the revised AFS scoring, which categorized the patients into 4 stages.
- Stage I: (Minimal) involved a few endometrial implants, most often in the cul-de-sac or pelvic wall of ovarian fossa.
- Stage II: (Mild) comprised of endometrial implants affecting one or both ovaries or lesions more than above in the pouch.
- Stage III: (Moderate) involved moderate levels of endometriosis with implants in several pelvic areas and in one or both ovaries.
- Stage IV: (Severe) involved widespread endometriosis implants through the pelvic area or obliterated pouch of Douglas.

All collected data were entered into the SPSS version 20. Categorical data are expressed in frequency or percentage. Chi-square test and Fisher's exact test have been performed to obtain *P* value for categorical data.

Results

Five hundred and two (502) patients with infertility were subjected to diagnostic hystero-laparoscopy and chromopertubation test during the period from January 2014 to August 2015. After all inclusion and exclusion criteria, only 276 (54.98 %) patients were included in the study as having laparoscopic evidence of endometriosis. The mean age of patients included was 28.55 ± 4.29 years (19–44 years). Of these, 235 (85.14 %) had primary infertility and 41 patients (14.85 %) had secondary infertility. Apart from infertility, the commonest complaints among the patients included in the study were dysmenorrhoea 176 (63.76 %) followed by dyspareunia 44 (15.94 %), menorrhagia 34 (12.31 %), menstrual irregularity 32 (11.59 %) and chronic pelvic pain 25 (9.05 %). However, more than 50 % of cases were asymptomatic. On examination, 37 (13.40 %) patients had tenderness, 90 (32.70 %) patients had adnexal mass and 67 (24.27 %) had restricted mobility. There was a statistically significant association between adnexal tenderness and restricted uterine mobility with staging of the disease ($P < 0.01$). Abnormal USG findings as presence of endometrioma with ground-glass appearance were seen in 31 (11.23 %) cases. The presence of endometriomas on sonography is found to be statistically significant as confirmed laparoscopically and also with the stage of the disease. Based on revised AFS score (1985), stage I endometriosis was seen in 183 patients (66.3 %); stage II endometriosis in 49 patients (17.75 %); stage III endometriosis in 23 patients (8.33 %); and stage IV endometriosis in 21 patients (7.6 %). The association of clinical signs and symptoms with the stage of disease is shown in Fig. 1 and Table 1. The association of laparoscopic and USG findings with the stage of disease is shown in Fig. 2 and Table 2. In our study, we found a definite correlation of USG and laparoscopic evidence of endometriosis with the stage of disease. The presence of bilateral blocked tubes also had statistically significant association with the severity of stage of endometriosis. All patients with minimal and mild (stage I/II) endometriosis were treated by fulguration/cauterization with bipolar cautery followed by three doses of GnRH agonist. Moderate and severe (stage III/IV) endometriosis were treated depending on laparoscopic findings, i.e. adhesiolysis, endometrioma cyst wall excision followed by three doses of leupragon (3.75 mg) or goserelin (3.6 mg) at an interval of 28 days.

Discussion

History and clinical examination can provide us a clue to the diagnosis to endometriosis.

The primary presentation of endometriosis is pelvic pain and/or infertility. 45–82 % of women with chronic pelvic pain have endometriosis, while 2.1–78 % of infertile women have the same [5, 9]; the incidence of complaints like chronic pelvic pain and others is more common with infertile women than with fertile women [10, 11].

Transvaginal ultrasound can also help in its diagnosis by telling us about probe tenderness, which can be used as a surrogate marker for rectovaginal endometriotic nodule, and about endometriomas, which are deep ovarian endometriosis and seen as ground-glass homogeneous opacity that is an indicator of moderate-to-severe disease;

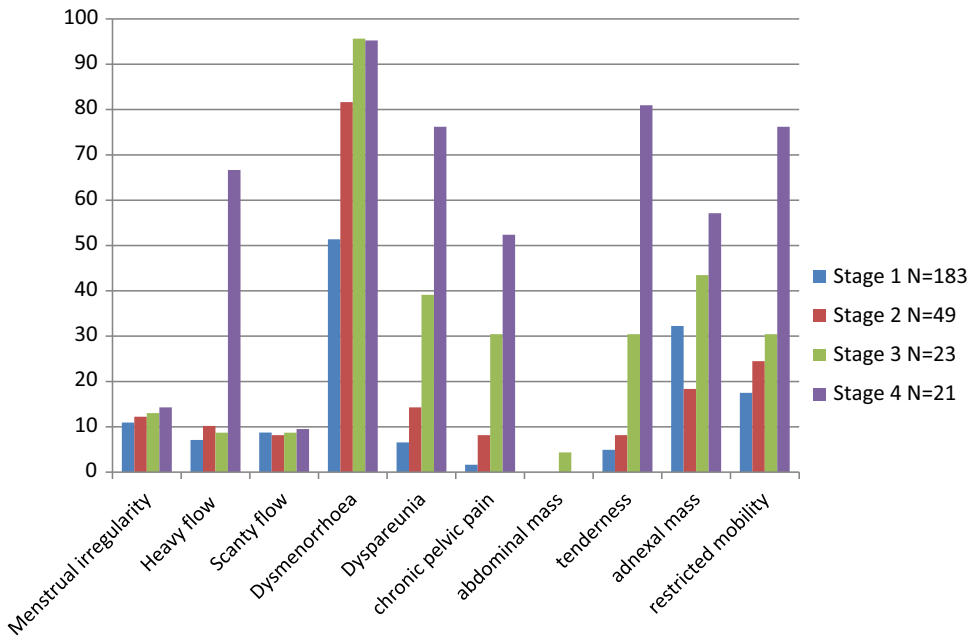

Fig. 1 Association of clinical presentations of endometriosis with staging

Table 1 Association of clinical presentations of endometriosis with staging

Clinical signs and symptoms	Stage I ($N = 183$)		Stage II ($N = 49$)		Stage III ($N = 23$)		Stage 4 ($N = 21$)		P value
	N (%)	OR	N (%)	OR	N (%)	OR	N (%)	OR	
Menstrual irregularity	20 (10.93)	1.00	6 (12.24)	1.14	3 (13.04)	1.22	3 (14.29)	1.36	0.96 (NS)
Heavy menstrual flow	13 (7.10)	1.00	5 (10.20)	1.49	2 (8.70)	1.25	14 (66.67)	26.15	<0.01[a]
Scanty menstrual flow	16 (8.74)	1.00	4 (8.16)	0.93	2 (8.70)	0.99	2 (9.52)	1.10	0.99 (NS)
Dysmenorrhoea	94 (51.37)	1.00	40 (81.63)	4.21	22 (95.65)	20.83	20 (95.24)	18.94	<0.01[a]
Dyspareunia	12 (6.56)	1.00	7 (14.29)	2.38	9 (39.13)	9.16	16 (76.19)	45.6	<0.01[a]
Chronic pelvic pain	3 (1.64)	1.00	4 (8.16)	5.33	7 (30.43)	26.25	11 (52.38)	66	<0.01[a]
Abdominal mass	0 (0)	1.00	0 (0)	N/A	1 (4.35)	N/A	0 (0)	N/A	<0.01[a]
Tenderness	9 (4.92)	1.00	4 (8.16)	1.72	7 (30.43)	8.46	17 (80.95)	82.17	<0.01[a]
Adnexal mass	59 (32.24)	1.00	9 (18.37)	0.47	10 (43.48)	1.62	12 (57.14)	2.80	<0.01[a]
Restricted mobility	32 (17.49)	1.00	12 (24.49)	0.15	7 (30.43)	2.06	16 (76.19)	15.1	<0.01[a]

OR odds ratios, *NS* non-significant difference between these groups

$P < 0.05$ considered to be statistically significant difference

[a] Significant difference between these groups

however, it cannot tell about superficial or deep peritoneal implants and about adhesions caused due to endometriosis or about obliterated POD. Laparoscopy is considered its gold-standard diagnostic tool as it provides direct visualization of endometriotic lesions. Their laparoscopic features are unique and can easily be characterized into early or late lesions: early lesions are small, flat patches, flecks, blebs or even polyps of red, brown colour, advanced lesions are black puckered, while healed are white fibrotic lesions which can be present on the pelvic surfaces, or can be on the ovaries, uterus or other pelvic organs. Ovaries are the most common organs affected by endometriosis, and it can be superficial or deep involvement, which is important from grading point of view also. Also, a strong correlation has been observed between depth of lesion > 10 mm and chronic pelvic pain [12]. Endometriomas or chocolate cysts are deep ovarian endometriosis. Beyond diagnosis, laparoscopy also provides with an opportunity to treat the disease, i.e. fulgurate the lesion or to do adhesiolysis as according to the severity of disease. ESHRE guidelines recommend laparoscopy as gold-standard measure to diagnose endometriosis [13]. Laufer MR et al. and Brosens I et al. even recommend hydroflotation technique to improve visualization of even early lesions like free-floating adhesions and focal microvascularization [14, 15]. Our study has shown significant correlation between presence of endometriomas and grading of the disease. Hughesdon et al. found in a detailed study of 29 ovarian specimens with endometriomas that in 90 % of cases it was formed by a pseudocyst and part of the ovarian cortex is invaginated [16]. Among 31 cases who had endometrioma in our study, diagnosed on transvaginal USG, 24 cases had stage III and IV endometriosis as confirmed by laparoscopy findings according to rAFS score (1985).

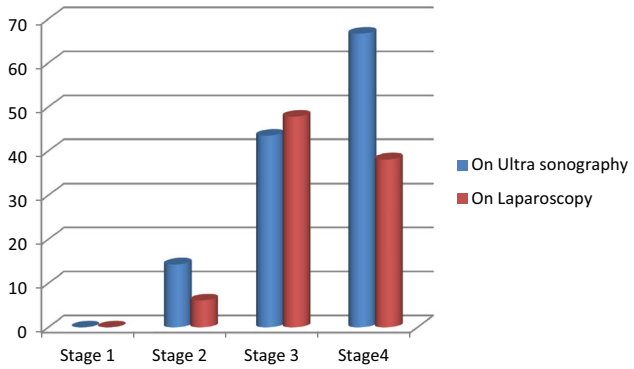

Fig. 2 Correlation of endometriomas on sonography and laparoscopy

Endometriosis can affect almost each and every organ of female reproductive system and thence adversely affects the reproductive ability of a female. The exact mechanism by which it causes infertility is still controversial. Hormonal, genetic and environmental factors cause altered peritoneal fluid composition that is one of the causes and leads to an increased levels of prostaglandins, proteases, cytokines and vascular endothelial growth factor (VEGF) in the peritoneal fluid [17]. It can affect oocyte release, its travel in the pelvis, sperm movement, embryo quality and fallopian tube function [18].

Meuleman C et al. have reported 47 % prevalence of endometriosis in infertile women [19], while in our study it is slightly high, 54.98 %.

Valson H et al. in 2016 reported a very high prevalence of endometriosis among infertile women of about 73.33 % [20], while Mishra VV et al. in 2014 reported it to be 48.38 % [21].

The majority of cases in our study had stage I disease, and most of them were asymptomatic while as severity of stage increased, severity of symptom presentation increases

Table 2 Association of ultrasonographic and laparoscopic findings with staging of endometriosis

Laparoscopic findings	Stage I ($N = 183$)		Stage II ($N = 49$)		Stage III ($N = 23$)		Stage 4 ($N = 21$)		P value
	N (%)	OR	N (%)	OR	N (%)	OR	N (%)	OR	
Endometrioma on ultrasonography	0 (0 %)	1.00	7 (14.29 %)	N/A	10 (43.48 %)	N/A	14 (66.67 %)	N/A	<0.01[a]
Endometrioma on laparoscopy	0 (0 %)	1.00	3 (6.12 %)	N/A	11 (47.83 %)	N/A	8 (38.10 %)	N/A	<0.01[a]

OR odds ratios, *NS* non-significant difference between these groups

$P < 0.05$ considered to be statistically significant difference

[a] Significant difference between these groups

and also sonographic presentation of endometrioma increases in a statistically significant manner.

Conclusion

Endometriosis is a benign disease with increasing prevalence because of increased diagnostic modality use as well as increased awareness of symptom profile among patients of reproductive age group. Also, women attending infertility clinic underwent laparoscopy for routine evaluation of cause of it, and thus, even minimal disease without any obvious symptomatology can be picked. Though majority of these women are asymptomatic, many attend the clinic with subsequent complaints of infertility, dysmenorrhoea, dyspareunia, chronic pelvic pain, menstrual irregularities, restricted uterine mobility and forniceal tenderness. The presence of endometriomas on transvaginal ultrasound has a strong correlation with the severity and stage of the disease. Thus, this study highlights the higher prevalence of endometriosis in our population, particularly in asymptomatic infertile females. More than 50 % of patients in our study were asymptomatic; however, the presence of menorrhagia, dysmenorrhoea, dyspareunia and chronic pelvic pain are also clinically statistically significant. So, we would like to recommend the evaluation and treatment of a patient reporting in gynaecological OPD with the above-mentioned complaints with high suspicion of endometriosis.

Compliance with Ethical Standards

Conflicts of interest None.

Informed Consent Informed written consent was obtained from every patient to enrol them in this study.

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