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Research Article

Study of endometriosis in women of reproductive age, laparoscopic management and its outcome

Hariharan Valson¹, Chinmay Kulkarni^{1*}, Bhavuray Teli², Nazer T.¹

¹Department of Obstetrics and Gynaecology, ²Department of General and Laparoscopic surgery, DM Wayanad Institute of Medical Sciences, Wayanad, Kerala, India

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***Correspondence:**

Dr. Chinmay Kulkarni,

E-mail: kulkarnichinnu@gmail.com

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ABSTRACT

Background: The prevalence of endometriosis is seen to be from 10% to 20% in the reproductive age group. The prevalence of endometriosis is 30% to 70% among women presenting with infertility. In our study the incidence of endometriosis appears to be on the higher side. The objective is to find out the prevalence of endometriosis in the female population in the reproductive age and to study the outcome after laparoscopic surgery in infertile women with endometriosis

Methods: A total of 200 patients who presented with symptoms of dysmenorrhoea, dyspareunia, chronic pelvic pain with or/without infertility were studied in the women of reproductive age group. The diagnostic/operative laparoscopy was performed in 75 patients. Endometriosis was identified by laparoscopy in 50 cases and confirmed by histopathological examination.

Results: Out of the above 200 patients, 25% (50 cases) were diagnosed as cases of endometriosis. Out of which, 50% (25 cases) patients had moderate to severe endometriosis. The prevalence of infertility was 22.5% (45 cases out of 200). Endometriosis was the cause of infertility in 33 patients. 25 patients had moderate to severe endometriosis and remaining 8 cases minimal to mild disease. The prevalence of endometriosis was 73.33% in infertile women. The fertility rate after surgery, during the 2 years follow up is 36.36% (12 cases conceived out of 33 cases).

Conclusions: The prevalence of endometriosis in infertile women is higher and the outcome after laparoscopic surgery is encouraging. The symptoms and clinical signs should raise the suspicion of pelvic endometriosis.

Keywords: Infertility, Laparoscopy, Endometriosis, Pelvic pain, Dysmenorrhoea

INTRODUCTION

Endometriosis is defined as a chronic and recurrent disease characterised by the presence and proliferation of endometrial glands and stroma outside the uterine cavity. It is responsible for varied and disabling symptoms and it also has an adverse impact on fertility. The incidence of endometriosis remains unknown because of the poor correlation between its presence and symptoms. The prevalence of endometriosis in reproductive women is around 10 % to 20% and endometriosis is the cause of infertility in 30% to 70% of patients coming for infertility investigation.^{1,2}

The aetiology of endometriosis is complex and multifactorial.³ Even though it is benign in nature; the majority of women do not improve if left untreated. The most common symptoms of endometriosis are dysmenorrhoea, dyspareunia, pelvic pain and infertility.⁴ A large prospective study by Adamson et al, 1993 showed that laparoscopic surgery significantly increased the cumulative pregnancy rate which was confirmed by a further meta-analysis in 1994. The surgical modalities include laparoscopy and laparotomy. Medical hormone treatment has been unsuccessful in treating infertile women as it does not improve the fertility rate; but it has a role in providing symptomatic relief and suppressing

the disease after laparoscopic surgery.⁵ Laparoscopic surgery is widely used as a diagnostic and therapeutic tool as it has quicker recovery time, shorter hospital stay, reduced physical and psychological stress, unlike laparotomy.

This study was done to find out the prevalence of endometriosis in the female population and to know the outcome after laparoscopic surgery.

METHODS

This study was performed at DM WIMS Medical College, Wayanad, Kerala, between 01 Dec 2012 to 31 Dec 2014. The patients included in the study were in the age group 20 to 45 years with symptoms of dysmenorrhoea, dyspareunia, pelvic pain and infertility. Pelvic examination was done and clinical findings of POD tenderness with nodular surface, restricted mobility of uterus or fixed retroverted uterus with adnexal mass either unilateral or bilateral were noted. These cases were subjected for pelvic ultrasound (USG) to look for altered pelvic anatomy and ovarian endometriomas. Diagnostic standard three-trocar laparoscopy was done under general anaesthesia, with a 10mm operating laparoscope inserted through an umbilical port and two 5mm sheaths inserted in the lower abdominal quadrants lateral to the inferior epigastric artery.

Disease staging was done using the Revised- American Fertility Society (R-AFS) classification score. Scores 1 to 5 were classified as stage 1 (minimal), scores from 6 to 15 were stage 2 (mild), scores 16 to 40 with mild adhesions were classified as stage 3 (moderate) and scores above 40 classified as stage 4 (severe). Ovarian endometriomas were a marker of severe disease.

In the operative laparoscopy removal of lesions was done by:

1. Bipolar cauterisation and laparoscopic scissors.
2. The endometriomas were removed by cystectomy with maximum conservation of ovarian tissue.
3. Drainage and fulguration in very difficult cases.
4. Adhesiolysis for adhesions was done.
5. Chromopertubation was done to see tubal patency in all cases of infertility (45cases).

All the specimens retrieved were sent for histopathological (HPE) confirmation.

RESULTS

The prevalence of endometriosis (Table1) in women, who were included in the study, was found to be high (25%). The incidence of infertility was 22.5% (45) among the total cases (200) included in the study. In clinical examination, 37.5% (75 patients) were suspected to have endometriosis and subjected to pelvic ultrasound. USG pelvis revealed altered pelvic anatomy in some cases and

ovarian endometriomas in 20 % (16 cases out of 75). Diagnostic/operative laparoscopy was done in 75 cases. Endometriosis was diagnosed in 50 cases, moderate to severe disease was seen in 25 cases and remaining 25 cases had minimal to mild disease. Pelvic endometriosis was the cause of infertility in 33 cases. There is increased prevalence of endometriosis in 20-30 years age group.

Table 1: The prevalence of endometriosis in various age groups.

Age group (years)	No. of patients	Prevalence (%)
20-30	25	50%
31-40	21	42%
41-45	04	8%

The prevalence of overall infertility (Table 2) was highest in the 20 to 30 years age group (78.78%). The prevalence of endometriosis was 73.33% in women suffering from infertility.

Table 2: Age wise distribution of infertility in endometriosis.

Age group (years)	Primary infertility	Secondary infertility	Prevalence (%)
20-30	20	06	78.78
31-40	02	05	21.22
41-45	nil	nil	nil

The maximum number of patients with endometriosis belongs to stage 3 (Table 3). The higher prevalence (75%) of infertility was observed in stage 3 and 4 diseases (25 out of 33 cases).

Table 3: Distribution of patients according to (R-AFS) classification and staging.

Stage of the disease	No. of patients	Prevalence of endometriosis in various stages (%)	No. of patients with infertility
Stage 1	12	24%	3
Stage 2	13	26%	5
Stage 3	15	30%	15
Stage 4	10	20%	10

A total of 16 cases had ovarian endometriomas indicating severe disease (Table 4). 10 cases had bilateral tubal block. Cystectomy was the major procedure done (Table 5).

Surgically treated cases were given leuprolide injection, 3.75 mg, intramuscularly, one dose immediately following laparoscopic surgery, before going for induction of ovulation, intrauterine insemination (IUI) or artificial reproduction technology (ART) by in-vitro fertilisation (IVF) in the follow up.

Table 4: Laparoscopic findings in women with endometriosis (50 cases).

Characteristic findings	No. of patients	Percentage
Site of endometriosis		
Ovary	16	32%
Unilateral	7	14%
Bilateral	9	18%
POD	5	10%
Posterior surface of uterus	3	6%
Uterosacral ligaments	2	4%
Adhesions(thick dense)		
Present	16	32%
Absent	34	82%
Chromopertubation (33 cases of infertility) due to endometriosis		
Unilateral patent tube	3	9.09%
Bilateral patent tubes	20	66.6%
Bilateral tubal block	10	30.30%

Table 5: The methods of laparoscopic procedures done.

Surgical procedure	Number of cases	Percentage
Cystectomy with/without adhesiolysis	12	24%
Chocolate cyst drainage with fulguration	04	08%
Adhesiolysis and remodelling of anatomy	09	18%
Bipolar cauterisation, scissor excision of deep lesions with cauterisation	25	50%

We had 25 cases in stage 3 and 4 out of which 5 patients conceived after treatment (Table 6).

Table 6: Table showing the success rate of pregnancy after laparoscopic surgery.

R-AFS stage	No. of patient	Pregnant	Percentage (%)
Stage 1	04	04	100
Stage 2	04	03	75
Stage 3	15	04	26.66
Stage 4	10	01	10
total	33	12	36.36

The reproductive outcome shows some association with the R- AFS score in our study (Table 7).

Table 7: Fertility rate as per R-AFS scoring.

R-AFS stages	Stage 1to2 (minimal to mild) [n=25]	Stage 3 (moderate) [n=15]	Stage 4 (severe) [n=10]
No of pregnancies (%)	07(28%)	04 (26.66%)	01(10%)
No of term pregnancy (%)	06 (85.71%)	04 (80%)	01(100%)

In fertile patients (17 patients) with endometriosis, Medroxyprogesterone acetate (MPA) injection, 150mg intramuscularly was given at 3 monthly interval for 3 doses and thereafter followed up for pain relief and suppression of the disease process. In these cases more than 80% of women got good relief from symptoms of pelvic pain and dysmenorrhoea. Four patients underwent TAH with BSO.

Out of the 33 cases of infertility due to endometriosis, 12 (36.36%) cases have conceived. Seven patients conceived naturally with clomiphene induction, in this one patient had spontaneous abortion. Two patients conceived by clomiphene and gonadotropin induction with IUI. Another three conceived by gonadotropin induction and ART by IVF in the nearby ART centre (one triplet and two twins).

Table 8: Comparison of pregnancy rates in various studies.

Author	No of infertile cases due to endometriosis	Stages of endometriosis as per R-AFS classification (operated)	Pregnancy rate (%)	Follow up period
Berrata al (1998) ²⁴	64	3 and 4	66.7%	2 years
Jones and Sutton (2002) ³¹	39	2 and 3	39.5% (15)	1 year
Elsheik et al (2003) ³²	151	1 to 4	53% (80)	2 years
Godinjak et al (2005) ²³	45	3 and 4	35% (15)	1 year
Fuchs et al (2007) ²⁸	34	1 to 4	65% (22)	8.5 months
Teksin Cirpan (2013) ³³	52	1 to 4	44% (23)	1 year
Hye Jun Lee et al (2013) ³⁴	43	1 to 4	41.9% (18)	1 year
Our study	33	1 to 4	37% (12)	2 years

DISCUSSION

Endometriosis remains a diagnostic as well as a therapeutic dilemma. It is considered as an enigma; hence it still intrigues researchers to addressing the cause and the management of the disease in every possible way. Endometriosis has a profound impact on quality of life, and developing a therapy that also improves fertility remains a challenge for gynaecologists.

The exact mechanism by which it causes infertility is still unclear. The projected sequences of the causes of infertility in cases of endometriosis are by an altered peritoneal fluid composition as a result of hormonal, genetic and environmental factors.^{6,7} One of the accepted theories is increased levels of prostaglandins, proteases, and cytokines and vascular endothelial growth factor (VEGF) in the peritoneal fluid.⁸ These alterations adversely affect the mechanism of ovum pick up, sperm motility, embryo quality and poor tubal function. These altered peritoneal fluid composition and adhesions cause severe tubal dysfunction,⁹ the actual prevalence is difficult to quantify because of its very wide range in various studies across the world.¹⁰⁻¹² In one of the studies, it has been shown that approximately 47% of women with infertility have endometriosis.¹³ In a study done by Tsuzi et al, the prevalence was 63%. In our study it is 73.33%. The diagnostic utility of USG in endometriosis is limited, but it can give corroborative evidences when there are ovarian endometriomas.¹⁵

Medical management accepts the basic principle of reducing inflammation, suppressing ovarian cycles and inhibiting the effect of oestrogen but its role in treatment of infertility is limited. Medical management can be used prior to surgery to decrease the size of endometriotic lesions and the extent of the operation. Conservative surgical procedures like adhesiolysis and removal of endometriotic cysts with post-operative medical therapy with OCP for more than a year can give longer duration of pain relief and delay the anatomical recurrence rates.¹⁶⁻¹⁹

The studies in the Table 8 include observational studies, randomized controlled studies and non-randomized studies.

The pregnancy rate in our study was 36.36%. The fertility outcome was better with stage 1 and stage 2 disease (87.5%). The success rate in moderate to severe disease was 20%. It was better in patients who underwent cystectomy in severe disease. After surgical treatment, the pregnancy rate and live birth rate did improve.

The recent advances in operative laparoscopy have changed the view in the management of endometriosis with infertility. The laparoscopic treatment involves the identifying and removal of lesions by cauterization, fulguration or laser evaporation for minimal to mild disease, adhesiolysis, excision of deep lesions,

cystectomy, drainage and coagulation for endometriomas of ovary (moderate to severe disease). A randomized controlled trial (RCT) was done by the Canadian collaborative study on endometriosis reveal a definite improvement in fertility rate. Based on a systematic review and meta-analysis, the ESHRE guideline has proposed that ablation of endometriotic lesions with adhesiolysis in minimal to mild endometriosis improves fertility. A more recent meta-analysis revealed that the pregnancy rate increases after laparoscopic ablation in women with stage 1 and 2 endometriosis.^{21,22} Laparoscopic cystectomy for ovarian endometrioma (size more than 3-4cm: stage 3 and 4) results in improvements in pregnancy rates as compared with cyst drainage and coagulation.^{23,24} In our study too we found a better outcome with cystectomy. The evidences from observational studies suggest that women who have stage 3 and 4 endometriosis without any other identifiable infertility factors may benefit from surgical treatment.²⁵⁻²⁶ A study by Charles Chaperon et al used surgical modality of treatment for endometriosis involving the uterosacral ligaments and obliteration of cul-de-sac. The overall intrauterine pregnancy rate, including births and abortions, was 50% (15 patients). 11 had spontaneous intra uterine pregnancy remaining 3 had induction of ovulation and one pregnancy occurred after IVF. 12 gave birth normally at term; one had an ectopic and remaining two had miscarriage.²⁷ Fuchs F et al studied 64 patients with infertility in all stages by operative laparoscopy. 20 patients dropped out of study, 65% (22) patients became pregnant within 8.5 months. 89% with stage 1 and 2 and 56% with stage 3 and 4 got pregnant within one month post-surgery. They recommend complete surgical treatment for such patients to increase their chance of conceiving spontaneously or by ART.²⁸ In a study by Sahu L et al, the fertility rate was 46%.²⁹ In our study the fertility rate is (36.36%) comparatively lesser than other studies. The probable reason could be the higher prevalence of moderate to severe disease in infertile patients (75.75%) and many patients with severe disease were unwilling to undergo ART due to financial constraints. It is generally believed the prevalence of endometriosis is less common in India, but in our study in the Wayanad district of Kerala it was 25% of all the reproductive women studied. The most common site was in the pelvis with obliteration of cul-de-sac and ovarian endometriomas (Figure 1 and 2). The diagnosis can be well established in all cases by laparoscopy and HPE confirmation.³⁰



Figure 1: Showing powder burn red lesions (stage I).

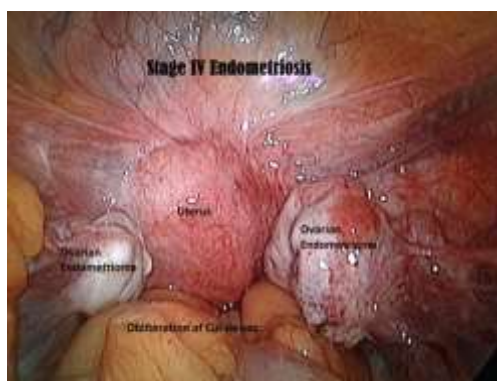


Figure 2: Showing ovarian endometrioma, obliteration of cul-de sac with peritoneal adhesions (stage IV).

CONCLUSIONS

Patients with symptoms of dysmenorrhoea, dyspareunia, pelvic pain, infertility and clinical signs of cul-de-sac tenderness with nodular surface, restricted mobility of uterus or fixed retroverted uterus with adnexal mass along with USG findings should raise the suspicion of endometriosis in infertility patients. In infertile patients with stage III/IV endometriosis, surgical management can be recommended for better results in fertility rates. Patients with stage 1 and 2 disease also benefit after operative surgery. The diagnostic and therapeutic dilemma of endometriosis in infertility patients can be solved by laparoscopy. Laparoscopy remains the gold standard for diagnosing the disease; staging and surgically managing such cases.

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