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Research Article

Combined hysterolaparoscopy as an early option for initial evaluation of female infertility: a retrospective study of 135 patients

Jasmina Begum*, Sunita Samal, Seetesh Ghose, Pallavee Palai, Rupal Samal

Department of Obstetrics and Gynecology, Mahatma Gandhi Medical College and Research Institute, Puducherry-607402, India

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***Correspondence:**
Dr. Jasmina Begum,
E-mail: jasminaaly@gmail.com

ABSTRACT

Background: The aim of this study was to find out different causes of female infertility with diagnostic approach using laparoscopy and hysteroscopy.
Methods: This retrospective study was done in the Department of Obstetrics and Gynecology of MGMCRI, Puducherry. 135 infertile women aged 19-40 years were enrolled retrospectively for combined laparoscopy and hysteroscopy. These infertile women were confirmed to have normal ovulatory cycles, hormonal assays and seminogram report. Patient with active genital tract infection and any contraindication to hysterolaparoscopy procedure were excluded. Dye studies as well as inspection for abnormal pelvic and intrauterine pathology and necessary therapeutic interventions were done during the procedure. Abnormal pelvic and intrauterine pathology by hysterolaparoscopy were categorized. Data was statistically analyzed using SPSS software version 15; a result of P <0.05 was considered as significant.
Results: Out of 135 cases, 65% patients had primary and 34.8% patients had secondary infertility. As a whole pelvic pathology were confirmed in 54.5% and intrauterine pathology in 20.7% patients by hysterolaparoscopy. The most common laparoscopic abnormality detected was tubal pathology 40%, followed by pelvic inflammatory disease 18.5%, ovarian pathology 8.1% pelvic endometriosis 4.4%, and uterine pathology 4.4% in infertile patients. In hysteroscopy, the incidence of uterine anomaly was 9.6% and intrauterine septum is the most common anomaly with a mean incidence of approximately 84% in both the group of infertile patients.
Conclusions: Hysterolaparoscopy is an effective diagnostic tool for evaluation of certain significant and correctable abnormalities in pelvis, tubes and the uterus which are usually missed by other imaging modalities.

Keywords: Hysteroscopy, Laparoscopy, Infertility

INTRODUCTION

Infertility is defined as failure to conceive during one year of unprotected frequent intercourse. It affects approximately 10-15% of couples. Leading cause of infertility includes tuboperitoneal disease (40 -50%), ovulatory disorders (30-40%), uterine factor (15-20%), and male factor infertility (30-40%).[1,2] Less invasive diagnostic tests such as patient's history, pelvic sonography, hysterosalphingography, chylamydia antibodies testing are available but it is still matter of debate how the value of these tests can be compared with hysterolaparoscopy in work up for infertility. Infertile women with normal ovulatory cycles, normal sonography and normal seminogram reports, subtle endometrial changes and tuboperitoneal pathology can highly influence fertility. Hysterolaparoscopy is an excellent

diagnostic modality to detect hidden pathology in patients without any overt clinical manifestations. Diagnostic hysterolaparoscopy is a modality for long standing infertile cases and not for early infertile cases. Laparoscopy can reveal the presence of peritubal adhesion, periadnexal adhesion, tubal pathology and endometriosis in 35-68% of cases even after normal HSG.[1]Diagnostic hysteroscopy is an equally important modality of investigation for female infertility.[3]

Keeping this in view, the present study was designed to assess the role of hysterolaparoscopy in comprehensive work up of infertility, which would help in planning appropriate management.

METHODS

This study was conducted in the department of Obstetrics and Gynecology in a tertiary care hospital from January 2011 to December 2013 retrospectively. All the infertile patients who underwent diagnostic hysterolaparoscopy in the above mentioned period fulfilling the following criteria were included in this study, 1) women aged 19-40 years 2) primary or secondary infertility as per WHO criterion 3) confirmed ovulatory cycle based on premenstrual endometrial biopsy and also by normal serum level of TSH, FSH, LH, prolactin, progesterone 4) normal seminogram. The data collected were demographic factors such as age, duration and type of infertility, premenstrual endometrial biopsy report and mid luteal progesterone level to confirm ovulatory cycle, base line hormonal profile and records of male evaluation. Intraoperative finding, surgical interventions and complications during procedure were noted. The following parameters such as tubal occlusion, peritubal, periadnexal and dense pelvic adhesions, endometriosis, enlarged ovary or ovarian cyst during laparoscopy and abnormality of cervical canal, uterine cavity, bilateral tubal ostium and endometrium during hysteroscopy were noted. Data was statistically analyzed using SPSS software version 15; values were expressed as percentages, mean ± SD and statistically analysis was performed by Fisher's test. A result of P <0.05 was considered as significant.

RESULTS

Out of 135 patients, who fulfilled the eligibility criteria, 88 (65%) women had primary infertility and 47 (34.8%) had secondary infertility. The mean age of the patients in secondary infertility group were 28.21 ± 3.66 years. The patients in secondary infertility group were older compared to primary infertility group having mean age of 21.21 ± 6.68 years. The P value is less than 0.0001 this difference is statistically significant.

The mean duration of infertility in primary and secondary group were 3.44 ± 1.95 years and 4.66 ± 2.29 years, the P value is equals to 0.0014 and the difference is also significant.

In primary infertility group 48 (54.5%) patients had abnormal findings. Laparoscopy alone detected pelvic abnormalities which were seen in 33 (68.7%) patients. Hysteroscopy alone detected intrauterine abnormalities in 3 (6.25%) patients. About 12 (25%) patients had combined intrauterine and pelvic abnormalities by both laparoscopic and hysteroscopic examination. In secondary infertility group 28 (59.5%) patients had abnormal findings. Similar to primary infertility group, laparoscopy alone detected abnormalities which was seen in 15 (31.9%) patients, hysteroscopy alone abnormalities seen in 4 (8.5%) patients and 9 (19.1%) patients had combined intrauterine and pelvic abnormalities by both laparoscopic and hysteroscopic examination. None of the above values between primary and secondary infertility were statistically significant (Table 1).

Table 1: Prevalence of laparoscopy, hysteroscopy and combined hysteroscopy and laparoscopy abnormalities.

Procedures	Primary infertility (88)	Secondary infertility (47)	P value
Laparoscopy	33 (37.5%)	15 (31.9%)	0.575 (0.417)
Hysteroscopy	3 (3.4%)	4 (8.5%)	0.237 (1.622)
Combined hysteroscopy & laparoscopy	12 (13.6%)	9 (19.1%)	0.458 (0.709)
Total abnormal cases	48 (54.5%)	28 (59.5%)	

Laparoscopy revealed abnormal findings in 45(51.1%) patients of primary infertility and 24 (51%) patients of secondary infertility. Tubal occlusion was seen in 54 (40%) patients whereas pelvic inflammatory disease was seen in 25 (18.5%) patients. About 11 (8.1%) patients had ovarian pathology. Six (4.4%) patients had endometriosis and 6 (4.4%) patients had distorted uterus. None of the values between primary and secondary infertility were statistically significant (Table 2).

Tubal block was seen in 36 (40.9%) primary and 18 (38.2%) secondary infertility cases. These were not statistically significant (Table 3).

Among women with primary infertility, intrauterine pathologies were diagnosed in 15 (17.04%) cases. The congenital malformations were found in 8 (53.3%) cases out of which septate uterus was seen in 6 cases. The acquired intrauterine pathologies were diagnosed in 7 (46.6%) cases. Considering the group with secondary infertility, intrauterine pathologies were diagnosed in 13 (27.65%) cases. The congenital uterine malformations were found in 5 (38.4%) cases, all had uterine septum. The acquired intrauterine pathologies were diagnosed in 8 (61.5%) cases. Hysteroscopic findings are also comparable between both the groups (Table 4).

Table 2: Laparoscopy findings occurred alone or in combination.

Findings	Primary infertility 88 (65%)	Secondary infertility 47 (34.5%)	Total cases 135	P value
Tubal block	36 (40.9)	18 (38.2)		
Tubal block without adhesions	21	11		
Tubal block with adhesions	3	5	54 (40%)	0.854
Tubal block with TO mass	10	1		
Tubal block with endometriosis	2	1		
Ovarian pathology	8 (9)	3 (6.38)		
Polycystic ovaries	4	3	11 (8.1%)	0.747
Simple ovarian cyst	4	0		
Pelvic inflammatory disease	14 (16.9)	11 (23.4)		
Pelvic adhesions	7	7		
Pelvic adhesions with TO mass	6	3	25 (18.5%)	0.353
Pelvic tuberculosis with beaded tubes	1	1		
Endometriosis	3 (3.4)	3 (6.38)		
Endometriosis of ovary	1	2	6 (4.4%)	0.419
Pelvic endometriosis	2	1		
Uterine pathology	2 (2.2)	4 (8.5)		
Distorted uterus by fibroid	1	3	6 (4.4%)	0.182
Distorted uterus by adhesions	1	1		

Table 3: Prevalence of tubal block by laparoscopic chromopertubation.

Finding	Primary infertility (88)	Secondary infertility (47)	Total cases (135)	P value
Unilateral block	10	6	16 (11.8%)	0.787
Bilateral block	26	12	38 (28.1%)	0.691
Total	36 (40.9%)	18 (38.2%)	54 (40%)	

Table 4: Hysteroscopy findings occurred alone or in combination.

Findings (%)	Primary infertility (88)	Secondary infertility (47)	Total cases	P value
Uterine anomaly	8 (53.3%)	5 (38.4%)	13 (9.6%)	0.767
Myoma / Polyp	4 (26.6%)	3 (23%)	7 (5.1%)	0.694
Synechiae	1 (6.6%)	4 (30.7%)	5 (3.7%)	0.050
Blocked / Fibrosed Ostium	3 (20%)	4 (30.7%)	7 (5.1%)	0.237
Foreign body with irregular endometrium	0	1 (1.1%)	1 (<1%)	0.348

DISCUSSION

Infertile women with normal ovulatory cycles, seminogram and hormonal profiles have higher possibility of having tuboperitoneal and subtle endometrial pathologies. These women undergo emotional and financial trauma with anxiety while undergoing series of procedures like HSG, receiving treatment for timing ovulation with coitus, controlled ovulation stimulation with follicular tracing by transvaginal ultrasound, laparoscopy and hysteroscopy over a period of time before being referred for ART. Performing hysterolaparoscopy as single step procedure straightway in these may be more productive. Hysterolaparoscopy may initially appear to be expensive, invasive and require anaesthesia but subsequently, it may prove to be more fruitful as therapeutic interventions or early decisions for ART or both can be undertaken simultaneously.

Diagnostic hysteroscopy is also a proven method for investigating the cause of female infertility. Uterine pathologies can be the contributing factor for infertility in as many as 15% of couples seeking treatment and are diagnosed in as many as 50% of infertile patients.[4-7] Association of congenital uterine anomalies with pregnancy loss and obstetrics complications have been

seen for a long time but the ability to conceive is generally not affected.

Mean prevalence of uterine malformation in general population and in the population of fertile women is approximately 4.3%, in infertile patients 3.5% and in patients with recurrent pregnancy losses approximately 13%.[8] Septate uterus is the most common uterine anomaly with a mean incidence of approximately 37.15% followed by bicornuate uterus approximately 26.13% and arcuate uterus approximately 21.26% of uterine anomaly in infertile couple.[9] Our study shows that the incidence of uterine anomaly was 13 (9.6%), septate uterus is the most common anomaly with a mean incidence of approximately 11 (84%) followed by bicornuate uterus 1 (7.6%) and cervical stenosis 1 (7.6%). Septate uterus has been recognized as most common cause associated with highest reproductive failure rates. The reproductive performance of women with an uncorrected septum is rather poor, as 65% losses occur in the first trimester.[10] Pregnancy outcomes also dramatically improve after surgical correction of septate uterus with 80% term delivery, 5% preterm delivery and 15% pregnancy loss.[11] Operative hysteroscopy technique which is performed as a day care procedure nowadays is recommended for septal resection as it carries a low morbidity. Our study also revealed myoma and polyp in 7 (5.1%), synechia in 5 (3.7%), blocked or fibrosed ostium in 7 (5.1%), foreign bodies with irregular endometrium in 1(0.74%) infertile patients. In infertile patients about 20% of hysteroscopic examination shows some grade of intrauterine abnormalities.[11] This is at par with our study 20.7% (28/135). In a study comparing hysteroscopy with HSG, the latter showed a false negative rate of 12% and the complication rate of diagnostic hysteroscopy can be as low as 0.012%.[12,13]

Laparoscopy is extremely useful in decision making while dealing with infertility of prolonged duration and older women.[14] In a retrospective study of 495 infertile women with unexplained infertility, laparoscopy before starting treatment revealed a significant incidence of abnormalities resulting a changed in decision.[15] Similarly when patients with unexplained infertility following standard infertility screening tests underwent diagnostic laparoscopy, 21-68% of these patients were found to have pathologic abnormalities which included endometriosis and tubal disease.[14,16,17] Our results at laparoscopy and dye studies had shown bilateral tubal patency in 79 (58.5%), bilateral tubal block in 38 (28.1%) and unilateral tubal block in 16 (11.8%) of infertile patients. In three patients because of cervical stenosis and suspected tuberculosis, laparoscopic dye study was not done. In one study at laparoscopy, bilateral tubal patency was demonstrated in 86.67%, bilateral tubal block in 5% and unilateral block in 8.33% of patients.[9] We got nearly equal prevalence of tubal block in primary infertility patients (40.9%) and secondary infertility patients (38.2%) which was similar to study done by Nayak KP et al.[18] In our study pelvic pathology by laparoscopy was confirmed in 54.5% of our cases, which was similar to other studies.[16,17] In the present study, tubal block was the most common pathology (40%), followed by pelvic inflammatory disease (18.5%). Ovarian pathology comprised 8.1% whereas pelvic endometriosis 4.4% and distorted uterus was also 4.4% of infertile cases diagnosed by laparoscopy.

Thus, diagnostic laparoscopy is the standard means of diagnosing the tubal pathology, peritoneal factors, ovarian factors and uterine factors as cause of infertility. In a comparative study between HSG and laparoscopy done by La Sala et al. for evaluation of tuboperitoneal factors had shown a false negative rate 35.5% and false positive rate of 37.7% for HSG and Snowden et al also in their study obtained the false negative rate of 13% and false positive rate of 16% for HSG.[19] Treatment modalities at the time of laparoscopy comprised of adhesiolysis, ablation of endometriosis, ovarian drilling and ovarian cystectomy. Hysteroscopic interventions were proximal tubal cannulation, septoplasty, synecolysis and myomectomy. Infertile cases with unilateral tubal block were advised further treatment in the form of superovulation with IUI for 3-6 cycles. Hysterlaparoscopy detected, 20 cases of uncorrected bilateral tubal block and 14 cases of severe grade of pelvic disease with bilateral tubal block who were referred for IVF-ET without any further delay. Women with corrected pathologies in hysterolaparoscopy were given trials for spontaneous conception for a period of 6 months.

As a whole, pelvic pathologies were confirmed in 54.5% of patients and intrauterine pathologies in 20.7% of patients by simultaneous diagnostic hysterolaparoscopy. With the view of the low complication rate, minimal time requirements, dealing the abnormal finding therapeutically at the same sitting, a negligible effect in the postoperative course and significant advantage over HSG, hysterolaparoscopy should be carried in all patients to look for tubal and pelvic cause of infertility when all other examinations performed were normal.

CONCLUSION

It can be concluded that diagnostic hysterolaparoscopy is effective and safe tool in evaluation of all infertile patients to look for tubal or pelvic cause of infertility when all other examinations performed were normal. It will also be possible in formulating a specific plan of management and segregate the patients who will need ART at the earliest, thus avoiding further emotional and financial trauma to the couples. Our study is retrospective in nature with limited sample size hence we suggest more studies in this aspect of infertility.

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