Role of Hysterolaparoscopy in Infertility

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ABSTRACT

Introduction: Hysterolaparoscopy often brings to light the hitherto unexpected pathology. The objective of this study was to evaluate various etiological factors in infertility by hysterolaparoscopy and to evaluate therapeutic interventions done during hysterolaparoscopy.

Materials and methods: Women posted for hysterolaparoscopy for infertility workup in JSS hospital during the period from November 01, 2014, to October 31, 2016, were included in the study. First hysteroscopy was performed. In hysteroscopy, endocervical canal was visualized for any growth or polyps. Diagnostic laparoscopy was performed using a 30-degree deflection angle telescope powered with a fiber-optic cable for light source.

Results: On hysteroscopy, out of 90 cases, 68 (75.6%) had normal findings, 10 (11.1%) had endometrial polyps, 5 (5.6%) had septate uterus, 3 (3.3%) had hyperplastic endometrium, and there was 1 case each of submucous fibroid, atrophic endometrium, intrauterine adhesions, and hypoplastic uterus. Laparoscopic interventions were performed in the form of ovarian cystectomy in 17 (18.8%), paraovarian cystectomy in 3 (3.3%), adhesiolysis in 2 (2.2%) cases, drilling of polycystic ovaries in 26 (28.8%) cases, fulguration or excision of endometriosis nodules in 4 (4.4%), myomectomy in 7 (7.7%) cases, fimbrial cystectomy in 2 (2.22%), and unilateral salpingectomy done in 2 (2.22%).

Conclusion: Hysterolaparoscopy is an effective and safe tool in comprehensive evaluation of infertility to diagnose and treat the various pathological conditions in a single sitting.

Keywords: Hysterolaparoscopy, Infertility, Pathological conditions, Uterus.

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INTRODUCTION

Infertility affects about 10–15% of reproductive-age couples. Although the prevalence of infertility is believed to have remained relatively stable during past 40 years, the demand for evaluation and infertility treatment has increased.^{1,2}

Majority of pelvic pathology is frequently not well appreciated by routine pelvic examinations and the usual diagnostic procedures. Hysterolaparoscopy becomes the “third eye” of the gynecologist in diagnosis of infertility. Laparoscopy and hysteroscopy can be used for both diagnostic and operative purposes.

Laparoscopy is considered the gold standard for diagnosing tubal and peritoneal disease. It has got an advantage of direct visualization of the pelvic organs and the peritubal status, which provides greater information when compared to hysterosalpingography and ultrasonography.

Hysteroscopy has become the gold standard for diagnosis of intrauterine abnormalities. Small intrauterine lesions such as adhesions, polyps, or submucous myomas are diagnosed much more precisely by hysteroscopy.

The question of tubal morphology and patency, ovarian morphology, an unsuspected pelvic pathology, and uterine cavity abnormalities can all be resolved with accuracy at one session. Additionally, therapeutic procedures can also be done in the same sitting.

Hence, hysterolaparoscopy is an effective and safe tool in comprehensive evaluation of infertility to diagnose and treat the lesions of pelvis in the same time.²

MATERIALS AND METHODS

This cross-sectional study was done for a period of 2 years in Department of Obstetrics and Gynecology, JSS Medical College, Mysuru, from October 2014 to August 2016.

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Inclusion Criteria

Women with primary or secondary infertility admitted in JSS hospital for hysterolaparoscopy.

Exclusion Criteria

- Active pelvic infections
- Medical disorders which are contraindication for anesthesia

Prior to commencement of the study, ethical clearance was obtained from Human Ethics Committee. A total of 90 women aged between 18 years and 40 years with primary or secondary infertility willing for the infertility workup were included in study. A detailed medical history was taken in all cases. This was followed by a detailed medical examination and relevant examination of the husband. Patients satisfying the selection criteria were informed in detail about the nature of study, and a written informed consent was obtained prior to procedure. After admission, demographic data such as age, religion, education, and socioeconomic status

were obtained. A detailed history and clinical examination was done. The scheduled investigations were done to determine fitness for surgery. Patient was admitted one day prior to the procedure, and preanesthetic checkup was done. Hysterolaparoscopy was scheduled in preovulatory period between day 5 and day 10 of cycle for infertility evaluation after informed consent (Figs 1 and 2).

Hysterolaparoscopy was done under general anesthesia. First hysteroscopy was performed. In hysteroscopy, endocervical canal was visualized for any growth or polyps. Uterine cavity was examined for the presence of septum, any congenital malformation, fibrotic bands, polyps, myomas, endometrial appearance, thickness, and color. Both the tubal ostia were visualized.

Diagnostic laparoscopy was performed using a 30-degree deflection angle telescope powered with a fiber-optic cable for light source. Panoramic view of the abdomen was obtained. Stepwise evaluation was made in the following manner:

General

To start with a general assessment of peritoneal cavity, especially the lower part of abdomen and pelvis was made to note any obvious pathology in the form of adhesions, endometriosis, or any gross deviations from the normal appearance.

Uterus, tubes and ovaries: The size and shape of the uterus was recorded. Any apparent congenital malformations such as arcuate uterus, bicornuate uterus, or rudimentary uterine horn were looked for and recorded. If any adhesions existed between the uterus, adnexae, omentum etc., they were recorded. Tubes were identified by tracing them from cornual end to fimbrial end. Apparent tortuosity of the tubes, any pathology affecting or involving the tubes was looked for and recorded. In cases where anatomy was distorted, round ligament was visualized first and tubes were traced. With respect to ovaries, size, shape, surface, color, presence of cysts and relation with tubes was noted.

Pelvic peritoneum including pouch of Douglas: Any pathology in the form of endometriosis, pelvic inflammation, and presence of fluid was recorded when seen.

Laparoscopic chromopertubation was performed for testing tubal patency in which methylene blue dye was injected with a 20-ml syringe via Leech Wilkinson cannula intracervically, and spillage of dye from the fimbrial end of tube was visualized.

Surgical interventions were carried out whenever required during the procedure which included hysteroscopy interventions, such as intrauterine adhesiolysis, hysteroscopic polypectomy, hysteroscopy septal resection, endometrial curettage, tubal

cannulation, hysteroscopic sub mucosal fibroid resection, etc., and laparoscopic interventions, such as ovarian drilling, ovarian cyst excision, fulguration of endometriotic lesions, laparoscopic myomectomy, etc. Patients were kept for a period of 24 hours in the hospital postoperatively.

RESULTS

Out of 90 subjects, 66 (73.3%) had primary infertility and 24 (26.7%) had secondary infertility. The age distribution of these two groups is shown in Table 1.

Out of 90 cases studied, 68 (75.6%) had normal findings, 10 (11.1%) had endometrial polyps, 1 (1.1%) had submucous fibroid, 5 (5.6%) had septate uterus, 3 (3.3%) had hyperplastic endometrium, and 1 each had atrophic endometrium, intrauterine adhesions, and hypoplastic uterus, respectively (Table 2).

Laparoscopic findings of uterus in 90 cases for infertility findings were as follows: 74 (78.8%) of them had normal findings, 12 (13.3%) of them had fibroid uterus, and 1 (1.1%) each had unicornuate uterus and hypoplastic uterus (Table 3).

Laparoscopic findings of pelvic pathology showed endometriosis in 27 cases of which minimal endometriosis was seen in 10 (32.3%), mild in 6 (19.4%), moderate in 9 (29%), and severe in 2 (6.5%) cases. Four (12.9%) of them had omental adhesions (Table 4).

Seventy-four (60%) of them had normal fallopian tubes. Pathological findings included peritubal adhesions, hydrosalpinx, tortuosity, stretching and kinking of tubes, tubo-ovarian mass, hematosalpinx, and absent tubes. One of the tubes could not be visualized due to adhesions in 4 cases (Table 5).

Laparoscopic findings of ovaries are depicted in Table 6. Polycystic ovaries were seen in 30% of cases, and endometriotic cyst was noted in 11 cases. Ovaries could not be visualized due to adhesions in four cases.

Chromopertubation findings of 90 cases showed bilateral spillage in 67 (74.4 %) patients. Unilateral spillage was seen in 15 (16.7%), and there was tubal block in 8 (8.9%) cases (Table 7).

Laparoscopic interventions were performed in the form of ovarian cystectomy in 17 (18.8%), paraovarian cystectomy in 3 (3.3%), adhesiolysis in 2 (2.2%) cases, drilling of polycystic ovaries in 26 (28.8%) cases, fulguration or excision of endometriosis nodules in 4 (4.4%), myomectomy in 7 (7.7%) cases, fimbrial cystectomy in 2 (2.22%), and unilateral salpingectomy done in 2 (2.22%) (Table 8).

Figs 1A to C: Hysteroscopy images

Figs 2A to H: Laparoscopy images

Hysteroscopic interventions were performed in the form of curettage in 08 (33.3%), hysteroscopic cannulation in 2 (8.3%), polypectomy and septal resection in 5 (20.8%) cases each, submucosal fibroid resection in 1 (4.2%) case, and tubal block released in 2 (8.3%) (Table 9).

DISCUSSION

The present study was a cross-sectional study done for period of 2 years in Department of Obstetrics and Gynecology, JSS Medical College, Mysuru, from October 2014 to August 2016. In our study,

Table 1: Distribution according to age and type of infertility in the study subjects

Age group (in years)	Primary infertility (%)	Secondary infertility (%)	Total
<25	29 (78.4)	08 (21.6)	37 (41.1)
26–30	23 (67.6)	11 (32.4)	34 (37.8)
31–35	10 (66.7)	05 (33.3)	15 (16.7)
>35	04 (4.4)	0	04 (4.4)
Total	66 (73.3)	24 (26.7)	90 (100)

Table 2: Distribution according to hysteroscopy findings in the study subjects

Hysteroscopy	Number	Percentage
Normal	68	82.2
Endometrial polyps	10	11.1
Endometrium hyperplastic	03	03.3
Atropic endometrium	01	01.1
Hypoplastic uterus	01	01.1
Partial septum present	05	05.6
Submucous fibroid	01	01.1
Intrauterine adhesions	01	01.1
Total	90	100.0

Table 3: Distribution according to laparoscopic findings in uterus among the study subjects

Laparoscopic findings in uterus	Number	Percentage
Normal	74	82.2
Hypoplastic	01	1.1
Fibroids	12	13.3
Unicornuate	02	2.2
Bicornuate	01	1.1
Total	90	100.00

Table 4: Distribution according to laparoscopic pelvic pathology findings among the study subjects

Laparoscopic findings in pelvis	Number	Percentage
Endometriosis (minimal)	10	32.3
Endometriosis (mild)	06	19.4
Moderate endometriosis	09	29.0
Severe endometriosis	02	06.5
Omental adhesions	04	12.9
Total	31	100.0

out of 90 subjects, 66 (73.3%) were primary infertility and 24 (26.7%) were secondary infertility which is comparable to study by AM Elbareg et al.³

The commonest hysteroscopic uterine cavity abnormality was endometrial polyp seen in 10%. The same is observed in studies done by Zhang et al., Nayak et al., and Elbareg et al.^{3–5}

The second most common hysteroscopic uterine cavity abnormality in our study was septate uterus which was similar to study by Nayak et al.,⁵ where septate uterus was found at higher incidence of 10% in their study (Tables 7 to 9).

Table 5: Distribution according to laparoscopic finding of fallopian tubes in the study subjects

Findings	Right tube		Left tube	
	Number	Percentage	Number	Percentage
Normal	74	60.0	70	54.5
Peritubal adhesions	04	10.0	06	13.6
Tubo-ovarian mass	–	–	01	02.3
Hydrosalpinx	02	05.0	02	04.5
Hematosalpinx	01	02.5	–	–
Kinking	01	02.5	–	–
Tortuous	02	05.0	02	04.5
Stretched tubes	02	05.0	04	09.1
Fimbrial cyst	02	05.0	–	–
Not visualized due to adhesions	01	02.5	03	06.8
Absent tubes	01	02.5	02	04.5
Total	90	100.0	90	100.0

Table 6: Distribution according to laparoscopic findings of ovaries in the study subjects

Findings	Right ovary		Left ovary	
	Number	Percentage	Number	Percentage
Normal	41	45.6	45	50.0
Polycystic ovaries	27	30.0	27	30.0
Endometriotic cyst	09	10.0	02	02.2
Ovarian cyst	07	07.8	07	07.8
Adhesions	02	02.2	07	07.8
Paraovarian cyst	01	01.1	01	01.1
Could not be visualized	03	03.3	01	01.1
Total	90	100.0	90	100.0

In a study by Elbareg et al.,³ significant hysteroscopy findings were noted in 50% of cases, and in our study significant findings were noted in 24.4 %.

It has been associated with increased miscarriage rates, but there is no evidence of lower pregnancy rates.³

In our study, polypectomy was done in 5.55% cases which are comparable to study by Keya Vaid et al.⁶

In our study, tubal cannulation was performed hysteroscopically in 2 (2.2%) cases out of 90 cases, compared to Keya et al., where hysteroscopic cannulation was performed in 8%.

Laparoscopy with concurrent chromopertubation is considered as gold standard for diagnosing tubal functions. Hei et al. found that 6.04% had bilateral tubal occlusion, and 5.69% had unilateral tubal occlusion.⁷

In our study, 8.9% had bilateral tubal occlusion, 16.7% had unilateral tubal occlusion, and bilateral tubal patency was demonstrated in 74.4%. In a study by Godinjak Z, bilateral tubal patency was demonstrated in 86.67%, bilateral tubal block in 5%, and unilateral block in 8.33% of patients.⁸

In our study, laparoscopic findings of uterus were as follows: 74 (78.9%) of them had normal study, 12 (13.3%) of them had

Table 7: Distribution according to chromoperturbation findings in the study subjects

Findings	Number	Percentage
Normal	67	74.4
Unilateral block	15	16.7
Bilateral block	08	08.9
Total	90	100.0

Table 8: Distribution according to laparoscopic interventions in the study subjects

Laparoscopic interventions	Number	Percentage
Diagnostic	27	30
Ovarian cystectomy	17	18.8
Paraovarian cystectomy	03	3.3
Ovarian drilling	26	28.8
Adhesiolysis	02	2.22
Myomectomy	07	7.77
Fimbrial cystectomy	02	2.22
Fulguration of endometriotic spots	04	4.44
Unilateral salpingectomy	02	2.22
Total	90	100

Table 9: Distribution according to hysteroscopic interventions in the study subjects

Hysteroscopic interventions	Number	Percentage
Diagnostic	66	66.6
Curettage	08	8.8
Hysteroscopic cannulation	02	2.2
Polpectomy	05	5.5
Septal resection	05	5.5
Submucosal fibroid resection	01	1.1
Tubal block released	02	2.2
Adhesiolysis	01	1.1
Total	90	100.0

fibroid uterus, 5 (20.8%) had septate uterus, 1 (1.1%) each had unicornuate uterus and hypoplastic uterus. Mullerian anomalies were comparatively more in our study when compared to Suman et al. which had 4% congenital anomalies.

Our study revealed myomas in 13.3 % patients on laparoscopy and 1.1% on hysteroscopy which is comparable to study by Zhan et al.⁴ which revealed myomas in 15%. Also in a review by Pritts et al.,⁹ they found that fibroids causing intracavitary distortion result in decreased pregnancy rates.^{4,9}

In our study, 60% of the cases had normal fallopian tubes, and most common pathological finding was hydrosalpinx seen in 5%, compared to Keya vaid et al.⁶ Hydrosalpinx was observed in 2.59%; however, most common pathology in their study were fimbrial cyst 9.84%. Other pathology in tubes found in our study were as follows: 6 (13.6%) had peritubal adhesions, 2 (5%) had

tortuous, stretched, and kinking tubes and 1 each (2.5%) had tubo-ovarian mass, hematosalpinx, absent tubes, and tube could not be visualized in 1 case (2.5%).⁶

In the study done by Shobha Dhananjay et al.,¹⁰ PCOS was the commonest finding noted in 18.99% similar to our study. The other more commonly seen pathology in ovary in our study was endometriomas with incidence of 12.6%.

The surgical removal of endometriotic implants in minimal-mild severity endometriosis was shown to improve fertility in two randomized controlled studies. Thus, all patients with endometriosis should have all visible implants excised during laparoscopic diagnosis. According to Adamson, in the more severe stages of endometriosis, a surgical approach that normalizes pelvic anatomic distortion and provides adhesiolysis can enhance fertility.^{11,12}

In our study, endometriosis was seen in total of 27 cases which were subclassified according to ASRM criteria, and fulguration of endometriotic spots was performed in 4 (4.4%).⁶ Endometrioma resection was done in 12.2%.

CONCLUSION

Based on results of this study it be concluded that hysterolaparoscopy is an effective and safe tool in comprehensive evaluation of infertility to diagnose and treat the various pathological conditions in the same time. Hence, it is an essential tool for the diagnosis, treatment, and prognosis, as it allows the gynecologist to develop the plan of management for infertile women.

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