

Original Research Article

Role of diagnostic hysteroscopy in the evaluation of female infertility

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ABSTRACT

Background: Infertility is defined by WHO as a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. The prevalence of infertility is about 10%-15% of reproductive age couples. Female factor is responsible for 40-45% of etiology of infertility. Aim of the study was to evaluate the role of diagnostic hysteroscopy in female infertility at a tertiary care centre.

Methods: This is a retrospective hospital based study done at a tertiary care hospital attached to JSS Medical College, Mysuru between January 2017 and December 2018. Infertile women with primary or secondary infertility in the 18-40 years age group, with normal hormonal profile and no known male factor were included.

Results: In our study, primary infertility was found in 77% of the 96 patients and secondary infertility was found in 23% of patients. In primary infertility, ovarian pathology was the most common finding while Endometriosis was the most common finding in secondary infertility group. 77 % patients were found to have bilaterally patent tubes while remaining had unilateral or bilateral blockage. On hysteroscopy, endometrial polyps were the commonest hysteroscopic finding in both groups.

Conclusions: Combined hystero-laparoscopy is a safe, effective and reliable method in comprehensive evaluation of infertility. It helps in the diagnosis of pelvic pathology which may have been missed by routine examination and thereby helps in optimal management of female infertility.

Keywords: Hysteroscopy, Infertility, Laparoscopy

INTRODUCTION

Infertility is a multidimensional health problem with social and economic consequences. Infertility is defined by WHO as a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.¹ The prevalence of infertility is about 10%-15% of reproductive age couples.¹ WHO also estimated that the prevalence of infertility ranges from 3.9% to 16.8% in India.¹ As per the estimates from Indian census

data 2001, 1991 and 1981, researchers showed that childlessness in India has risen up. In 1981, approximately 13 percent of ever-married women of reproductive age were childless, which increased to nearly 16 percent in 2001.²

Increasing lifestyle choices, stress and later age of marriage have made occurrence of Infertility higher than couple of decades ago.³ Female factor is responsible for 40-45% of etiology of infertility.⁴ In the past, people had little control over their fertility and couples that could not

get a child had no other choice but to accept the fact. In contrast, although today infertility is a relatively common problem, medical science has increased the chances of conceiving with assisted reproduction techniques.⁵

Accurate diagnosis is the first step towards a good treatment plan. Once the exact nature of the cause of infertility is identified, an optimal treatment plan can be individualized to meet the couples fertility goals.

It is often noticed that a large number of pelvic pathology goes unidentified or the exact nature of pathology remains unclear after routine clinical examination and basic investigations in the evaluation of female infertility. The ability to visualise the pelvic cavity, identify peritoneal factors, tubal morphology, patency, ovarian size, morphology, its relationship to the tubes, uterine size, shape and pathology through a laparoscope makes its use invaluable. Similarly, using a hysteroscope to visualise the uterine cavity and identify hitherto missed cavity abnormalities has made hysteroscopy an essential part of infertility evaluation. The additional advantage of correcting a few of the identified abnormalities by operative hysterolaparoscopic procedures makes this procedure an essential step in the comprehensive work up of female infertility. An understanding of the levels of infertility among couples is crucial in order to improve the clinical management of infertility.⁶

Our study was undertaken to understand the role of hysterolaparoscopy in accurately identifying pelvic pathology in the evaluation of female infertility and to note the pattern of various pathologies that are implicated in infertility.

METHODS

This is a retrospective hospital based study of women, who came to seek evaluation and treatment for infertility in the Gynaecology department of a tertiary care hospital attached to JSS Medical College in Mysuru City between January 2017 and December 2018. Case files and operation records in this duration were checked for the details of the patients who underwent diagnostic hysterolaparoscopy and 96 patients were considered for the study after they satisfied the inclusion and exclusion criteria.

Inclusion criteria

Infertile women with primary or secondary infertility of the age group 18-40 years. Primary infertility patients were those who had never conceived before, while secondary infertility patients had conceived before atleast once, irrespective of the outcome.

Exclusion criteria

- Infertile women with age less than 18years or more than 40years.

- Infertile women with abnormal hormonal profile (altered serum FSH, LH, TSH or prolactin),
- Couples with male infertility.

Hysterolaparoscopy was performed in early follicular phase of menstrual cycle under general anaesthesia. The tubal patency test was done in all cases of infertility. It was carried out under laparoscopic vision by introducing 10-15 ml of 0.5% autoclaved methylene blue dye into the uterus using a Rubin’s canula and spillage from fimbrial ends was noted. Wherever required, interventions were performed in the same sitting.

Statistical analysis of the data was done using software version SPSS 21.0. Categorical variables were expressed as proportions. Chi-square test was used to express categorical variables as proportions.

RESULTS

In our study, primary infertility was found in 74 (77%) of the 96 patients and secondary infertility was found in 22 patients (23%). Most patients in the primary infertility group were in the 25-30 yrs age group and understandably patients with secondary infertility were older and most of them were in the 30-35 yrs age group. In the primary infertility group, laparoscopic abnormalities were more common than hysteroscopic abnormalities, (65% vs 26%, P<0.0001). In secondary infertility group both hysteroscopy and laparoscopic abnormalities were similar (50% and 45%, P>0.0001) (Table 1).

Table 1: Findings in laparoscopy and hysteroscopy.

Procedure	Primary infertility		Secondary infertility	
	Normal (%)	Abnormal (%)	Normal (%)	Abnormal (%)
Laparoscopy	26 (35%)	48 (65%)	11 (50%)	11(50%)
Hysteroscopy	55 (74%)	19 (26%)	12 (55%)	10(45%)

In the primary infertility ovarian pathology was the most common finding in 23% of the patients. Ovarian pathology included 10 cases of ovarian cysts (not including endometriotic cysts), 5 cases of PCOS and 2 cases with small ovaries. The second highest abnormality was endometriosis which comprised 14 (19%) of the patients. Majority 7 (50%) of the endometriosis was diagnosed to be stage 1.

Tubal pathology and pelvic adhesions contributed to about 15% each and Myomas comprised 14%. 2 cases of uterine anomalies (unicornuate uterus with a Non communicating rudimentary horn and hypo plastic uterus) were noted and one case of abdominal tuberculosis was diagnosed on laparoscopy.

Endometriosis followed by pelvic adhesions were the most common abnormalities detected in laparoscopy in secondary infertility group. 11 (50%) of the 22 patients in the secondary infertility group were normal. Endometriosis was diagnosed in 18% of patients in this group and 9% had ovarian pathology. Similar to the primary infertility group, pelvic adhesions formed about 14% of cases. 2 cases of myomas and 1 case of tubal pathology were noted (Table 2).

Table 2: Laparoscopic findings in primary and secondary infertility.

Findings	Primary infertility	Secondary infertility	Total
Normal	26(35%)	11(50%)	37(39%)
Ovarian pathology	17(23%)	2 (9%)	19(20%)
Endometriosis	14(19%)	4(18%)	18(19%)
Tubal pathology	11(15%)	1(5%)	12(13%)
Adhesions	11(15%)	3(14%)	14(15%)
Myomas	10(14%)	2(9%)	12(13%)
Uterine anomalies	2(3%)	-	2(2%)
Abdominal TB	1(1%)	-	1(1%)

Chromopertubation was done in 95 of the 96 cases (1 case of abdominal TB was diagnosed on table and dye test was not performed). 59(79%) of the 74 primary infertility patients were found to have bilaterally patent tubes. 5(7%) of them had right sided block and 3(4%) of them had left sided block. (6)8% of them had bilaterally blocked tubes. In the secondary infertility group, 68% had patent tubes while (2)9% had blockage on both sides. 1 patient had right sided block and 4 patients had left sided tubal block. There was no significant difference in unilateral or bilateral tubal block between the primary and secondary infertility groups (Table 3).

Table 3: Chromopertubation findings in primary and secondary infertility.

Findings	Primary Infertility	Secondary Infertility	Total
B/L tubes patent	59(79%)	15(66%)	74(77%)
Right sided block	5(7%)	1(5%)	6(6%)
Left sided block	3(4%)	4(18%)	7(7%)
B/L block	6(8%)	2(9%)	8(8%)

On hysteroscopy, 55 of the 74 patients in primary infertility group were found to have normal study. 6 patients (8%) were diagnosed with endometrial polyps which were the commonest hysteroscopic finding in this group followed by uterine septum and sub septum (6%). Intrauterine adhesions were noted in 4% of the patients while obliterated ostium was noted in 1 patient. 1 patient had a Unicornuate uterus and 1 patient had a hypo plastic uterus. 45% patients with

secondary infertility were found to have abnormal hysteroscopic picture. Again endometrial polyps were the leading cause (18%) followed by intrauterine synechie in (14 %) cases. 2 cases of intrauterine septum were noted and 1 case of obliterated ostium was noted. Intrauterine adhesions were 14% in the secondary infertility group compared to 4% in the primary infertility group but it was statistically insignificant (Table 4).

Table 4: Hysteroscopic findings in primary and secondary infertility.

Findings	Primary infertility	Secondary infertility	Total
Normal	55(74%)	12(55%)	67(70%)
Endometrial polyp	6(8%)	4(18%)	10(10%)
Intrauterine adhesion	3(6%)	3(14%)	6(6%)
Septum/subseptum	5 (7%)	2(9%)	7(7%)
Obliterated ostium	1(1.5%)	1(4%)	2(3%)
Unicornuate uterus	1(1.5%)	-	1(1%)
Myoma	3(4%)	-	3(14%)
Hypoplastic uterus	1(1.5%)	-	1(2%)

DISCUSSION

In our study comprising 96 patients, a total of 62% of patients had abnormal laparoscopic findings and 30% of patients had abnormal hysteroscopic picture. Hysteroscopy offers a safe diagnostic and therapeutic alternative in the same sitting. Today the complication rate of hysteroscopic procedures has reduced significantly owing to better training, skills and anaesthetic techniques. When combined with laparoscopy, hysteroscopic procedures have a complication rate of about 2.35%.⁷ Apart from minimal bleeding and post procedure discomfort, no other complications were experienced by the patients in this study. The commonest finding was endometrial polyp which was 8% in primary infertility and 18% in secondary infertility patients. Other studies have found 5-10% incidence of endometrial polyps.⁸⁻¹⁰ The incidence of asymptomatic endometrial polyps was found to be between 10-30%.^{11,12} Though the exact mechanism by which polyps cause sub-fertility and pregnancy loss is unclear, proposed mechanisms include mechanical interference with sperm transport, embryo implantation or through intrauterine inflammation or altered production of endometrial receptivity factors. The presence of polyp may hinder implantation and cause infertility.¹³ In a study including 224 female infertility patients, pregnancy rates improved by 50% after polypectomy.¹⁴ All cases of endometrial polyps found in our study underwent polypectomy.

Apart from polyps, 4% of women with primary infertility had myomas. The association of infertility and myomas is rather weak when corrected for all other factors.¹⁵ Correction of submucous myomas and other myomas distorting the cavity was undertaken in few select patients

in our study. Septate and sub septate uterus formed the next group of abnormalities noted in our study comprising 6% and 9% of primary and secondary infertility patients. Different studies report a range of 5-50% depending on the centre.

Nayak PK et al have reported 10% incidence, 6% incidence in Nanaware SS et al and a higher 50% incidence in Kabadi YM et al.⁸⁻¹⁰ Practice Committee of the American Society for Reproductive Medicine in their 2016 guideline have mentioned that though there is insufficient evidence to conclude that a uterine septum is associated with infertility, there are several studies that indicate that hysteroscopic septum incision is associated with improved clinical pregnancy rates in women with infertility. So, in a patient with infertility, prior pregnancy loss, or poor obstetrical outcome it is reasonable to consider septum incision.¹⁶ Earlier abdominal procedures were done for septum correction, now advancement in operative hysteroscopy enables us to effectively do a septal resection as a day care procedure with minimal complications.⁷ Other hysteroscopic procedures apart from septal resection were polypectomy, submucous myoma resection, adhesiolysis and tubal cannulation. Thus, hysteroscopy provides both diagnostic and therapeutic advantage in the same sitting with minimal complications.

Laparoscopy gives a magnified view of the pelvis, thereby resolving questions about tubal and ovarian morphology, tubal adhesions and also tubal patency. Endometriosis and peritoneal adhesions distort the tubo-ovarian relationship and prevent the ovum pickup even though the tubes appear normal externally. Laparoscopy is the gold standard for diagnosis of these disorders and has the advantage of performing corrective surgery in the same sitting.

The most common finding on laparoscopy was ovarian pathology averaging to 23% in the primary infertility group and 9% in the secondary infertility group. Ovarian cysts and PCOS were majority of cases. Ramesh B et al reported 18% ovarian pathology in primary infertility group, Kabadi et al reported 15% and Nayak et al reported 8%.^{7,10,8} Since ours is a tertiary care centre in the city of Mysuru, cases of ovarian cysts were referred for laparoscopic treatment, which probably explains the slightly higher percentage of such cases in our study.

Endometriosis forms the next largest diagnosis with about 19% in both groups. Other studies in the region have reported similar incidence of 12-20%.^{7,8,10} We have used the most widely accepted ASRM 1996 classification system for endometriosis.¹⁷

In current clinical practice, a surgical procedure such as laparoscopy is required for a definitive diagnosis of endometriosis. Histologic evaluation is warranted whenever the diagnosis is not apparent on visual inspection at surgery.¹⁷ Studies suggested that 25% to

50% of infertile women have endometriosis and that 30% to 50% of women with endometriosis are infertile.¹⁸ Female age, duration of infertility, pelvic pain, and stage of endometriosis should be considered when formulating a management plan. The benefit of laparoscopic treatment of minimal or mild endometriosis is insufficient to recommend laparoscopy solely to increase the likelihood of pregnancy. When laparoscopy is performed for other indications, the surgeon may consider safely ablating or excising visible lesions of endometriosis.¹⁷ Further prospective randomised studies are required to quantify the effect of surgical treatment of endometriosis on pregnancy rates. Tubal disease is an important cause of infertility and needs to be evaluated before starting fertility treatment.¹⁹ Though hysterosalpingography and saline infusion sonography have been used for diagnosis with varying degrees of accuracy, laparoscopy and chromopertubation is the gold standard. Laparoscopy provides a general view of the pelvic organs and also helps to identify pelvic adhesions.¹⁹ Laparoscopy is an exceptional test that can determine fimbrial function in addition to the patency of tubes. In our study tubal pathology was found in 15% of women with primary infertility and 5% of women with secondary infertility.

Other studies like Nanaware S et al reported 43% tubal pathology whilst Nayak PK et al reported 8%.^{5,8} Our study reported 8% B/L block in the primary infertility group and 9% in secondary group in contrast with Nayak P et al reporting 12%, Nanaware S et al who reported 25% tubal block while Kabadi et al reported 20%.⁸⁻¹⁰ Fallopian tube obstruction is implicated to play a role in 12-33% of subfertile couples and hence assessment of its patency is crucial in the work up of an infertile couple.²⁰

CONCLUSION

Combined hystero-laparoscopy is a safe, effective and reliable method in comprehensive evaluation of infertility. It helps in the diagnosis of pelvic pathology which is missed by routine pelvic examinations and basic investigations done for evaluation of infertility. Hysteroscopy becomes the “Third eye of the Gynecologist” in diagnosing infertility and gives the added advantage of doing a therapeutic procedure in the same sitting. We conclude that combined hysteroscopy is one of the most important procedures in the evaluation of female infertility.

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