Original Article

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Role of Minimal Access Surgeries in the Management of Infertility: A Prospective Study

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Abstract

Introduction: Incidence of infertility in our country is between 10 to 15%. The cause of infertility attributable to female partner in about third of all cases. Hysteroscopy and laparoscopy has emerged as a very important tool in evaluation and management of female infertility factors. *Objective*: This study aims to understand the role of minimal access surgeries like hysteroscopy and laparoscopy in cases of primary and secondary infertility. *Materials and Methods*: A prospective study conducted in 116 female infertility patients.Patients were subjected to clinical examination and diagnostic tests. Hysteroscopy & Laparoscopy were carried out in the proliferative phase of the menstrual cycle. *Results*: Out of 116 cases, 74 (63.7%) patients had a primary infertility and the rest 42 (36.2%) patients had a secondary infertility. Significant laparoscopy findings detected in 82 (70.6%) cases while hysteroscopy detected abnormalities in 46 (39.6%) cases in both the groups. Laparoscopic findings were more common than hysteroscopy in primary and secondary infertility. On laparoscopy tubal pathology was the most common abnormality seen in the pelvis while uterine polyps were the most common hysteroscopic findings observed in both the groups. Fertility enhancing endoscopic procedures carried out in the same sitting. *Conclusion*: Hysteroscopy & laparoscopy was found to be very useful in cases of primary and secondary infertility. It helps in the evaluation ofsignificant and correctible pelvic pathology in female infertility patients.

Keywords: Hysteroscopy; Infertility; Laparoscopy.

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Introduction

Subfertility is distressing experience and most of the time associated with depression, anxiety and relationship problems. It is estimated that 10-15% of couples in India are infertile [1]. WHO (World Health Organization) defines infertility 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. Eighty percentage of the healthy women are able to achieve pregnancy in one year of conjugal life.

Identifying the cause of infertility is complex and after a standard evaluation 20-30% of couples will have no clearly identifiable cause of their infertility [2,3]. However, these estimates include couples in whichthe female partner may not have been thoroughly evaluated with minimal invasive gynecological surgeries like hysteroscopy & laparoscopy for pelvic pathology.

Laparoscopy with chromopertubation is viewed as the "gold standard" test for tubal assessment in many infertility centers [4-6]. Adding hysteroscopy to the procedure allows for concomitant evaluation of the intrauterine cavity and may identify congenital or endometrial abnormalities [5].

Primaryand secondary infertility patients may differ in their disease profile and its manifestation. Assessment of the various infertility factors in both the group can be effectively done with the help of minimal access surgeries. It has been estimated that using laparoscopy along with the hysteroscopy as a standard test for the evaluation of tubal function would reduce the apparent incidence of unexplained infertility in primaryand secondary infertility [7].

Aim

This study aims to understand the role of hysteroscopy & Laparoscopy in cases of primary & secondary infertility.

Material and Methods

This is a prospective study of 116 patients with history of primary and secondary infertility selected from tertiary care institute from Sept. 2015 to August 2017. The age group of the patients was between 20yrs to 40yrs. The subjects were fully informed and signed a study consent form.

Patients eligible for study inclusion had a thorough entry history and clinical evaluation. Basic infertility work up of the couple was done, which comprises ofdemographic data, a complete meticulous clinical examination, routine blood test, urine test, semen analysis, thyroid profile, serum prolactin level, HSG and pelvic ultrasonography.

Couples with abnormal semen analysis, having active lower genital infection and abnormal hormone profile were not included in this study. This procedure was carried out in the proliferative phase of the menstrual cycle under general anesthesia. Diagnostic hysteroscopy and laparoscopy with chromoper-tubationalong with necessary therapeutic interventions like adhesiolysis, septum resection, polypectomy etc. done in the same sitting. All hysteroscopic procedures done with 2.9 mm Bettochihysteroscopewith 6 fr operative instruments and bipolar resectoscope.

The data is expressed as mean ± SD for each group. The data was tested for normality. Inter-group comparison was done using unpaired t test and Mann-Whitney test for parametric and nonparametric data respectively. Categorical data was analysed using Fisher's exact test. The level of significance was considered at $p<0.05$. GraphPad InStat software version 3.06 (Graph Pad Software, Inc., California, US) was used for statistical analysis.

Results

Total 116 patients of infertility were included in the study. Out of 116 patients, 74 (63.7%) women presented with primary infertility and the rest 42 (36.2%) were presented with a secondary infertility.

Significant laparoscopy findings detected in 82(70.6%) cases while hysteroscopy detected abnormalities in 46 (39.6%) cases in both the groups. In primary and secondary infertility group, laparoscopic abnormalities were observed more frequently than hysteroscopy. (Fishers exact test, Table 1 & 2)

The patients in the secondary infertility group were slightly elder compared to primary groups.

(29.05 +/- 3.27, $P<0.05$,Mann –Whitney Test, $P<0.05$ Table 3)

There was no difference observed in the duration of infertility in the two groups. Most of the patients were having 2 to 5 years of duration of infertility. (Fishers Exact T test , Table 4)

Tubal pathology was the most common abnormalities detected in laparoscopy in both the primary and secondary groups (Figure 1). Tubal blockage seen in 22 cases (14 primary & 8 secondary infertility).

Total 18 cases of tubal blockage positively responded tohysteroscopic tubal cannulation procedure. There was no significant difference observed in primary and secondary group (Fisher's Exact test).

Table 1: Prevalence of hysteroscopy and laparoscopy abnormalities in primary infertility

Procedure	Primary (74)	
	Normal	Abnormal
Laparoscopy	20	54
Hysteroscopy	44	30
Total	64	84

Fisher's Exact Test was applied. There is significant difference between Laparoscopy and Hysteroscopy in detection of abnormal findings in patients of primary infertility.

Table 2: Prevalence of hysteroscopy and laparoscopy abnormalities in secondary infertility

Procedure	Secondary (42)	
	Normal	Abnormal
Laparoscopy	14	28
Hysteroscopy	26	16
Total	40	44

Fisher's Exact Test was applied. There is significant difference between Laparoscopy and Hysteroscopy in detection of abnormal findings in patients of secondary infertility.

Table 3: Comparison of age

Groups	N	Age
Primary Infertility	74	25.92 ±3.38
Secondary Infertility	42	29.05 ± 3.27*

* P<0.05, Mann-Whitney Test
There is significant difference in age between patients of primary and secondary infertility

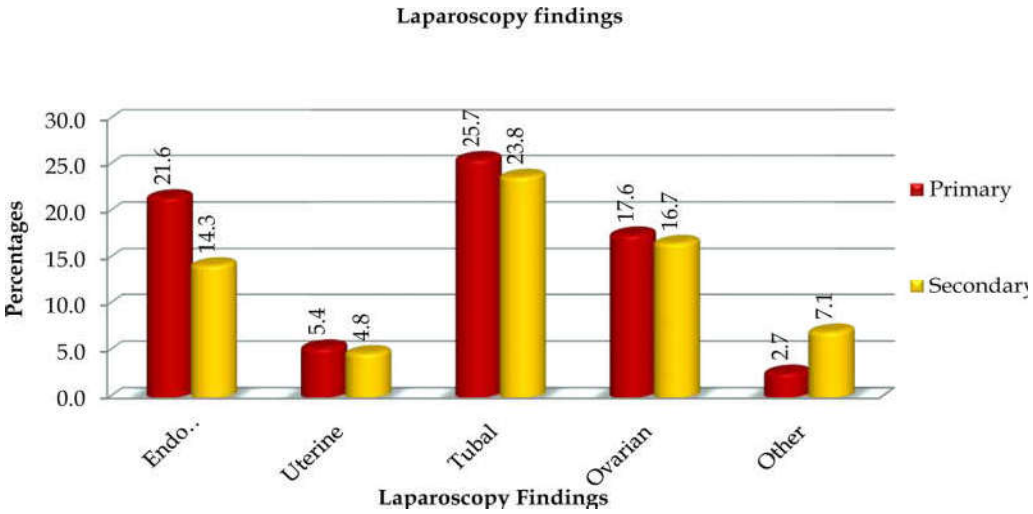

Fig. 1:

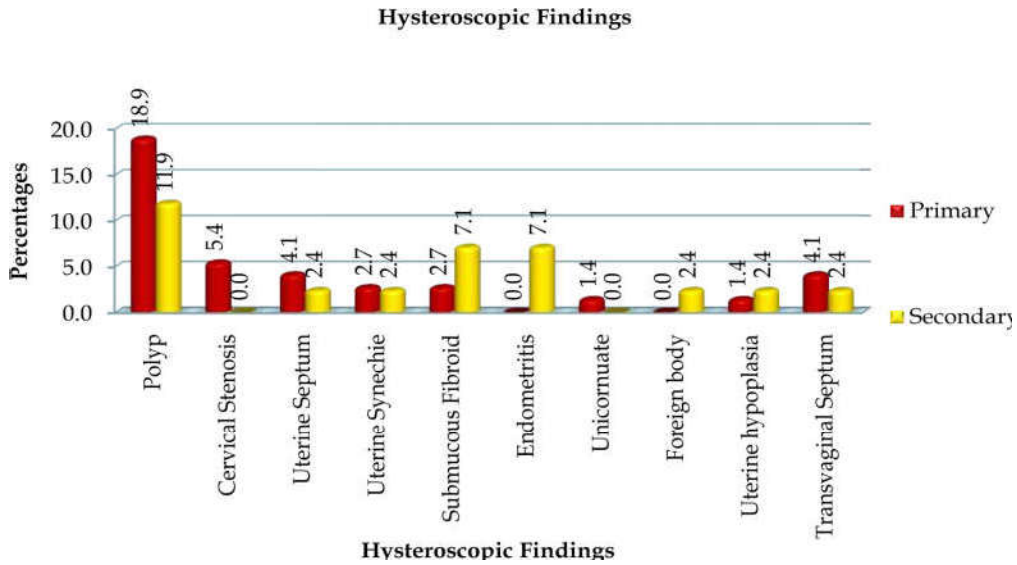

Fig. 2:

Table 4: Comparison of duration of infertility

Groups	<2 yrs	2 to 5yrs	5 or >5yrs
Primary Infertility	17	40	17
Secondary Infertility	13	16	13

Fisher's Exact Test was applied. There is no significant difference in duration of infertility between patients of primary and secondary infertility.

The most common hysteroscopicfindings in both the groups was intrauterine polyps. Other findings were submucous fibroids, transverse vaginal septum. Intrauterine septum etc. (Figure 2).

Discussion

The causes of infertility are broadly classified as male factors, female factors [8,9] and unknown. Female factor infertility can be divided intoseveral categories: uterine, ovarian, tubal, and other.A complete examination of a woman's internal pelvic structures certainly provide important information regarding infertility and common gynecologic disorders [10]. Some authors report that the predictive value of HSG is poor and its routine use in the fertility work-up should be reconsidered [11].

Laparoscopy is considered as the gold standard for diagnosing tubal and peritoneal disease. Laparoscopy often offers better visualization of deep structures in the pelvis. Other advantages arereduced postoperative pain, fewer wound complications, better cosmesis,less postoperative adhesions,shorter hospital stay and faster recovery. Hysteroscopy is the important tool for diagnostic & therapeutic evaluation of intrauterine pathology [12,13].

Intraoperative findings can guide postsurgical management. Surgically correcting endometriosis, uterine fibroids, uterine anomalies enhance the outcome in infertility patients [14].

The present study include116 cases of both primary and secondary infertility of which 74 cases enrolled in primary infertility while 42 cases werepresented with secondary infertility.

In our study, the mean age of casesof infertility was 25yrs. in primary and 29 yrs in a secondary infertility. In the present study, maximum number of infertile patients belonged to the age group of 25 to 30 years (68%); which was comparable with the study done by Malwadde et al [15].

Tubal and peritoneal pathology are among the most common infertility causes, with infertility being seen in approximately 30–35% of couples [16].

Tubal abnormalities include tubal obstruction, narrowing, dilatation,peritubal adhesions due to infection, inflammation, tuberculosis. Tubal disease with blockage involved the proximal (cornual) part, the mid part or the distal part. In the present study, tubal factor was the most common pathology (25%) seen in primary and secondary infertility group followed by endometriosis (19%) and ovarian pathology (17%) diagnosed on laparoscopy.

In our study tubal factor was responsible for 25% of the infertility which correlates with other studies by Goynumer G. et al. (24%) [17].

Our study also shows that bilateral tubal block to be the commonest cause in 16 cases (14%) of infertility due to tubal factor [18]. Fourteen cases were having proximal tubal blockage and 8cases were having mid and distal tubal blockage. Similar to the study conducted by Prasanta et al [19]. We got almost equal prevalence of tubal block in primary (18.9%) and secondary (19.4%) infertility groups.

Total 18cases (10 primary & 8 in secondary infertility group) of tubal blockage positively responded to tubal cannulation procedure in the present study. It indicates that tubal block still plays a major role in the aetiology of infertility. Diagnostic hysteroscopy and laparoscopy plays important role in complete assessment of female infertility and making treatment decisions according to the cause.

Endometriosis spans a spectrum from a single 1-mm peritoneal implant tolargerendometriomas with cul-de-sac obliteration [20]. In about 25-40% of infertile women have endometriosis [21].

In our study,endometriotic lesions seen in 22 (19%) cases. Stripping of endometriotic cyst, excision of the nodule and fulguration of endometriotic lesions were done with the help of bipolar scissors.

Abnormal intrauterine findings occur in approximately 34%-62% of infertile women [22].

The findings of our study were quite similar (35.3%) to other studies like that of MotyPansky et al [23].

In a present study intrauterine polyps were the most common hysteroscopic findings in primary and secondary infertility group. Endometrial polyps

significantly contribute to subfertility.Proposed theories are mechanical interference with sperm transport,intrauterine inflammation or altered production of endometrial receptivity factors.The prevalence of such unsuspected intrauterine abnormalities, diagnosed by hysteroscopy has been described to be between 20 to 45% [24].

In our study 15.5% of the total infertilty cases had endometrial polyp. Hysteroscopicpolypectomy performed with the help of hysteroscopic scissors and bipolar resectoscope. Normal saline was used as a distension media. Other common hysteroscopic findings were submucous fibroids (grade 0 & grade 1), partial uterine septum and transvaginal septum.

Fertility enhancing endoscopic procedures carried out in the same sitting. Other than mild abdominal pain there was no major surgical oranaesthetic complication seen in any of our patients.

Conclusion

In this prospective study of 116 patients of infertility, laparoscopic findings were positive in 82cases while hysteroscopic findings were positivein 46 cases. Secondary infertilty patients were slightly elder to primary infertility group.

Laparoscopic findings were more common than Hysteroscopic findings in primary and secondary group.

On laparoscopy tubal factors were the commonest pelvic pathology seen in both the groups. Uterine polyps were the most common intrauterine abnormality found on hysteroscopy in both the groups.

Fertility enhancing minimal access surgeries including laparoscopy and hysteroscopy are invaluable in complete infertility work up of primary and secondary infertility.

Itdefinitely helps in the understanding of disease pathology and comprehensive management in cases of primary and secondary infertility.

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