

# Diagnostic and Therapeutic Role of Combined Hysteroscopy in Female Infertility

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## Abstract

**Objective:** We designed this study to evaluate the role of combined hysteroscopy in female infertility and the incidence of various pathological conditions in the female reproductive tract leading to infertility.

**Materials & Methods:** We conducted this prospective observational study in BLDE(DU) Shri B M Patil Medical College and Research Centre, Vijayapur hospital from the year 2019 to 2021. Complete information regarding baseline endocrinal investigations, ovulation study, postmenstrual HSG, and semen analysis of husbands was collected. Under general anaesthesia Diagnostic Hysteroscopy was performed, for examining the Uterine cavity pathology, 0.9% normal saline was used to dilate the uterine cavity. Meanwhile, laparoscopy was performed and chromo perturbation done to assess the tubal patency. Both Hysteroscopic and Laparoscopic findings and procedures performed were noted.

**Results:** The major reason in the overall study group was ovarian factors (12 cases 24% ratio) while no pathology was found in 16 (33%) cases. The tubal blockage was reported in 9 (18.5%) while uterine factors affected 8 (16.5%) cases (Table 2). In the primary infertility group 18 (53.8%) cases show normal laparoscopy results, 11(29.4%) had PCOS, and 1 (3.8%) had peritubular adhesions. Comparatively, the secondary infertility group revealed normal laparoscopy results in 4 (31.8%) cases, 2 (4.5%) PCOS cases, 5 (40.9%) tubal blockage, and 3(13.6%) cases of PID. Hysteroscopic findings revealed 12 (7.6%) cases of fibroids, 4 (2.5%) cases of polyps, and 2 (1.2%) cases of cervical stenosis whereas 4 (9%) cases of synechiae, 2 cases of fibroids, 2 cases of polyps and 2 cases of the foreign body observed in secondary infertility group.

**Conclusion:** In the end, we observed positive outcomes of hysteroscopy in diagnosing structural abnormalities in infertile patients.

**Keywords:** Diagnostic, Management, Infertility, hysteroscopy

## INTRODUCTION:

Infertility is a major medical issue affecting 10-15% of couples approximately.<sup>1</sup> World health organization defines this as the condition in which a couple is unable to achieve a clinical pregnancy after one year of regular unprotected sexual intercourse.<sup>2</sup> In developing countries, infertility is the most important reproductive health problem associated with many social stigmas responsible for societal repercussions and personal suffering. More than 70 million couple has infertility issues worldwide however Asian region with a high number of the population reported 3.9% to 16.8% cases of infertility.<sup>3</sup> The fertility potential of both partners is important for conception however, female factors contribute 40 to 45% in the etiology of infertility.<sup>4</sup> Tubal factors, endometriosis, and uterine and cervical factors are the major reasons for infertility worldwide. Almost 40–50 % of infertile couples had subperitoneal disease 30-40% of cases had ovulatory disorders whereas 15-20% of cases of infertility involved uterine factors.<sup>1</sup>

Medical science focused on evolving and introducing procedures to minimize the burden of infertility.<sup>5</sup> With this aim, hysteroscopy has been introduced in clinical settings to diagnose and treat infertility cases. Hysteroscopy (is considered the gold standard method to diagnose tubal, ovarian, peritoneal, and uterine factors.<sup>6</sup> It is considered a minimally invasive technique providing a panoramic and highly magnified view of the uterine and peritoneal cavity. This method is helpful to detect 35 to 68% of cases of peritubular adhesions, tubal pathology, peritubal adhesions,

and endometriosis.<sup>7</sup>Therefore, we designed this study to evaluate the diagnostic and therapeutic role of combined hysterolaparoscopy for infertility

## MATERIAL AND METHODS:

This study was conducted in infertility clinic, department of obstetrics and gynecology, BLDE (DU) Shri. B.M. Patil medical college, Vijayapur, done from April 2019 to May 2021. Patients between 20 and 45 years of age with either primary or secondary infertility of more than 1 year duration were included in this study. Primary infertility patients are those who had never conceived before, while secondary infertile patients are the ones with at least one prior conception, irrespective of the outcome. Hormonal abnormalities known to cause anovulation like thyroid dysfunction, hyperprolactinemia, and polycystic ovarian syndrome were excluded. Couples with abnormal semen analysis were also not included in this study. [2] DHL with chromopertubation test was performed in early follicular phase in all the patients.

### Sample size calculation

With 95% confidence level and margin of error of  $\pm 5\%$ , a sample size of 196 subjects will allow the study to evaluate the role of combined hysterolaparoscopy in female infertility and the incidence of various pathological conditions in the female reproductive tract leading to infertility.

Total sample is  $\approx 200$ .

By using the formula:

$$n = \frac{z^2 p(1-p)}{d^2}$$

where

Z= z statistic at 5% level of significance

d is margin of error

p is anticipated incidence rate (15%)

For this study, we recruited only 50 patients, as admissions were less due to covid during this period. For this study, primary infertility was defined as those patients who never conceived before while patients who already had at least one prior conception were defined under the category of secondary infertility irrespective of the outcome. We only include patients of primary and secondary infertility for more than one year with no contraindication for hysterolaparoscopy.

Meanwhile, we excluded all the cases of hormonal abnormalities which are known to cause anovulation like thyroid dysfunction and hyperprolactinemia. Cases of morbid obesity, acute pelvic infections, and peritonitis, severe anemia were also excluded. Any medical orders which are contraindications for creating pneumoperitoneum were also not entertained. We calculated the sample size with an estimation of  $\pm 5\%$  margin of error at a 95% confidence interval. We set a 15% anticipated prevalence rate and systematic random sampling was used for data collection. A complete medical history of each patient was obtained and thorough gynecological examinations were held a day before surgery. Complete information regarding baseline endocrinal investigations, ovulation study, postmenstrual HSG, and semen analysis of husbands was collected. Cases with abnormal semen analysis were excluded at that time. We asked our patients to complete fasting after 10 p.m a day before surgery and the procedure was carried out between the 6th to 12th day of the menstrual cycle. Written consent was taken from patients before initiating any procedure to ensure the safety of the procedure and the confidentiality of their data. In the cervical canal, we introduced a hysteroscope under general anesthesia. For examining the pathology, 0.9% normal saline was used to dilate the uterine cavity. Meanwhile, laparoscopy was performed by chromo perturbation to assess the tubal patency. Once the procedure was done patients were shifted to the ward and were discharged next.<sup>8</sup>

**Statistical Analysis:** Excel sheets were formed for data collection. All the data were presented in frequency distribution using numbers and percentages.

## RESULTS:

During the time frame, 315 infertility cases were reported. In this study total of 50 infertility cases were recruited who fulfilled the inclusion criteria. Of them, 38 were of primary infertility with a mean age of  $(26 \pm 3.5)$  while 12 were enlisted in the secondary infertility group with a mean age of  $(31 \pm 4.8)$  years. Age is an important factor in fertility and both groups show significant differences in terms of age ( $p$ -value  $< 0.05$ ). The majority of the cases in both groups had infertility duration of 2-5 years (20/38 and 7/12). Furthermore, 3 (24.3%) cases of the primary group had an infertility duration of 1-2 years. In the primary infertility group, 38 (79.4%) cases were asymptomatic, 9(24.3%) had unhealthy discharge, irregular menstrual patterns were reported in 19(51.2%) cases, while dysmenorrhea was reported in 13 (34.6%) cases. Meanwhile, the secondary infertility group revealed 8(63.6%) asymptomatic cases, 5 (40.9%) with irregular menstrual patterns, and 4 (36.3%) with unhealthy discharge. Detailed analysis is shown in Table 1. The major reason in the overall study group was ovarian factors (12 cases 24% ratio) while no pathology was found in 16 (33%) cases. The tubal blockage was reported in 9 (18.5%) while uterine factors affected 8 (16.5%) cases (Table 2). In the primary infertility group 18 (53.8%) cases show normal laparoscopy results, 11 (29.4%) had PCOS, and 1 (3.8%) had

peritubular adhesions. Comparatively, the secondary infertility group revealed normal laparoscopy results in 4 (31.8%) cases, 2 (4.5%) PCOS cases, 5(40.9%) tubal blockage, and 2 (13.6%) cases of PID. Hysteroscopic findings revealed 12 (7.6%) cases of fibroids, 4 (2.5%) cases of polyps, and 2 (1.2%) cases of cervical stenosis whereas 4 (9%) cases of synechia, 2 cases of fibroids, 2 cases of polyps and 2 cases of the foreign body observed in secondary infertility group (Table 3). Various surgical interventions at the time of hysterolaparoscopy are shown in Table 4

**Table 1: Demographic and Clinical characteristics of patients**

	Primary infertility (N= 38) %	Secondary infertility (N= 12) %
Age in years		
> 36	4 (10.2%)	3 (22.7%)
31-36	8 (21.1%)	5 (40.9%)
26-30	15 (39.1%)	3 (22.7%)
21-25	11 (28.2%)	2 (13.6%)
Infertility Duration		
1-2 years	3 (24.3%)	2 (18.1%)
2-5 years	20 (54.4%)	7 (54.5%)
> 5 years	15 (21.1%)	3 (27.2%)
Complaints		
Unhealthy discharge	9 (24.3%)	4 (36.3%)
Asymptomatic	38 (79.4%)	8 (63.6%)
Chronic pelvis pain	4 (10.2%)	4 (29.5%)
Irregular menses	19 (51.2%)	5 (40.9%)
Excessive hair growth	7 (17.3%)	3 (20.4%)
Dysmenorrhea	13 (34.6%)	4 (31.8%)

**Table 2: Reasons of infertility**

Reasons	N=50 (%)
No pathology	16 (33%)
Ovarian	12 (24%)
Peritoneal	5 (9%)
Tubal	9 (18.5%)
Uterine	8 (16.5%)

**Table 3: Laparoscopic and Hysteroscopic findings**

	Primary infertility (N= 38) %	Secondary infertility (N= 44,12) %
Laparoscopic findings		
Normal	18 (53.8%)	4 (33.3%)
Peritubal adhesions	1 (1.6 %)	0
PCOS	11 (29.4%)	2 (16.6%)
Endometriosis	4 (6.4 %)	0
Tubal blockage	2(3.2 %)	2 (16.6%)
Pelvic inflammatory disease	1 (1.6%)	2 (16.6%)
Hydrosalpinx	1 (1.6%)	1 (8.3%)
Tubo ovarian mass	1(1.6 %)	1 (8.3%)
Hysteroscopic findings		
Synechia	0	4 (9%)
Fibroid	3 (7.6%)	2 (4.5%)
Cervical stenosis	1(1.2%)	0
Septum	2 (2.5%)	0
Foreign body	0	2 (4.5%)
Polyp	2 (2.5%)	2 (4.5%)
Sub septate uterus	2 (2.5%)	0

**Table 4: Surgical intervention at the time of hysterolaparoscopy<sup>8</sup>**

	Primary infertility	Secondary infertility	Total
Ovarian drilling	20 (60%)	1 (25%)	21 (63.3%)
Conversion to laparotomy	3 (10.3%)	1 (25%)	4 (12.1%)
Hysteroscopic cannulation	3 (10.3%)	2 (50%)	5 (15.1%)
Adhenolysis	1 (3.4%)	0	1 (3.03%)
Septal resection	2 (6.8%)	0	2 (6.06%)

## DISCUSSION:

This study was conducted to evaluate the diagnostic and therapeutic role of combined hysteroscopy in female infertility. In the past, it is widely accepted that infertility is a common medical problem, therefore, hysteroscopy was established to diagnose primary and secondary infertility. A high risk of tubal, ovarian, peritoneal, and subtle endometrial pathologies has been observed in women having a normal hormonal profile, normal ovulation, and normal pelvic ultrasound findings. Hysteroscopy helps to understand the subtle changes and abnormalities. In our study, we observed 78% of cases of primary infertility while 21.8% had secondary infertility. These results are comparable with one of the Pakistani studies in which they reported 62% cases of primary infertility in the Rawalpindi region.<sup>9</sup> Menstrual irregularities were the major cause of infertility in our research. More than half of the primary infertility group reported menstrual irregularities while 40% of cases were reported in the secondary infertility group. PCOS was the major contributor to menstrual disturbance arising from anovulation or oligo-ovulation and ranges from amenorrhea to oligomenorrhea in PCOS. A previous study by Barbosa G et al<sup>10</sup> revealed an 80% ratio of oligomenorrhea and 40% amenorrhea in PCOS cases. Our study also observed abnormal DHL findings in 91% of cases of secondary infertility while 62% of cases of primary infertility also had abnormal DHL findings. Our findings of the primary infertility group were parallel to the previous studies. Ramesh's<sup>11</sup> study observed a comparatively high ratio (75.5%) of abnormal DHL in the primary infertility group while their secondary group had less abnormal DHL ratio than the current study (76.6% vs 91%). Meanwhile, Jasmina et al<sup>12</sup> observed 54.5% and 59.5% abnormal DHL findings in primary and secondary infertility groups respectively. and Zhang's<sup>13</sup> study observed 64.3% abnormal DHL findings in primary infertility cases while the ratio of secondary infertility cases was much lower than ours (49.2% vs 91%). We observed ovarian factor infertility in 48 (24%) patients due to high consumption of fast food, lifestyle changes, and will work or exercises in daily routine. Our results are collateral with the study of Sumanpul<sup>14</sup> study in which they observed PCOS in 22% study population. However, our results contradict the Zhang<sup>13</sup> study in which they observed only a 5.3% contribution of PCOS in infertility.

In addition, the tubal factor was the second most frequent reason for infertility in our study. We observed 37 (18.2%) cases affected by chlamydial infection and tuberculosis in the past which blocked the fallopian tubes and caused peritubular adhesions. Our results were way lesser than the study of Amrita et al<sup>15</sup> in which they observed 35.5% cases of tubal blockage. In the current study uterine factors were also responsible for infertility in 33 (16.3%) cases. Out of these 37 cases, 6.7% had uterine fibroids interfering the sperm transport. Zhang's<sup>13</sup> study observed 15.5% cases of myoma twice our results. We also observed uterine anomalies such as the septum, subseptate uterus, and cervical stenosis. These anomalies especially uncorrected septum cause fetal death in the first trimester in 65% of cases. The secondary infertility group had a history of dilatation and curettage resulting in synechiae formation in 9% of cases. These results show uniformity with the Ibinayeet al<sup>16</sup> study in which they observed 11% cases of synechiae formation in the secondary infertility group. We also found 2.4% cases of endometriosis out of 8.6% cases suffering from peritoneal factors of infertility. Our findings suggested that the fertility rate can be enhanced by performing hysteroscopy combined with ovarian drilling, hysteroscopic cannulation, septal resection, and adhesiolysis. We performed these methods in 31.7% of infertile cases.

## Conclusion:

Diagnostic Hysteroscopy has been found to be an safe and effective Procedure useful for infertility patients, and we can do the corrective procedures in the same operative settings. Definitive cause can be known and patient and relatives can be counseled for success of Treatment.. The procedure will help the patients so that they can avail higher treatments like IVF at the earliest. And this will also avoid unnecessary treatment were success is low. So Diagnostic Hysteroscopy to be considered as investigation on daycare basis for evaluating patients with infertility.

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