



## Role of Diagnostic Hysterolaparoscopy in Female Infertility: A Retrospective Study

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### Abstract

**Introduction:** Diagnostic Laparoscopy is a minimally invasive technique that gives pelvic organs and provides information on the status of the fallopian tubes, ovaries and uterus. It is considered as gold standard for the diagnosis of various diseases e.g; pelvic inflammatory disease, endometriosis, cysts, pelvic congestion, fibroids and tuberculosis. Similarly, visualizing the uterine cavity and identifying the possible pathology has made hysteroscopy an essential part of infertility evaluation. Infertility accounts for 10-15 % of reproductive age couples. This study was undertaken with an aim to understand the role of diagnostic hysterolaparoscopy in cases of unexplained infertility.

**Materials and Methods:** This was a retrospective study of women with primary or secondary infertility presenting to our department. Patients between 20 and 45 years of age with infertility were included in this study on the basis of a predefined inclusion and exclusion criteria. Hormonal analysis (FSH, LH, Prolactin, and TSH) was done in indicated patients. Hysterolaparoscopy was done and corrective surgery was done if needed. Data was analyzed using SSPE 21.0 software. P value less than 0.05 was taken as statistically significant.

**Results:** A total of 24 infertile women were included in this study. 21 (87.5%) women had primary infertility and 3 (12.5%) had secondary infertility. The most common age group was found to be between 20-30 years (58.3%). 12 (50%) patients were married since more than 5 years. Most of the patients with infertility were asymptomatic (58.3%). 41.6% women were having some type of abnormal menstrual disorder. Abnormalities detected through laparoscopy were more in number than the abnormalities detected through hysteroscopy. In majority of the patients (79.1%) hysteroscopy was found to be normal. The most common pathology seen on hysteroscopy was uterine synechia (16.6%). On laparoscopy all patients were found to have some or the other pathology. The most common pathology found to be seen on laparoscopy was pelvic adhesion (33.33%) followed by endometriosis (29.16%) and polycystic ovaries (20.8%).

**Conclusion:** Hysterolaparoscopy is an effective, safe and minimally invasive procedure in the comprehensive evaluation of female infertility, as it could diagnose the pathologies such as endometriosis and periadnexal adhesions which otherwise could have been missed by other diagnostic modalities.

**Keywords:** Infertility, hysterolaparoscopy, Pelvic adhesions, endometriosis.

## Introduction

The prevalence of infertility is reported to be between 10-15% in couples of reproductive age group<sup>1</sup>. Either male (varicocele, oligospermia and azoospermia) or female factors (infections of fallopian tubes, congenital uterine anomalies or polycystic ovarian syndrome) may be responsible for infertility. In some cases male as well as female factors may be present simultaneously whereas in a small number of patients the cause of infertility remains unexplained<sup>2</sup>. The cases of infertility are further subdivided into primary and secondary infertility on the basis of whether the woman has never conceived in past (primary infertility) or there is history of past pregnancy (secondary infertility). Couples with primary infertility are more likely to seek medical help as compared to couples with secondary infertility. With advances in assisted reproductive techniques (ARTs) and increased acceptance of invitro fertilization in the society there is an exponential increase in women opting for ARTs<sup>3</sup>.

The assessment of couples with infertility usually starts with investigations which may point towards common conditions causing infertility such as polycystic ovarian syndrome, tubal blockage and uterine abnormalities in females and varicocele, azoospermia or oligospermia in males<sup>4</sup>. In this regard commonly advised investigations include ultrasonography (uterine anomalies, polycystic ovaries and abnormalities of fallopian tubes in females and assessment of seminal vesicles and testis), color doppler (varicocele) hysterosalpingography (assessment of uterus and fallopian tubes) and MR imaging (congenital uterine anomalies and diseases affecting fallopian tubes)<sup>5</sup>. All these investigations are relatively non-invasive, quick to perform and have a high degree of reliability in expert hands except in case of hysterosalpingography which is associated with exposure to radiation as well as side effects associated with contrast<sup>6</sup>. One of the major disadvantage of investigation such as ultrasound, color doppler and MR imaging is that they don't have any therapeutic value<sup>7</sup>. Moreover

one of the crucial advantage hysterosalpingography have over hysterosalpingography is that it can diagnose presence of endometriosis and periadnexal adhesions even in patients in whom hysterosalpingography turned out to be normal<sup>8</sup>. Hysterosalpingography can further diagnose presence of pelvic inflammatory disease which is a common cause of infertility in developing countries<sup>9</sup>.

Hysterosalpingography has got a unique advantage in the sense that it gives ability to visualize and manipulate the uterus, ovaries and fallopian tubes and if required the therapeutic interventions can be done during the laparoscopy<sup>10</sup>. It further enables visualization of uterine and tubal morphology and in some cases unsuspected pathologies may be diagnosed during hysterosalpingography<sup>11</sup>. In many cases interventions in same sitting is possible making it diagnostic as well as therapeutic procedure of crucial importance in management of infertility. Being minimally invasive hysterosalpingography is associated with reduced cost, quick recovery and increased acceptability in patients as compared to open surgeries<sup>12</sup>. Moreover being minimally invasive it is associated with better homeostasis and comparatively better Visual analogue scores (for pain assessment)<sup>13</sup>.

We conducted this retrospective study of patients with primary as well as secondary infertility with an aim to understand the role of diagnostic hysterosalpingography in cases of unexplained infertility.

## Materials and Methods

This was a retrospective study conducted in the department of obstetrics and gynecology of a tertiary care medical college situated in an urban area. 28 women with either primary or secondary infertility who had undergone hysterosalpingography were included in this study on the basis of a predefined inclusion and exclusion criteria. The demographic details such as age, time since marriage, menstrual history, reports of earlier investigations if available, primary or secondary

infertility, reports of hormonal assessment and male factors were noted down in a proforma. The couples in whom male factor was found to be responsible for infertility were excluded from the study. Reports of ultrasound and doppler examination as well as any other imaging technique were also noted down. If the patient has previously undergone hysterosalpingography then its findings were noted to confirm or rule out presence of abnormalities of uterine cavity and fallopian tubes. In all patients hysterolaparoscopy was done in follicular phase of the menstrual cycle under general anesthesia and with methylene blue dye. Intraoperative findings, any therapeutic measure undertaken and perioperative and postoperative complications were noted. The data was analyzed with a special emphasis on finding out the etiological factor (such as uterine synechia, pelvic adhesions, polycystic ovaries or endometriosis) responsible for infertility. The statistical analysis was done using SSPE 16.0 software and for all statistical purposes p value less than 0.05 was taken as statistically significant.

**Inclusion Criteria**

1. Women having primary or secondary infertility.
2. Age group of 20-45 years.
3. Normal Seminal Analysis in male partner.
4. women failed to conceive with minimum three cycles of ovulation induction

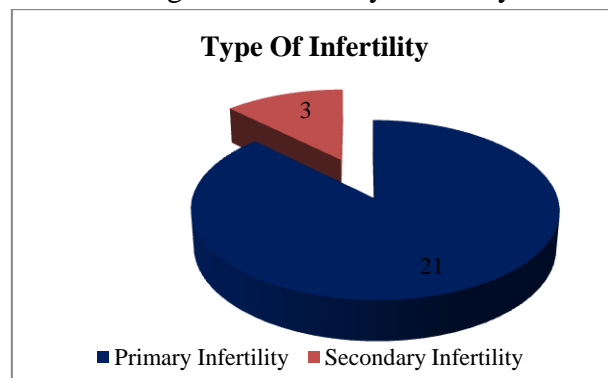
**Excluding Criteria**

1. Male factors responsible for infertility.
2. Hormonal abnormalities are known to cause anovulation such as thyroid dysfunction, hyperprolactinemia,
3. Age less than 20 or more than 45 years.
4. Patients whose complete medical record was not available.
5. Active pelvic infection,
6. Patients having contraindications to general anesthesia.

**Results**

This was a retrospective study in which 24 patients with either primary or secondary

infertility and who has undergone hysterolaparoscopy were included. Out of 21 (87.5%) belonged to primary infertility whereas 3 (12.5%) patients belonged to secondary infertility.



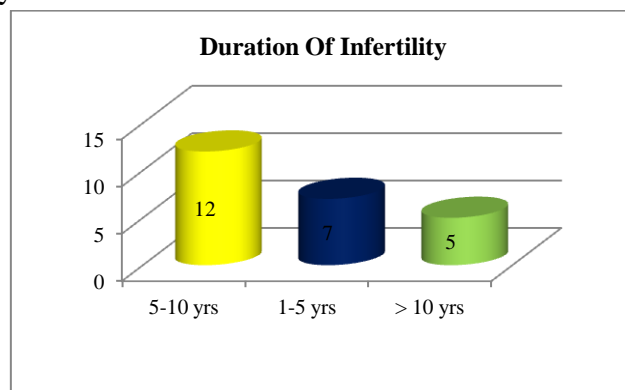
**Figure 1:** Primary Versus Secondary Infertility in the studied cases.

The analysis of age groups of the studied cases showed that majority of the patients belonged to age group of 20- 30 years (58.3%) followed by 36-40 years (20.83%) and 31-35 years (16.66%). Only 1 patient (4.16%) belonged to age group more than 40 years.

**Table 1:** Age group of the studied cases

Age Group	Number of Cases	Percentage
20-25 years	6	25.00%
26-30 years	8	33.33%
31-35 years	4	16.67%
36-40 years	5	20.83%
> 40 years	1	4.17%
<b>Total</b>	<b>24</b>	<b>100 %</b>

The analysis of the duration of the infertility in the studied cases showed that 12 patients (50%) had history of infertility between 5-10 years whereas 7 patients (29.16%) had infertility of 1-5 years. 5 patients (20.84%) had infertility of more than 10 years.



**Figure 2:** Duration of Infertility in the studied cases.

The analysis of symptomatology of the patients showed that 14 (58.3%) were completely asymptomatic and had no history of any complaints whereas 10 (41.6%) patients had history of various menstrual irregularities including oligomenorrhoea (25.00%) and hypomenorrhoea (16.67%).

**Table 2:** Menstrual Irregularities in studied cases

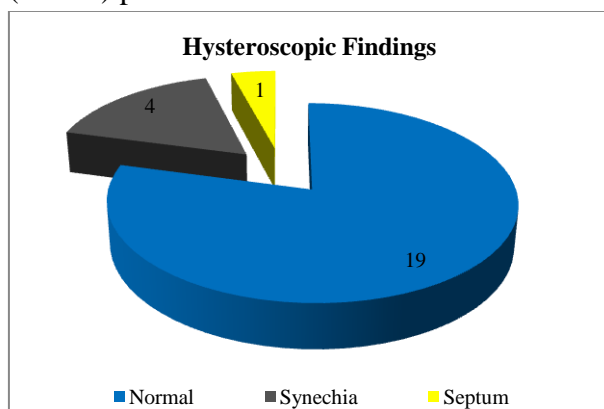
Menstrual Abnormalities	Number of Cases	Percentage
Oligomenorrhoea	6	25.00%
hypomenorrhoea	4	33.33%
Normal Menstrual Cycles	14	16.67%
<b>Total</b>	<b>24</b>	<b>100 %</b>

The analysis of findings of chromopertubation showed that in patients with primary infertility bilateral tubal patency could be established in 12 (50%) patients whereas unilateral and bilateral tubal occlusion was found in 6 (25%) and 3 (12.5%) patients respectively. All 3 patients with secondary infertility were found to have bilateral tubal blockage (12.5%).

**Table 3:** Findings of chromopertubation in primary and secondary infertility cases

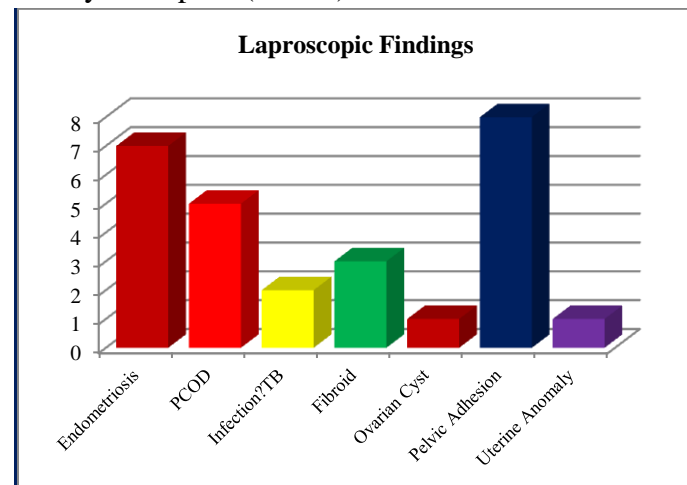
Findings	Primary	Secondary	Total
Unilateral	6	0	6
Bilateral	3	3	6
No blockage	12	0	12
<b>Total</b>	<b>21</b>	<b>3</b>	<b>24</b>
<b>P = 0.217 (Not Significant)</b>			

On hysteroscopy 19 (79.1%) patients were normal whereas most common abnormality noted was presence of uterine synechia which were seen in 4 (16.6%) patients. intrauterine septum was seen in 1 (4.16%) patient.



**Figure 3:** Hysteroscopic Findings in the studied cases.

The analysis of patients on the basis of laparoscopic findings showed that the most common pathology found on laparoscopy was pelvic adhesions (33.33%) followed by endometriosis (29.16%), polycystic ovaries (20.8%) and fibroid (12.5%). In minority of the patients pathologies such as infection (8.3%), ovarian cysts (4.16%), uterine anomalies (4.16%) and hydrosalpinx (4.16%) was noted.



**Figure 4:** Laparoscopic Findings in the Studied cases

**Discussion**

This was a retrospective study of patients who had undergone hysterolaparoscopy for either primary or secondary infertility. In our study majority of the patients (87.5%) were having primary infertility whereas only 3 (12.5%) patients had secondary infertility. Majority of authors studying female infertility have found that patients seeking consultation for infertility predominantly consist of women with primary infertility. Various authors have reported similar predominance of primary infertility in their studies. Benksim et al conducted a cross sectional study to determine the difference between primary and secondary infertility and the associated factors among women referred for infertility<sup>14</sup>. Socio-economic status, demographic details, age, nutritional status and other data associated with both male and female reproductive organs were collected by a questionnaire. The authors found that rates of primary and secondary infertility were 67.37% and 32.63%, respectively. The authors concluded

that age, duration of marriage and socio-economic status are predictive variables that affects the chance of fertility among women with secondary infertility. Similar predominance of cases with primary infertility has also been reported in the studies conducted by Davari TF et al<sup>15</sup> and Masoumi SZ et al<sup>16</sup>.

In our study more than 50% of the patients belonged to age group of 20-30 years and majority of them had infertility since 5- 10 years. Antaratani RC et al conducted a retrospective a study to determine the role of hysterolaparoscopy in the evaluation and management of female infertility. In this study Majority of cases (39.1%) were in the age group of 26–30 years. Hence our study had similar findings as that of study conducted by Antaratani RC et al as far as age of the patients is concerned<sup>17</sup>.

In our study on chromopertubation bilateral tubal patency could be established in 12 (50%) patients whereas unilateral and bilateral tubal occlusion was found in 6 (25%) and 3 (12.5%) patients respectively. All 3 patients with secondary infertility were found to have bilateral tubal blockage (12.5%). We couldn't find any statistically significant difference in the incidence of tubal blockage in primary as well as secondary infertility ( $P>0.05$ ). Similarly Begum J et al in their study of women who had undergone hysterolaparoscopy for infertility reported that tubal block was seen in 36 (40.9%) primary and 18 (38.2%) secondary infertility cases. Similar to our study Begum J et al also haven't found any statistically significant difference in incidence of tubal blocks in patients with primary and secondary infertility<sup>18</sup>.

Daddenavar et al conducted a prospective study to analyse various etiological factors responsible for infertility in females using hysterolaparoscopy. In their study of 50 cases of infertility the authors found that Chromopertubation test was bilaterally positive i.e. both the tubes were found to be patent in 36 cases of which 27 cases (77.14%) were of primary infertility and 9 cases (60%) were of secondary infertility. Chromopertubation test

could not be commented upon in 2 cases (4%) due to presence of extensive adhesions<sup>19</sup>.

In our study the most common pathology found on laparoscopy was pelvic adhesions (33.33%) followed by endometriosis (29.16%), polycystic ovaries (20.8%) and fibroid (12.5%). In minority of the patients pathologies such as infection (8.3%), ovarian cysts (4.16%), uterine anomalies (4.16%) and hydrosalpinx (4.16%) was noted. The etiology of infertility reported by the authors such as Mehta AV et al was similar to our study who reported the common causes of infertility to be endometriosis (12%), adhesions (8%) and tubal (7%) or ovarian pathologies (7%)<sup>20</sup>.

### Conclusion

Hysterolaparoscopy is an effective, safe and minimally invasive procedure in the comprehensive evaluation of female infertility, as it could diagnose the pathologies such as endometriosis and periadnexal adhesions which otherwise could have been missed by other diagnostic modalities. On hysteroscopy, adhesiolysis for uterine synechiae and proximal tubal cannulation for tubal block patients can be done in the same setting.

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