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## A Clinical Study Of Diagnostic Hysterolaparoscopy As A Tool In Evaluation Of Female Infertility.

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### ABSTRACT

To study the evaluation of various causes of infertility in female with primary and secondary infertility, by diagnostic hysterolaparoscopy. All the women aged between 20 to 40 years with primary and secondary infertility were included for the study. Uterine factors, tubal factors, ovarian factors and peritoneal factors were analyzed. In our study, out of 100 cases 73% presented with primary infertility and 27% secondary infertility. Most common age group in primary infertility (43%) was 26-30 years, in secondary infertility (48.1%) was 31-35 years. Majority of primary infertility (67.1%) presents with 1-5years, secondary infertility (55.6%) with 6-10 years duration of infertility. 75% of total cases presented with regular menstrual cycle, 25% with irregular cycle. 72% of total cases presented with normal BMI, 28% cases with obesity. Most common factor diagnosed during laparoscopy in primary infertility group is tubal factors in 28.7%, followed by ovarian factors 26.0%, uterine factors 10.9% and peritoneal factors 5.4% of cases. Most common factor in secondary infertility group is tubal factors in 55.5%, followed by ovarian factors 37%, peritoneal factors 11% and uterine factors in 9% of cases. During diagnostic hysteroscopy, submucous fibroid present in 5%, submucous polyp in 4%, subseptate uterus in 2%, septate uterus in 1%, bicornuate uterus in 1% and intrauterine adhesion in 1% of total cases. The diagnostic hysterolaparoscopy is an gold standard and safe tool in evaluation of female infertility. It helps in the diagnosis of specific causes of infertility, which is not diagnosed by other investigations.

**Keywords:** Hysterolaparoscopy, infertility, tubal blockade.

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## INTRODUCTION

Reproduction is an basic expectation of human life. The desire of reproduction is an important motivating human force. Fertility stands for reproductivity, continuity and growth. Infertility is an major health problem, which is present as long as the history of mankind [1]. According to WHO, 60-80 million couples are infertile worldwide and 10 to 15% of couple in the reproductive age are infertile [2]. There is dramatic increase in the number of couples attending medical advice, for infertility. The incidence of infertility varies between 5-15% in any community. This problem may be due to the delayed child bearing to achieve educational, Professional goals and Socio-economic status [3]. The awareness of infertility is increased nowadays and multicentric approach to the treatment have been introduced, but the management of infertility is always challenging [4]. Normal fertility depends on various male and female factors. Tubal and peritoneal factors are responsible for 20-40% of causes of female infertility [5].

These include tubal block, Pelvic inflammatory disease, pelvic adhesions, endometriosis and acquired uterine abnormality like uterine synechiae. So the assessment of tubal patency, peritoneal factors and uterine cavity are important in investigation of infertility. Laparoscopy is the gold standard diagnostic tool in evaluation of tubal and peritoneal factors. It allows direct visualization of all pelvic organs. Hysteroscopy is used for visualization of uterine cavity [6]. Laparoscopy is also called as “Keyhole Surgery” or “Minimal invasive Surgery”. It is the single procedure, which gives maximum information in evaluation of the female infertility. Abnormal findings of HSG is validated by direct visualization during Laparoscopy [7]. Laparoscopy has an advantage of careful assessment of the architecture of fallopian tubes and fimbria. Abnormality detected in laparoscopy like tubal obstruction, endometriosis and pelvic adhesions are treated at the same time during diagnosis. So, diagnostic laparoscopy is an important part of assessment of couples with infertility. Laparoscopic chromopertubation is the gold standard method for tubal patency, is done in the same sitting. It is done by instillation of dye into the cervix and direct visualization of spillage from both fallopian tube through abdominal Ostia in case of patent tube. There is no spillage in patient with blocked tubes [8]. Hysteroscopy is the direct visualization of the uterine cavity with an endoscope. For complete infertility workup, evaluation of the uterine cavity is essential. 10 to 15% of couples seeking treatment, have uterine abnormality, congenital or acquired. Hysteroscopy is the gold standard for evaluation of the endometrial cavity. It is a minimal invasive procedure, for diagnosis and treatment of intrauterine and endocervical pathology [9,10].

## METHODS

The present study was done in the Department of obstetrics and gynecology, at Department Of Obstetrics And Gynecology, Dhanalakshmi Srinivasan Medical College Siruvachur, Perambalur District, Tamil Nadu, India in the month of January 2022. 100 cases were studied for the purpose of the study.

### Inclusion Criteria

- All the women aged between 20 to 40 years, attending outpatient department with primary and secondary infertility.
- To evaluate the cause in women with primary & secondary infertility with normal semen analysis of husband.

### Exclusion Criteria

- Severe cardiac or respiratory disease
- Generalised peritonitis
- Diaphragmatic hernia
- Umbilical hernia
- Morbid obesity, age >40 years.

After taking thorough history, clinical examination, initial assessment and all necessary investigations, patients were advised to report postmenstrually in the proliferative phase for diagnostic hysteroscopy. The first part of the procedure is hysteroscopy. After positioning the patient in lithotomy position and drapping, with the help of Sims speculum cervix was visualised. Anterior lip of cervix was held with volsellum. The hysteroscope was assembled and checked for clarity of image. Then the hysteroscope was introduced through cervix. As soon as, the hysteroscope was engaged into the

external os of the cervix, the distension media flow was started. A 4mm hysteroscope with 30-degree view was usually used. For uterine distension, normal saline with 100mm Hg constant intrauterine pressure was maintained by using electronic pump (hysteromat) Systematic examination of the intrauterine cavity was done during hysteroscopy. The cervical canal was visualized first. A narrow constrictive opening at the end of cervical canal was the internal os. The hysteroscope was manipulated under vision into the uterine cavity. It was introduced further upwards to visualize all four walls of the uterine cavity. Panoramic view of the two ostia visualized, then the anterior, posterior and lateral wall were visualized. Any abnormal findings were documented. The second part of the procedure was laparoscopy.

**RESULTS**

Table 1: Distribution of cases according to type of infertility

Type of Infertility	Number of Patients	Percentage	P Value
Primary	73	73%	<0.001**
Secondary	27	27%	
Total	100	100%	

Note: \*\* Denotes significant

From the table, it has been seen that majority of patient in primary infertility belongs to the age of 26 to 30 years (43%) and in secondary infertility belongs to the age of 31 to 35 years (48.1%). Totally 24% cases presented in the age group of 21 to 25 years, 40% cases from 26 to 30 years, 29% cases from 31 to 35 years, 7% cases from 36 to 40 years. In the present study, 73 cases (73%) were Primary infertility and 27 cases (27%) belongs to secondary infertility.

Table 2: Duration of Infertility

Duration in years	Primary infertility		Secondary Infertility		Total		P Value
	Number of Patients	%	Number of Patients	%	Number of Patients	%	
1-5	49	67.1%	9	33.3%	58	58%	< 0.001**
6-10	16	21.9%	15	55.6%	31	31%	
11-15	7	9.6%	2	7.4%	9	9%	
16-20	1	1.4%	1	3.7%	2	2%	
Total	73	100%	27	100%	100	100%	

In the study, majority of the patients in primary infertility presented with the duration of 1-5 years (67.1%) and in secondary infertility (55.6%) cases belongs to 6-10 years. In the primary infertility group, 8% presents with the duration of 1-2 years, 14% cases 2-3 years, 27% cases 3-5 years duration. In secondary infertility group, 1% presented with 2-3 years, 8% with 3-5 years duration. Totally 58% cases with 1-5 years, 31% cases 6-10 years, 9% cases 11-15 years and 2% cases belong to 16-20 years of infertility.

Table 3: Menstrual History

Menstrual History	Primary infertility		Secondary Infertility		Total	
	Number of Patients	%	Number of Patients	%	Number of Patients	%
Regular	54	73.9%	21	77.7%	75	75%
Oligomenorrhea	9	12.3%	3	11.1%	12	12%
Menorrhagia	8	10.9%	1	3.7%	9	9%
Polymenorrhea	2	2.7%	2	7.4%	4	4%
Total	73	100%	27	100%	100	100%

In the study, majority of the patients (75%) in both the groups found to have regular menstrual history, 12% with oligomenorrhea, 9% menorrhagia, and 4% of them have polymenorrhea.

**Table 4: Obstetric history in secondary infertility**

Obstetric History	Number of Patients	%
Vaginal delivery	9	33.3%
Caeserean delivery	7	25.9%
Previous one miscarriage	5	18.5%
Previous two miscarriages	6	22.3%
Total	27	100%

In our study, 33,3% cases of secondary infertility presented with vaginal delivery, 25,9% Caesarean delivery, 22,3% of them have previous two miscarriages and 18,5% have previous one miscarriage.

**Table 5: Body Mass Index (BMI)**

BMI	Primary infertility		SecondaryInfertility		Total		P value
	Numberof Patients	%	Numberof Patients	%	Numberof Patients	%	
Normal	52	71.2%	20	74.1%	72	72%	< 0.001**
Obesity	21	28.8%	7	25.9%	28	28%	
Total	73	100%	27	100%	100	100%	

In the study, 71,2% of primary infertility group found to have normal BMI, 28,8% have obesity. 74,1% of secondary infertility group with normal BMI, 25,9% obesity.

**Table 6: USG findings**

USG Finding	Primary infertility		SecondaryInfertility		Total	
	Numberof Patients	%	Numberof Patients	%	Numberof Patients	%
Normal	46	63.0%	13	48.0%	59	59%
PCOS	14	19.1%	4	14.8%	18	18%
Ovariancyst	5	6.8%	6	22.2%	11	11%
Fibroid	7	9.6%	1	3.7%	8	8%
Adnexalcyst	1	3.7%	3	11.1%	4	14.8
Total	73	100%	27	100%	100	100%

In our study, out of 100 cases, 59 patients found to be normal USG findings, 18% have PCOS, 11% ovarian cyst , 8% of them with fibroid uterus, and 4% adnexal cyst.

**Table 7: Uterine factors in Diagnostic Laparoscopy**

Uterinefactor	Primary infertility		SecondaryInfertility		Total	
	Numberof Patients	%	Numberof Patients	%	Numberof Patients	%
Normal	65	89%	26	96.3%	91	91%
Fibroid	7	9.6%	1	3.7%	8	8%
ArcuateUterus	-	-	-	-	-	-
Bicoruuateuterus	1	1.4%	-	-	1	1%
Total	73	100%	27	100%	100	100%

In our study, uterine factors accounted for 9% of causes of infertility, out of which 8% cases presented with fibroid uterus. Fibroid uterus more commonly found in primary infertility group. One case of primary infertility with bicornuate uterus.

**Table 8: Tubal factor in Diagnostic Laparoscopy**

Tubal factor	Primary infertility		Secondary Infertility		Total		P Value
	Number of Patients	%	Number of Patients	%	Number of Patients	%	
B/L tubal patent	53	72.6%	15	55.6%	68	68	< 0.001**
B/L tubal block	11	15.0%	8	29.6%	19	19	
U/L tubal block	9	12.3%	4	14.8%	13	13	
Hydro salpinx	1	1.4%	3	11.1%	4	4	

In the study, tubal factors accounted for 36% cases of infertility and 28.7% cases belong to primary, 55.5% cases belong to secondary infertility group. Totally 19% cases presented with bilateral tubal block and 13% cases with unilateral tubal block, 4% Hydrosalpinx.

**Table 9: Ovarian factor in Diagnostic Laparoscopy**

Ovarian factor	Primary infertility		Secondary Infertility		Total		P Value
	Number of Patients	%	Number of Patients	%	Number of Patients	%	
Normal	54	73.9%	17	62.9%	71	71%	< 0.001**
PCOS	14	19.1%	4	14.8%	18	18%	
Ovarian cyst	4	5.5%	5	18.5%	9	9%	
Tubo Ovarian mass	1	1.4%	1	3.7%	2	2%	

As shown in table, ovarian factors responsible for 29% cases, of which majority of them have PCOS (18%). In primary infertility 19.1% PCOS, 5.5% ovarian cyst, 1.4% Tuboovarian mass present. In secondary infertility group 14.8% PCOS, 18.5% ovarian cyst, 3.7% Tuboovarian mass present.

**Table 10: Peritoneal Factor In Diagnostic Laparoscopy**

Peritoneal factor	Primary infertility		Secondary Infertility		Total	
	Number of Patients	%	Number of Patients	%	Number of Patients	%
Normal	69	94.5%	20	74.1%	89	89%
Endometriosis	3	4.1%	3	11.1%	6	6%
Pelvic adhesion	1	1.4%	4	14.8%	5	5%
Total	73	100%	27	100%	100	100%

In our study, peritoneal factors responsible for 11% of total cases. In primary infertility 4.1% presented with endometriosis, 1.4% pelvic adhesion present. In secondary infertility 14.8% pelvic adhesion, 11.1% endometriosis.

**Table 11: Various Factors of Infertility In Diagnostic Laparoscopy**

Various factors	Primary infertility		Secondary Infertility		Total	
	Number of Patients	%	Number of Patients	%	Number of Patients	%
Uterine	8	10.9%	1	3.7%	9	9%
Tubal	21	28.7%	15	55.5%	36	36%
Ovarian	19	26.0%	10	37.0%	29	29%
Peritoneal	4	5.4%	7	25.9%	11	11%
Unexplained	21	28.7%	1	3.7%	22	22%

In our study it has been found, that tubal factors responsible for the most common cause (36%) in both primary (28.7%) and secondary (55.5%) in fertility group. Followed by ovarian factors (29%), peritoneal (11%) and uterine factors (9%). In 22 cases, there were no detectable pathology at Laparoscopy. Total number of cases is not shown in the table as many patients have more than one pathology at Laparoscopy.

**Table 12: Causes of Infertility in Diagnostic Hysteroscopy**

Causes	Primary infertility		Secondary Infertility		Total	
	Number of Patients	%	Number of Patients	%	Number of Patients	%
Submucosal fibroid	4	5.4%	1	3.7%	5	5%
Submucosal polyp	3	4.1%	1	3.7%	4	4%
intra uterine adhesion	-	-	1	3.7%	1	1%
Sub septate uterus	2	2.7%	-	-	2	2%
Septate uterus	1	1.4%	-	-	1	1%
Bicornuate uterus	1	1.4%	-	-	1	

In our study 5% cases found to have submucous fibroid uterus, 4% submucous polyp, 2% subseptate uterus, 1% Septate uterus, 1% intrauterine adhesions and 1% bicornuate uterus present.

### DISCUSSION

Diagnostic hysteroscopy provides a reliable information in evaluation of uterine cavity and detection of intrauterine diseases. Mean prevalence of uterine malformation in general population is 4.3%, in infertility is 3.5% and in recurrent pregnancy loss 13%. The incidence of uterine anomaly is 7.6%. subseptate and septate uterus is the most common uterine malformation in our study, which is undiagnosed by prior USG. Septate uterus is the most common uterine anomaly associated with increased reproductive failure rates [11]. The reproductive performance of uncorrected septum is poor like 80% pregnancy loss, 10% preterm delivery, 10% term delivery. pregnancy outcome improved after surgical correction in to 80% term, 5% preterm delivery, 15% pregnancy loss. complication rate of diagnostic hysteroscopy is low as 0.012%. In view of low complication, less time-consuming hysteroscopy could be done in all infertility patients undergoing diagnostic laparoscopy [12]. Diagnostic laparoscopy is the standard method in diagnosis of tubal, peritoneal pathologies, endometriosis. The mechanism of infertility in fibroid includes cornual fibroid which involves the interstitial segment of fallopian tube and dysfunctional uterine contractility interfering with ovum or sperm transport, embryo implantation, poor regional blood flow to the endometrium. it has been found that uterine pathology in 9% cases [13].

Among this fibroid uterus is 8%. In fibroid uterus distortion of endometrial cavity and impaired gamete transport lead to adverse pregnancy outcome [14]. In the present study we have found tubal factors lead to maximum amount of infertility. Tubal block was present in 32% cases and hydrosalpinx in 4% cases [15]. This may be due to increased incidence of pelvic inflammatory diseases, chronic infections and genital tuberculosis. Tubal damage increases with the number and severity of episodes of PID. In the present study ovarian factors accounts for 29% cases. Among these PCOS is the most common cause in 18% cases followed by ovarian cyst in 9%, TO mass in 2% cases [16].

In PCOS anovulation, failure of corpus luteum development, decreased progesterone and

hyperandrogenism lead to infertility. Endometriosis in 6%, Pelvic adhesion in 5% cases. Pelvic adhesions can be due to infection or previous surgeries. It leads to peritubal and omental adhesions which produces distortion of pelvic anatomy. In the present study submucous fibroid (5%) is the most common pathology detected by hysteroscopy, it causes distortion of the endometrial cavity and implantation failure [17]. Submucous fibroid present in 4%, uterine anomalies 4%, intrauterine adhesion 1% of cases. Uterine anomalies which was undiagnosed by prior USG and other routine investigations also diagnosed during diagnostic hysteroscopy. Uterine anomalies usually causes recurrent pregnancy loss and pregnancy outcome dramatically improved after surgical correction in these patients [18-20].

### CONCLUSION

From our study, it is concluded that the diagnostic hysteroscopy and laparoscopy is an effective and safe tool in evaluation of female infertility. It provides direct and magnified view of all pelvic organs. Diagnostic hysterolaparoscopy is an “definitive daycare procedure” in evaluation of infertility. It helps in the diagnosis of specific causes of infertility, which is not diagnosed by other investigations like hormonal study, USG and HSG. It is an acceptable and feasible procedure, because it has the benefit of shorter hospital stay, less post operative pain and quick return of routine activity. Diagnostic hysterolaparoscopy can be used as an “ONETIME APPROACH” by evaluation and therapeutic procedures can also be done in the same sitting as needed. From our study, we can conclude that combined diagnostic hysterolaparoscopy is the gold standard tool in the evaluation of female infertility.

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