

## ORIGINAL RESEARCH

# A STUDY ON ROLE OF DIAGNOSTIC HYSTERO-LAPAROSCOPY IN EVALUATION OF FEMALE INFERTILITY AT TERTIARY CARE CENTRE

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### ABSTRACT:

**Background:**Living as an involuntarily childless woman is challenging for femininity and female roles in society. Infertility affects about 10-15% of reproductive age couples. WHO estimates that 60-80 million couples worldwide currently suffer from infertility. The causes of female infertility are multifactorial and necessitate comprehensive evaluation. Laparoscopy with chromopertubation is viewed as the “gold standard” test for tubal assessment. Adding Hysteroscopy to the procedure allows for concomitant evaluation of intrauterine cavity. With this preview, my study aims at evaluating the role of diagnostic hystero-laparoscopy as a safe & cost- effective tool for assessment of unexplained female infertility.

**Materials and Methods:** An observational hospital based study on 260 patients was carried out in a tertiary care center Dr. PSIMS &RF, Vijayawada, Andhra Pradesh, India -over a period of 2.5 years from October 2019 to April 2022. Women aged 18-40yr with normal hormone profile without male factor infertility were included.

**Results:** Out of 260 cases, 60.93% patients had primary infertility. PCOS was found to be the most commonly associated with primary infertility. Whereas the most common causes of secondary infertility were found to be PID, endometriosis and endometrial polyps each respectively. Hysterolaparoscopy revealed intrauterine lesions and therapeutic measures like ovarian drilling, lysis of intrauterine adhesions, cystectomy, polypectomy and septal resection were carried out.

**Conclusion:** Hysterolaparoscopy is an effective diagnostic tool for evaluation of correctable tuboperitoneal pathologies like endometriosis, polycystic ovaries, adnexal pathologies and subseptate uterus which are usually missed by other imaging modalities. When done by a trained and experienced investigator and with proper selection of patients, hysterolaparoscopy proves to be a definitive investigative procedure for evaluation of female infertility. It also helps in formulation of a treatment modality.

**Keywords:** Hysterolaparoscopy; Infertility; PCOS; Endometriosis; PID.

**INTRODUCTION:**

Infertility is a worldwide problem, affecting the total wellbeing of the couples involved. The conflux of personal, interpersonal, social and religious expectations may bring a sense of loss, failure and exclusion to those who are infertile. Living as an involuntarily childless woman is challenging for femininity and female roles in society. Thus it is not just a medical problem but also a social one. It has serious demographic, social and health implications.<sup>[1]</sup>

The number of couples seeking medical help for infertility is increasing dramatically 60 to 80 million couples worldwide.<sup>[2-4]</sup> The incidence of female (45.67%) and male (54.33%) infertility appears to be increasing by 5- 15%, but varies among many populations worldwide with an average of 9%.<sup>[5-8]</sup>

The potential causes of infertility can be divided into male factor and female factors. Female factor infertility can be due to multiple causes like decreased ovarian reserve, ovarian factor, tubal factor, uterine factor, pelvic factor and others.

The most common initial diagnostic tests for evaluation of an infertile couple are mid-luteal phase progesterone assay, a test for tubal patency, such as hysterosalpingography (HSG) for females and semen analysis for males. Laparoscopy is reserved for further diagnosis or may be used in combination with endoscopic surgery. Diagnostic exploratory laparoscopy is most accurate minimally invasive and acceptable procedure to detect abdominal and pelvic pathology; it is used for both diagnostic and operative purpose.<sup>[9,10]</sup> It is considered as a gold standard for evaluation of pelvic inflammatory disease, endometriosis, cysts, pelvic congestion, fibroids and tuberculosis.<sup>[11-15]</sup> The present study was carried out to evaluate the role of hysterolaparoscopy as an investigation tool, identify utero-tuboovarian factors, analyse and form a treatment protocol, determine the rate of complications in diagnostic hysterolaparoscopy and to plan for therapeutic intervention in infertility patients.

Our study will give an opportunity to compare the pathological nature of infertility amongst the female population.

**MATERIALS & METHODS:**

The present study was conducted after getting ethical clearance and informed consent on 260 patients visited in the Department of Obstetrics and Gynaecology, Dr. PSIMS &RF, Vijayawada, Andhra Pradesh, India over a period of 2.5 years from October 2019 to April 2022.

**Inclusion criteria**

1. Married women from age group of 18-40 years with primary/secondary infertility willing for infertility evaluation.
2. Patient should have bilateral patent fallopian tubes observed at laparoscopic chromopertubation or HSG or sonosalpingography.
3. Male partners should undergo semen analysis and should have adequate seminal parameters to rule out male factor infertility according to the latest WHO guidelines.

**Exclusion criteria**

1. Patients with regular menstrual cycles
2. Patients with tubal blockage identified by HSG or laparoscopic chromotubation or sonosalpingography.
3. Clinical evidence of hyperprolactinemia
4. Clinical evidence of Diabetes mellitus
5. Clinical evidence of thyroid dysfunction

6. Patients with unexplained infertility
7. Male infertility
8. Sexually transmitted infection
9. Severe anaemia
10. Severe urinary tract infections
11. Cases with suspected pregnancy
12. Patient not willing for surgery

### RESULTS:

The present study was done at the department of Obstetrics and Gynaecology, Dr. PSIMS &RF, Vijayawada, Andhra Pradesh, India.

A total of 260 infertile women, anxious to conceive, who came for infertility evaluation were studied. All the women underwent laparoscopy and hysteroscopy.

In our study, majority 70.38% the patients were aged between 21-30 years followed by 16.15% of 31-40, 9.23% of < 20 yr and 4.23% of >40 age and all were at active reproductive phase of life

**Table 1: showing antimicrobial sensitivity**

Age(years)	Frequency	Percentage%
< 20	24	9.23%
21-30	183	70.38%
31-40	42	16.15%
>40	11	4.23%

In our present study, history of consanguineous marriage was absent in 53.07% of infertile subjects and found in 46.92% of the infertile women indicating its positive correlation with infertility

**Table 2: History of Consanguineous Marriage**

Consanguineous Marriage	Frequency	Percentage %
Present	122	46.92%
Absent	138	53.07%

In our study, we found that about 50.76% of the patients had 5-10 years duration of infertility, followed by 44.23% of the patients who had duration of infertility <5 years and just 3.84% were of > 10 years of infertility duration. The mean duration of infertility in this study was found to be 4.2±2.36years.

**Table 3: Duration of Infertility**

Duration of infertility(years)	Frequency	Percentage %
<5	115	44.23%
5-10	132	50.76%
>10	13	3.84%

In this study, majority 62.30% of the women had irregular cycles while only 37.69% of the women had regular menstrual cycles.

**Table 4: Menstrual Cycles**

Cycles	Frequency	Percentage %
Regular	98	37.69
Irregular	162	62.30

In our study, majority 60% (156) of primary infertility 40% (104) were in secondary infertility patients. Of the total 156 primary infertility mostly 35.38% (92) have shown normal BMI, 13.84% (36) were with overweight and only 10.76% (28) fall in class I obesity. Of the total 104 secondary infertility mostly 25.38% (66) have normal BMI, 7.69% (20) were with overweight and only 6.92% (18) were shown class I obesity. The prevalence of overweight and class I obesity in the present data was 21.53% and 17.69% respectively.

**Table 5: B.M.I**

	Normal (18.5-24.9)	Overweight(25.0-29.9)	Class I obesity(30.0-34.9)	Total
Primary Infertility	92	36	28	156
Percentage %	35.38%	13.84%	10.76%	60%
Secondary Infertility	66	20	18	104
Percentage %	25.38%	7.69%	6.92%	40%
Total no	158	56	46	260
Total %	60.76%	21.53%	17.69%	100%

**Laparoscopic Examination of Ovary**

In this study, laparoscopic examination findings for size, shape and color of the ovary is summarized as following. In primary infertility category, 13.84% (36) women had polycystic ovaries, 14.61% (38) had haemorrhagic cysts, 7.69% (20) had adhesions, 6.15% (16) had para-ovarian cysts (3%) and 4.23% (11) had bulky and only 1.15% (3) were had chocolate cysts. In secondary infertility category, 11.15% (29) hadcyst, 7.30% (19) had endometrial implants of ovary, 6.92% (18) had para-ovarian cyst 4.61% (12) had chocolate cyst 3.46% (9) had haemorrhagic cysts 2.30% (6) bulky and 0.76% (2) had adhesions. In primary infertility 24.23% (63) had normal ovaries where as in secondary infertility 3.84% (10) had normal ovaries.

**Table 6: Laparoscopic Examinaion Findings of Ovaries**

B/L Ovaries	Primary Infertility	Secondary Infertility
Adhesions	20 (7.69%)	2 (0.76%)
Bulky	11 (4.23%)	6(2.30%)
Chocolate Cyst	3 (1.15%)	12(4.61%)
Cyst	36 (13.84%)	29 (11.15%)
Endometrial Implants	0	19 (7.30%)
Haemorrhagic Cyst	38 (14.61%)	9 (3.46%)
Para-ovarian Cyst	16 (6.15%)	18(6.92%)
Normal	63 (24.23%)	10 (3.84%)

In our study, laparoscopic examination of the uterus for size and shape was done. It was found that in primary infertility patients, 33.97% (53) of women had irregular uterus whereas

majority 46.79% (73) had normal uterus. In secondary infertility patients, 5.76% had bulky, 55.76%(58)had irregular uterus whereas 9.61% (10) had congested uterus and 28.84% (30) were had normal uterus size.

**Table 7: Laparoscopic Examination Findings Of Uterus**

Uterus Size	Primary Infertility	Percentage %	Secondary Infertility	Percentage %
Bulky	11	7.05%	6	5.76%
Congested	19	12.17%	10	9.61%
Irregular	53	33.97%	58	55.76%
Normal	73	46.79%	30	28.84%

In present study, in primary infertility patients we found adhesions in 13.46%, (21), 12.17% (19) found right blockage and inflammation in 7.05% (11) of the patients and majority 67.30% of the patients had normal fallopian tubes.

In secondary infertility, 39.42% (41) had right sided tubal blockage followed by 29.80% (31), 11.53% had adhesions and 11.53% of the patients had normal fallopian tubes.

**Table 8: Laparoscopic Examination Findings Offallopiantubes**

Fallopian Tube Appearance	Primary Infertility	%	Secondary Infertility	%
Adhesion	21	13.46	12	11.53
Inflammation	11	7.05	8	7.69
Left Blockage	-		31	29.80
Right Blockage	19	12.17	41	39.42
Normal	105	67.30	12	11.53

In the present study, on laparoscopy, chromopertubation was positive in63.46% (99) of primary infertility patients. 36.53% (57) of primary infertility patients had negative chromopertubation whereas 66.34% (69) of secondary infertility patients had positive chromopertubation test findings and 33.65% (35) were negative chromopertubation test.

**Table 9: Laparoscopic Examination Findings: Chromopertubation Test**

Chromopertubation Test	Primary Infertility	%	Secondary Infertility	%
Present	99	63.46	69	66.34
Absent	57	36.53	35	33.65

In present study, we found in primary infertility patients, 29.23% (76) had endometrialpolyps, 8.46% (22) had submucosal fibroid whereas 7.30% (19), 6.92% (18), 4.61% (12), 3.46% (9) patients had cornual adhesions, septate uterus, unicornuate uterus, cornual adhesions each respectively. In secondary infertility patients, 22.69% had endometrial polyps, 6.15% (16) unicornuate uterus 5.76% patients had cornual adhesions and 5.38% patients had arcuate uterus and 3.07% (8) submucosal fibroids each respectively.

**Table 10: Hysteroscopic Findings**

Hysteroscopic Finding	Primary Infertility (n=74)	%	Secondary Infertility (n=26)	%
Endometrial Polyps	76	29.23%	59	22.69
Submucosal Fibroids	22	8.46	8	3.07
Cornual Adhesions	19	7.30	15	5.76
Unicornuate Uterus	12	4.61	16	6.15
Septate Uterus	18	6.92	2	0.76
Arcuate Uterus	9	3.46	14	5.38

**DISCUSSION:**

Diagnostic hystero-laparoscopy (DHL) plays a vital role in the evaluation of the tubal and peritoneal pathologies in (30- 35%) infertile 16 women. In addition to tubal pathology, laparoscopy enlightens the consultant about any peritoneal disease like endometriosis. The advancement of new perspectives in assisted reproductive technology (ART) through the use of modern infertility evaluation techniques has led clinicians to reassess how infertility should best be treated. Evaluation of uterine cavity in an infertile patient in the era of Intra Uterine Insemination (IUI) and ART techniques is best accomplished by hysteroscopy. The added benefit of this procedure, is “see and treat”: Therapeutic intervention can be done at the same sitting, by the surgeon.<sup>[17-19]</sup>

Study	Sample size	Year	Laparoscopic findings				Hysteroscopic findings	Conclusion
			PCOS	Tubal pathology	Endometriosis	Others		
Nayak PK et al, <sup>[20]</sup>	300	2019	22%	12%	14%	-	Septum (10%) Polyp (5%) Fibroid (3%) Synechiae (1%)	Hystero laparoscopy is an effective diagnostic tool in the evaluation of infertility and has to be included in basic diagnostic workup.
Kabadi et al, <sup>[21]</sup>	94	2016	20.8%	7.7%	5.4%	18.1%	-	Diagnostic hysteroscopy is an effective diagnostic and therapeutic modality for certain significant and correctable abnormalities in pelvis, tubes and uterus which are missed by other imaging modalities.
Geetika Jain et al, <sup>[22]</sup>	203	2014	6.4%	59.6%	8.3%	-	-	laparoscopy is emerging as a valuable technique for complete assessment of female infertility and also helps in treatment according to the cause
Chanu et al, <sup>[23]</sup>	151	2018	20%	4.6%	9.3%	6%	Synechiae (3.3%) Fibroid, polyp and septum (1.99% each)	DHL was helpful in finding some reversible causes of infertility such as adnexal adhesions, tubal blockade, and uterine synechiae, etc.
Mehta et		2016					Septum (10%),	Hysteroscopy may

al, <sup>[24]</sup>	300		26.1%	12%	14%	-	polyp (5%), Fibroid (3%), synechiae (0.1%)	be recommended as the procedure of choice for evaluation of female infertility, which are usually missed by imaging modalities.
Ashok Kumar, <sup>[25]</sup>	50	2017	20%	14%	22%	12%		Diagnostic laparoscopy is the gold standard procedure to assess tubal status. Laparoscopy has a better role than ultrasonography in diagnosing endometriosis and pelvic adhesions.
Nanaware et al, <sup>[26]</sup>	85	2016	-	43.3%	-	40%	Septum and synechiae(5.5% each)	Thus, hysterolaparoscopy may be considered as gold standard and definitive investigative day- care procedure for evaluation of female infertility
Jayakrish nan K Koshy et al, <sup>[27]</sup>	127	2010	25%	12%	6.3%	18.2%	Septum and synechiae (6.6% each)	One in four women had significant pelvic pathology where treatment could possibly improve future fertility. Diagnostic laparoscopy has a role in infertile women with no obvious abnormality before they proceed to more aggressive treatments.
DayanandPuri et al, <sup>[28]</sup>	50	2014	16%	52%	8.7%	21.02%	Septum and synechiae (8.36% each)	laparohysteroscopy for diagnosis and as a therapeutic tool in patients with primary and secondary infertility. We were able to achieve a higher conception rate of 28.2%.
Present study	260		42.2%	19.89%	6.49%	27.64%	Septum (6.6%), Synechiae (4.4%), Fibroid and polyp (2.2% each)	hysterolaparoscopy proves to be a definitive investigative procedure for evaluation of female infertility. It also helps in formulation of a treatment modality

Our study was aimed at evaluating the role of hystero-laparoscopy in the work-up of a total of 260 infertile women, anxious to conceive, presenting at Department of Obstetrics & Gynaecology, at -----

In a study done by Wallace WHB et al. in terms of ovarian reserve, a woman has 12% of her reserve at the age of 30years, and has only 3% at the age of 40years. 81% variation in ovarian reserve is due to age alone, thus age accounts to be the most important factor in female infertility. Female age is the single most important determinant of spontaneous as well as treatment related conception, with a gradual decline in fertility especially after the age of 35years.<sup>[20]</sup>

### CONCLUSION:

PCOS (20.2%) was found to be the most commonly associated with primary infertility in the present study which is similar to the incidence reported by previous studies. Hysterolaparoscopy is diagnostic as well as therapeutic.

In conclusion our findings suggest that hysterolaparoscopy is an effective diagnostic tool for evaluation of correctable tuboperitoneal pathologies like endometriosis, polycystic ovaries, adnexal pathologies and subseptate uterus which are usually missed by other imaging

modalities. It should also be emphasized that it can detect various structural abnormalities in pelvis, tubes and the uterus in the same sitting in patients with normal seminogram and normal ovulation. When done by a trained and experienced investigator and with proper selection of patients, hysterosalpingography proves to be a definitive investigative procedure for evaluation of female infertility. It also helps in formulation of a treatment modality.

In the present study out of 260 cases, 74% patients had primary infertility. PCOS (20.2%) was found to be the most commonly associated with primary infertility. Whereas the most common causes of secondary infertility were found to be PID, endometriosis and endometrial polyps (15.3%) each respectively. Hysterosalpingography revealed intrauterine lesions and therapeutic measures like ovarian drilling, lysis of intrauterine adhesions, cystectomy, polypectomy and septal resection were carried out.

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