

# Role of Diagnostic Hysteroscopy in Evaluation of Primary and Secondary Infertility

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## ABSTRACT

**Introduction:** It is widely accepted that infertility is a life crisis and the number of couples seeking medical help for infertility is increasing dramatically. Aims and Objective is to assess etiological factors in infertility by hysteroscopy. Study design is Cross-sectional study. Place and duration of study is NIMS Infertility and Research centre, Jaipur, over a period of one and half years from January 2014 – June 2015.

**Materials and Method:** 100 infertile women, anxious to conceive, coming for infertility work-up excluding male factor infertility with normal hormonal profile and no contraindication to laparoscopy were subjected to diagnostic laparoscopy and hysteroscopy in NIMS Infertility and Research centre, Jaipur. Observation of pelvic and intrauterine cavity and chromopertubation test was done under general anaesthesia during Hysteroscopy.

**Results:** A total of 100 women underwent hysteroscopy. Age ranged from 21 to 40 years and mean age was 30.03 years. Prevalence of primary infertility was 64% and of secondary infertility was 36%. Abnormalities detected by hysteroscopy alone in 20(25.64%) cases and by laparoscopy alone in 62(62%) cases while 78(78%) with combined hysteroscopy. Bilateral chromopertubation test was positive in 57(89.06%) cases with primary infertility while only in 21(58.33%) cases with secondary infertility.

**Conclusion:** Diagnostic hysteroscopy is an indispensable tool in the evaluation of infertility.

**Keywords:** Laparoscopy, Hysteroscopy, Infertility

## INTRODUCTION

It is widely accepted that Infertility is a life crisis. The number of couples seeking medical help for infertility is increasing dramatically. Although it is not a physically debilitating disease, infertility may severely affect the couple's psychological harmony, sexual life and social functions.

A clinical definition of infertility by the WHO and ICMART is "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".<sup>1</sup> Some prefer the term Subfertility to describe women or couples who are not sterile but exhibit decreased reproductive efficiency.<sup>2</sup> Primary infertility refers to the inability to give birth either because of not being able to become pregnant, or carry a child to live birth, which may include miscarriage or a stillborn child. Secondary infertility refers to the inability to conceive or give birth when there was a previous pregnancy or live birth.<sup>3,4</sup>

Infertility is a couple oriented disease. Although good documentation of the prevalence of infertility is lacking, it is generally believed that more than 70 million couples suffer from infertility worldwide.<sup>5</sup> The World Health Organization

estimates that 60 to 80 million couples worldwide currently suffer from infertility.<sup>6</sup>

The current evidence indicates a 9% prevalence of infertility (of 12 months) with 56% of couples seeking medical care.<sup>7</sup> Therefore approximate prevalence of female infertility is 5 to 6%, as female infertility accounts for 40-55% (of which ovulatory dysfunction is 40%, tubal and pelvic pathology is 40%, uterine and cervical factors 10%, unexplained 10%).<sup>8</sup> Experience has shown that majority of pelvic pathology in infertile women is frequently not well appreciated by routine pelvic examinations and the usual diagnostic procedures. The ability to see and manipulate the uterus, fallopian tubes, and ovaries during hysteroscopy has made it an essential part of infertility evaluation.

Female infertile patients with normal seminogram, normal hormonal profile and unexplained infertility can have early and subtle causes of infertility which can be missed on USG, HSG, hysteroscopy or laparoscopy alone. Performing hysteroscopy as 'one step procedure' straightway is more fruitful and beneficial as diagnostic and simultaneous therapeutic intervention is possible at the same sitting.

Aims and objectives of the research were to assess etiological factors in infertility by hysteroscopy and to calculate the prevalence of various pathologies in female reproductive tract leading to primary and secondary infertility.

## MATERIAL AND METHODS

It is a cross-sectional observational study conducted on 100 infertile women, anxious to conceive, coming for infertility work-up, excluding male factor infertility with normal hormonal profile and no contraindication to laparoscopy were subjected to diagnostic laparoscopy and hysteroscopy in NIMS Infertility and Research centre, Jaipur over a period of one and half year from jan 2014 to july 2015.

Detailed medical examination of the patient and relevant examination of the husband was done. Only cases with no male factor involving infertility and with normal hormonal profile were taken for this study. The schedule of investigations consisted of basic routine investigation, USG pelvis, HSG, Husband semen analysis, endocrinological investigations. Pre-anaesthetic checkup was done and informed consent was obtained. The hysteroscopy was done in the fol-

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lucular phase of menstrual cycle under general anaesthesia. First hysteroscopy was performed and uterine cavity, bilateral ostia, endocervical canal were carefully evaluated and any abnormal findings were recorded. then on laparoscopy; uterus, tubes, ovaries and general peritoneum was assessed to note any obvious pathology in the form of adhesions, tubercles, endometriosis or any gross deviations from the normal appearances. Chromopertubation done under vision by instilling methylene blue dye intracervically by the assistant working at the perineum who injects the dye via the uterine manipulator or a Leech Wilkinson’s cannula and through the laparoscope the filling of the tubes is noted and spillage of the dye seen from both the fimbrial ends( B/L CPT Positive) or from one end (U/L CPT Positive). Delayed spill and no spill of dye was also recorded.

The patients were kept for a period of 12-24 hours in the hospital post-operatively.

Data was analysed using SPSS 16.0 software. Appropriate statistical tests used according to the quality of data. Graphs and tables were generated using microsoft word and excel.

**RESULTS**

In the present study, out of total 100 infertile patients evaluated, 64 patients (64%) had primary infertility and 36 patients (36%) had secondary infertility. (Fig No. 1)

Table no. 1 is showing association of hysteroscopic findings with type of infertility. On comparing both the groups primary and secondary infertility group with different hysteroscopic findings, 78(78%) cases had normal findings, and 22(22%) cases had abnormal findings on hysteroscopy. We observed that endometrial polyp was the commonest finding in both the group being 4(6.25%) in cases with primary infertility and 3(8.33%) in patients with secondary infertility. We also observed that in primary infertility following hysterscopic findings were more common than in secondary infertility – Uterine anomalies [hypoplastic uterus 1 (1.56%), septate uterus 2 (3.13%) and bicornuate uterus 2 (3.13%)], Submucous fibroid 2 (3.13%), fibroid polyp 1 (1.56%), whereas in secondary infertility, hysteroscopic findings were - Asherman’s 3 (8.33%), cornual block 2 (5.56%), endometrial calcification and non visualization of tubal ostia in 1(2.78%) each.

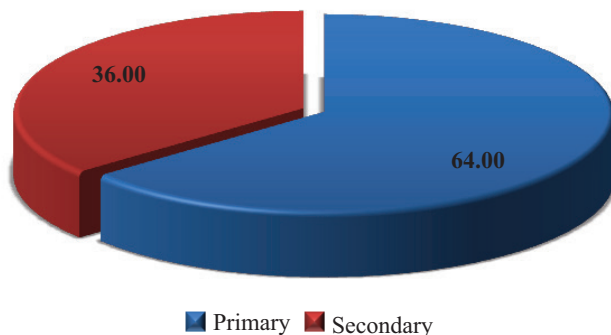
P value comes out to be 0.099 which shows suggestive significance and thus we conclude that hysteroscopy has diagnostic role in infertility.

Table no. 2 is showing association of laparoscopic findings with type of infertility. On comparing both the groups primary and secondary infertility group with different laparoscopic findings, in our study of 100 patients 38 (38%) patients were under normal findings on laparoscopy, and 62 (62%) had abnormal laparoscopic findings. Hence we observed that in primary infertility following laparoscopic findings were more common - PCOD 15 (23.44%), major and minor degree intraperitoneal adhesions 8 (12.5%), endometriosis 6 (9.37%), endometrioma 2 (3.13%), T-O Mass 3 (4.7%); bicornuate uterus, hydrosalpinx, minor tubular structural defects/congestion in 2 (3.13%) each, hypoplastic uterus 1 (1.56%).

Whereas in secondary infertility major and minor degree intraperitoneal adhesions 11 (22.22%), minor tubular structural defects/congestion 7 (19.46%), T-O Mass 4(11.12%), fibroid uterus 3(8.33%), were more common laparoscopic findings. Endometriosis, hydrosalpinx and ovarian cyst was seen in 1(2.78%) cases each.

Table no. 3 is showing association of abnormal findings with various endoscopic modalities. In our study of 100 patients we observed that combined hysterolaparoscopy has better detection rate of abnormalities (78%) than either hysteroscopy (27.77%) or laparoscopy (62%) alone. Hence we conclude that the detection rate of abnormalities increases when combined hysterolaparoscopy is used

We observed that on combined hysterolaparoscopy 45(70.31%)



**Figure-1:** Distribution of cases according to type of infertility

S. No.	Hysteroscopy	Primary		Secondary		Total	
		No.	%	No.	%	No.	%
1	Submucus Fibroid	2	3.13	0	0.00	2	2.00
2	Fibroid Polyp	1	1.56	0	0.00	1	1.00
3	Endometrial Polyp	4	6.25	3	8.33	7	7.00
4	Endometrial Calcification	0	0.00	1	2.78	1	1.00
5	Asherman’s Uterine Synechia	0	0.00	3	8.33	3	3.00
6	B/L Cornual block	0	0.00	1	2.78	1	1.00
7	Lt Cornual block	0	0.00	1	2.78	1	1.00
8	Hypoplastic Uterus	1	1.56	0	0.00	1	1.00
9	Septate Uterus	2	3.13	0	0.00	2	2.00
10	Bicornuate Uterus	2	3.13	0	0.00	2	2.00
11	Non Visualized L Tubal Ostia	0	0.00	1	2.78	1	1.00
12	Normal	52	81.25	26	72.22	78	78.00
	Total	64	100.00	36	100.00	100	100.00

**Table-1:** Association of hysteroscopic findings with type of infertility

abnormalities were seen in cases with primary infertility and 33(91.67%) abnormalities were seen in cases with secondary infertility. The results were statistically significant which was further confirmed by p value significant (p = 0.026) and thus we conclude that combined hysterolaparoscopy is certainly beneficial than either hysteroscopy or laparoscopy alone. (Table No. 4)

**DISCUSSION**

Hysterolaparoscopy is considered the gold standard for diagnosing intrauterine, tubal and peritoneal disease and has nowadays become an integral part of infertility evaluation. Due to increased awareness and eagerness to have a pregnancy, couples are seeking medical help early. In the present study of 100 patients, we observed that the commonest age group was 26 to 30 years (37.5% in group with primary infert-

ility and 38.8% in group with secondary infertility) which coincides with the study of Dhananjay Shobha et al<sup>9</sup> and Samipa J. Shah et al.<sup>10</sup>

The mean age of the study population was 30.03±4.77 years which coincides with the study by Sajeeda Parveen et al<sup>11</sup> and Puri. S et al<sup>12</sup> who reported mean age of infertility 28.4 and 30 years respectively and the mean duration of infertility was 3.68±2.09 years.

In our study of 100 patients, prevalence of primary infertility was 64% while that of secondary infertility was 36% which was similar to the study by Nousheen Aziz<sup>13</sup> and Dr. Samipa J. Shah et al.<sup>10</sup> Various etiological factors in infertility by Hysteroscopy were as follows, 78(78%) patients had normal findings and 22(22%) had abnormal findings. Endometrial polyp was the commonest finding in both the group being 4(6.25%) in cases with primary infertility and 3(8.33%) in

S. No.	Findings	Primary		Secondary		Total	
		No.	%	No.	%	No.	%
1	Minor degree intraperitoneal adhesions	2	3.13	4	11.11	6	6.00
2	Major degree intraperitoneal adhesions						
A	Pelvic tuberculosis	2	3.13	0	0.00	2	2.00
B	T-O Mass with B/L block	1	1.56	1	2.78	2	2.00
C	T-O Mass with U/L block	2	3.13	3	8.33	5	5.00
D	Endometriosis with B/L block	1	1.56	1	2.78	2	2.00
3	Endometriosis without tubal block	5	7.81	0	0.00	5	5.00
4	B/L Endometrioma	2	3.13	0	0.00	2	2.00
5	Rt. Simple Ovarian Cyst	0	0.00	1	2.78	1	1.00
6	PCOD	15	23.44	3	8.33	18	18.00
7	B/L Hydrosalpinx without block	1	1.56	1	2.78	2	2.00
8	Rt. Hydrosalpinx with Rt. tubal block	1	1.56	0	0.00	1	1.00
9	Fibroid Uterus	1	1.56	1	2.78	2	2.00
10	Multiple Fibroid Uterus	0	0.00	2	5.56	2	2.00
11	Bicornuate Uterus	2	3.13	0	0.00	2	2.00
12	Hypoplastic Uterus	1	1.56	0	0.00	1	1.00
13	Minor Tubal Structural Defects/Congestion or distortion						
A	Without Tubal Block	0	0.00	3	8.33	3	3.00
B	With U/L Tubal Block	1	1.56	2	5.56	3	3.00
C	With B/L Tubal Block	1	1.56	2	5.56	3	3.00
14	Normal	26	40.63	12	33.33	38	38.00
	Total	64	100.00	36	100.00	100	100.00

**Table-2:** Association of laproscopic findings with type of infertility

	Abnormal findings in Primary		Abnormal findings in Secondary		Total abnormal findings	
	No.	%	No.	%	No.	%
Hysteroscopy alone	10	15.63	10	30.30	20	27.77
Laparoscopy alone	38	59.38	24	66.67	62	62.00
Combined hysterolaparoscopy	45	70.31	33	91.67	78	78.00

\*Multiple response table

**Table-3:** Association of abnormal findings with various endoscopic modalities

Combined hysterolaparoscopy findings	Primary		Secondary		Total	
	No.	%	No.	%	No.	%
Abnormal	45	70.31	33	91.67	78	78.00
Normal	19	29.69	3	8.33	22	22.00
Total	64	100.00	36	100.00	100	100.00

Chi-square = 4.941 with 1 degree of freedom; P = 0.026

**Table-4:** Association of combined hysterolaparoscopic findings with type of infertility

patients with secondary infertility. We also observed that in primary infertility following hysteroscopic findings were more common than in secondary infertility – Uterine anomalies [hypoplastic uterus 1 (1.56%), septate uterus 2 (3.13%) and bicornuate uterus 2 (3.13%)], Submucous fibroid 2 (3.13%), fibroid polyp 1 (1.56%), whereas in secondary infertility, hysteroscopic findings were - Asherman's 3 (8.33%), cornual block 2 (5.56%), endometrial calcification and non visualization of tubal ostia in 1(2.78%) each.

Thus our findings are coinciding with the study of Suman Puri et al<sup>12</sup> and Dhananjay Shobha et al<sup>9</sup> who reported endometrial polyp being the commonest intrauterine cause. Keya Vaid et al<sup>14</sup> reported endometrial polyp, and congenital uterine anomalies in 6.21% and 4.14% cases respectively. Similarly Sajida Parveen et al<sup>11</sup> reported 9.60% endometrial polyp, 1.60% submucus fibroid, 4.80% uterine anomalies and 3.20% inflamed endometrium.

In our study, on laparoscopy, 62 (62%) had abnormal laparoscopic findings. We observed that in primary infertility following laparoscopic findings were more common - PCOD 15 (23.44%), major and minor degree intraperitoneal adhesions 8 (12.5%), endometriosis 6 (9.37%), endometrioma 2 (3.13%), T-O Mass 3 (4.7%); bicornuate uterus, hydrosalpinx, minor tubular structural defects/congestion in 2 (3.13%) each, hypoplastic uterus 1 (1.56%) whereas in secondary infertility major and minor degree intraperitoneal adhesions 11 (22.22%), minor tubular structural defects/congestion 7 (19.46%), T-O Mass 4(11.12%), fibroid uterus 3(8.33%), were more common laparoscopic findings. Endometriosis, hydrosalpinx and ovarian cyst was seen in 1(2.78%) cases each. Our findings also coincides with the study of Dhananjay Shobha et al<sup>9</sup> and Sajida Parveen et al.<sup>11</sup>

Nousheen Aziz<sup>13</sup> (2007) reported tubal blockage in 21.9% cases with primary infertility and 33.3% cases with secondary infertility. Polycystic ovaries (15.6%), ovarian cysts (6.35), Endometriosis (12.5%), fibroids (6.3%) were seen in cases with primary infertility while endometriosis (11.1%), Pelvic inflammatory disease (16.7%), fibroids (5.6%) seen in cases secondary infertility. Peritubal and periovarian adhesions were detected in 6.3% cases with primary infertility and 22.2% cases with secondary infertility.

Sajida Parveen, et al<sup>11</sup> (2009) stated bilateral tubal patency in 64.5% patients, bilateral tubal blockage in 16.12% and unilateral tubal occlusion in 19.3% cases. Myomas were found in 6.45% (three found on laparoscopy and one at hysteroscopy) . Of total, 8.0% had endometriosis, 19.35% PCOD and 4.8% functional cyst of ovary. Pelvic adhesions in 11.2% patient. As a whole pelvic pathologies were confirmed in 83.8% patients and intrauterine pathology in 27.4%.

Dhananjaya Shobha et al<sup>9</sup> (2014) reported that among primary infertility PCOD was the commonest finding (18.99%) and among secondary infertility, PID was the commonest diagnosis (19.05%). Positive Chromopertubation in 72.15% of women with primary infertility compared to 42.86% cases with secondary infertility.

Suman Puri et al<sup>12</sup> (2015) reported the role of laparohysteroscopy in female infertility and observed 50 patients comprising of 24 (48%) cases of primary infertility and 26 (52%) patients of secondary infertility. Of these, PCOD was detected

in 11 (22%) cases (33.3% primary infertility, 11.5% secondary infertility. Tubal block 7 (29.2), beading/ sacculations 2 (8.3%) and dilatation and hydrosalpinx in 1 (4.1%), TO mass in 1 (4.1%) in the primary infertility group. Among secondary infertility cases findings were - tubal block 2 (7.7%), dilatation and hydrosalpinx 2 (7.7%), sacculation 1 (3.8%), and tubal cyst 1 (3.8%). Endometriosis was detected in 9 (18%) patients, 2 (8.3%) in primary infertility group and 7 (26.9%) in secondary infertility group.

We observed that combined hysterolaparoscopy has better detection rate of abnormalities (78%) than either hysteroscopy (25.64%) or laparoscopy (62%) alone. 12% cases had normal findings on hysterolaparoscopy. Shokeir TA et al<sup>15</sup> also concluded that the rate of diagnosis of significant lesions by laparoscopy of 64.3% rose to 76.6% when the hysteroscopic findings were included.

On chromopertubation test bilateral free spillage was observed in 78% cases, bilateral tubal block in 11%, right tubal block 7%, and left tubal block 4%. Right tubal block was more common than left tubal block in both the groups. Tubal block is important cause of infertility in secondary infertility group observed in 15 cases (41.66%) whereas in 7 cases (10.9%) in primary infertility group. Keya vaid et al<sup>12</sup> reported similar observations, bilateral tubal patent 70.4%, bilateral tubal block in 16%, right tubal block in 9% and left tubal block in 4%. And Dr. Samipa J. Shah et al<sup>75</sup> bilateral tubal patency in 78% cases, bilateral tubal block in 3%, and unilateral tubal block in 13% cases.

## CONCLUSION

Diagnostic hysterolaparoscopy is an effective and safe tool in comprehensive evaluation of infertility and has now been considered as basic skill which should be learnt by every gynaecologist in the advanced scientific era.

Hysterolaparoscopy is the gold standard for diagnosing uterine, tubo-ovarian and peritoneal pathology, because no other imaging technique gives the same degree of sensitivity or specificity. Hence it is an indispensable tool in the evaluation of infertility.

Based on the results of this study we conclude that, while investigating the cause of female infertility, combined simultaneous diagnostic hysterolaparoscopy should be performed in all infertile patients before treatment. The role of hysterolaparoscopy in diagnosis of infertility both primary as well as secondary is established beyond any doubt.

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