

# Hysterolaparoscopy–‘See and Treat’ Infertility, is a Reality in Modern Gynaecological Practice.

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## ABSTRACT

**Background:** : The quest to improve diagnostic and therapeutic capabilities has led to the widespread acceptance of modern gynaecological endoscopy. Hysterolaparoscopy is a basic skill in the advanced scientific era and an effective and safe tool in comprehensive evaluation of infertility with an added advantage of treatment of some pathologies in same sitting. **Methods:** This clinical study is a prospective study of 100 selected cases of infertility. Patients who fulfill the inclusion and exclusion criteria were subjected to diagnostic laparoscopy and hysteroscopy in NIMS Infertility and Research centre, Jaipur over a period of one and half years from Jan 2014 – June 2015. Observation of pelvic and intrauterine cavity and chromopertubation test was done under general anaesthesia during hysterolaparoscopy. Surgical interventions were carried out whenever required and further treatment plan was decided. **Results:** A total of 100 women underwent hysterolaparoscopy. 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%. Among cases with primary infertility commonest pathology responsible were ovarian 20 (31.25%) followed by unexplained 19 (29.69%), uterine 11 (17.18%), tubal 8 (12.50%) and peritoneal 8 (12.50%) whereas in secondary infertility commonest pathology responsible were uterine 14 (38.88%), followed by tubal 13 (36.11%), peritoneal 9 (25%), ovarian 8 (22.22%) and unexplained being the least 2(5.55%). Therapeutic procedures were performed in the same sitting amongst 84.61% cases with primary infertility and 92% cases with secondary infertility. **Conclusion:** When done by experienced hands, with proper selection of patients, hysterolaparoscopy is an indispensable tool which can be considered as a definitive day care procedure for evaluation and treatment of female infertility.

**Keywords:** Laparoscopy, Hysteroscopy, Infertility.

## INTRODUCTION

The quest to improve diagnostic and therapeutic capabilities has led to the widespread acceptance of modern gynaecological endoscopy. Over the last few decades, improved optics and video monitoring systems have encouraged gynaecologists to learn this skill. The ability to view the uterine cavity, pelvic organs and peritubal status has enabled the accurate diagnosis and treatment of numerous conditions. Diagnostic Hysterolaparoscopy is an effective and safe tool in a comprehensive evaluation of infertility with an added advantage of treatment of some pathologies in the same sitting.

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It is now a basic skill in the advanced scientific era. When done by experienced hands, with proper

selection of patients, hysterolaparoscopy can be considered as a definitive day care procedure for evaluation and treatment of female infertility.

Abnormalities of the endometrium and organic intrauterine pathologies are important causes of failed in-vitro fertilization /embryo transfer cycles. A recent meta-analysis has shown potential benefits of performing pre-treatment hysteroscopy in patients being referred for IVF.<sup>[1]</sup> The etiology of recurrent miscarriage is poorly understood. Intrauterine pathology such as fibroids, polyps, Asherman’s syndrome or congenital anomalies can be detected in up to 33% of infertile couples.<sup>[2]</sup>

The inability to procreate is frequently considered a personal tragedy and a curse for the couple, impacting the entire family and even the local community. Negative psychosocial consequences of childlessness are common and often severe.<sup>[3]</sup> NICE guidelines state that: “A woman of reproductive age who has not conceived after 1 year of unprotected vaginal sexual intercourse, in the absence of any known cause of infertility, should be offered a further clinical assessment and investigation along

with her partner. It is recommended that a consultation with a fertility specialist should be made earlier if the woman is 36 years or over, or there is a known clinical cause of infertility or a history of pre-disposing factors for infertility.

The current evidence indicates a 9% prevalence of infertility with 56% of couples seeking medical care.<sup>[4]</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>[5]</sup> WHO estimates the overall prevalence of primary infertility in India to be between 3.9% and 16.8%.<sup>[6]</sup>

Thus, with this background the following study was aimed to evaluate diagnostic hysteroscopy as a must, to “see and treat “various gynaecological pathologies with emphasis on infertility, both primary and secondary.

## MATERIALS AND METHODS

The present study was a prospective study conducted at NIMS infertility and research centre, over a period of one and half years from January 2014 to June 2015. A population of 100 females was selected who underwent simultaneous hysteroscopy during investigation for infertility. Married women of 20 to 40 years of age with primary or secondary infertility, women with suspected pelvic cause of infertility or unexplained infertility were included in the study. Patients with medical disorders that are contraindications for anaesthesia and laparoscopy, active pelvic infections, abnormal hormonal profile,

male factor infertility were excluded from the study. The required consent of the patient was obtained on a study proforma. The demographic data like age, obstetric and other history were recorded on a predesigned and pretested form. Patients fulfilling the above criteria were subjected to diagnostic laparoscopy and hysteroscopy during the follicular phase of menstrual cycle. Observation of pelvic and uterine cavity and chromopertubation test was done using methylene blue dye under general anaesthesia. Surgical interventions were carried out where required and further treatment was decided.

**Data analysis:** In our study of 100 patients, we observed that in primary infertility commonest pathology responsible were ovarian 20 (31.25%) followed by unexplained 19 (29.69%), uterine 11 (17.18%), tubal 8 (12.50%) and peritoneal 8 (12.50%).

Whereas in secondary infertility commonest pathology responsible were uterine 14 (38.88%), followed by tubal 13 (36.11%), peritoneal 9 (25%), ovarian 8 (22.22%) and unexplained being the least 2 (5.55%) [Table 1].

Hence we conclude that ovarian factors are commonly responsible for primary infertility while uterine and tubal factors are commonly responsible for secondary infertility. Multiple factors are responsible for the cause of primary and secondary infertility, and multiple factors were found in the same patient at the same time. Hence needless to emphasize that hysteroscopy is a very useful tool that can diagnose various structural abnormalities, which can be missed otherwise.

**Table 1: Association of prevalence of various pathologies in female reproductive tract with type of infertility.**

S. No.	Causes	Primary (N=64)		Secondary (N=36)		Total (N=100)	
		No.	%	No.	%	No.	%
1	Uterine	11	17.18	14	38.88	25	25.00
2	Ovarian	20	31.25	8	22.22	28	28.00
3	Tubal	8	12.50	13	36.11	21	21.00
4	Peritoneal	8	12.50	9	25.00	17	17.00
5	Unexplained	19	29.69	2	5.55	21	21.00

\*Multiple response table

[Table 2] is showing that the most common intrauterine pathologies in primary infertility group was uterine malformation seen in 5(45.45%) cases (hypoplastic uterus in 1(9.09%), septate in 2(18.18%), bicornuate in 2(18.18%) patients) followed by fibroid uterus 3(27.27%). Endometrial polyps were most common finding in secondary infertility group, seen in 5(35.71%) cases while in 2(18.18%) cases with primary infertility followed by fibroid uterus and asherman's seen in 3(21.42%) cases each.

Fibroid polyp was seen in 1(9.09%) cases with primary infertility and none in secondary infertility. Whereas in secondary infertility, left cornual block, bilateral cornual block and endometrial calcification seen in 1(7.14%) each and none in primary infertility.

Among various ovarian factors responsible for infertility, PCOD was more common finding in primary infertility group 15 (75.00%) than in secondary infertility 3 (37.50%). Bilateral endometrioma was detected in 2 (10%) patients with

primary infertility while none in secondary infertility whereas simple ovarian cyst 1(12.50%) and T-O

Mass 4(50%) were more common in cases with secondary infertility.

**Table 2: Association of various uterine and ovarian factors responsible for infertility with type of infertility.**

	Findings	Primary		Secondary		Total	
		No.	%	No.	%	No.	%
<b>Uterine Factors</b>	Fibroid Uterus(2 on hysteroscopy, 4 on laparoscopy)	3	27.27	3	21.42	6	24.00
	Bicornuate Uterus	2	18.18	0	0.00	2	8.00
	Hypoplastic Uterus	1	9.09	0	0.00	1	4.00
	Endometrial Polyp	2	18.18	5	35.71	7	28.00
	Fibroid Polyp	1	9.09	0	0.00	1	4.00
	Endometrial Calcification	0	0.00	1	7.14	1	4.00
	Asherman's Uterine Synechia	0	0.00	3	21.42	3	12.00
	Lt Cornualblock	0	0.00	1	7.14	1	4.00
	B/L Cornualblocks	0	0.00	1	7.14	1	4.00
	Septate Uterus	2	18.18	0	0.00	2	8.00
	Total	11	100.00	14	100.00	25	100.00
<b>Ovarian Factors</b>	PCOD	15	75.00	3	37.50	18	64.29
	B/L Endometrioma	2	10.00	0	0.00	2	7.14
	Rt. Simple Ovarian Cyst	0	0.00	1	12.50	1	3.57
	T-O Mass	3	15.00	4	50.00	7	25.00
	Total	20	100.00	8	100.00	28	100.00

**Table 3: Association of various tubal and peritoneal factors responsible for infertility with type of infertility.**

	S. No.	Findings	Primary		Secondary		Total	
			No.	%	No.	%	No.	%
<b>Tubal Factors</b>	1	B/L Hydrosalpinx without block	1	12.50	1	7.69	2	9.52
	2	Rt. Hydrosalpinx with Rt. tubal block	1	12.50	0	0.00	1	4.76
	3	T-O Mass with B/L block	1	12.50	1	7.69	2	9.52
	4	T-O Mass with U/L block	2	25.00	3	23.08	5	23.81
	5	Minor Tubal StructuralDefects/ Congestion						
	A	With U/L Tubal Block	1	12.50	2	15.38	3	14.29
	B	With B/L Tubal Block	1	12.50	2	15.38	3	14.29
	C	Without Tubal Block	0	0.00	3	23.08	3	14.29
	6	Endometriosis with B/L block	1	12.50	1	7.69	2	9.52
		Total	8	100.00	13	100.00	21	100.00
<b>Peritoneal factors</b>	1	Minor degree intraperitoneal adhesions	2	25	4	44.5	6	35.3
	2	Major degree intraperitoneal adhesions ( associated with tuberculosis, endometriosis and T-O Mass )	6	75	5	55.5	11	64.7
		Total	8	100	9	100	17	100

[Table 3] is showing that 8 (12.50%) patients with primary infertility and 21(36.11%) patients with secondary infertility had tubal pathologies.

In primary infertility group we observed minor tubal structural defects/ congestion in 2 (25%) and T-O Mass with unilateral tubal block in 2 (25%). T-O Mass with bilateral tubal block, bilateral hydrosalpinx without tubal block, right hydrosalpinx with right tubal block and endometriosis with bilateral block in 1(12.50%) each.

Whereas in secondary infertility group we observed T-O Mass with unilateral tubal block in 3(23.08%), T-O Mass with bilateral tubal block in 1(7.69%), bilateral hydrosalpinx in without tubal block in 1(7.69%), endometriosis with bilateral block in 1(7.69%) and minor tubal structural defects/ congestion in 7(53.84%).

Among pelvic pathologies, minor degree intraperitoneal adhesions were present in 2(25%) patients with primary infertility and 4(44.44%)

patients with secondary infertility. Major degree of adhesions was present in 6(75%) patients with primary infertility and 5(55.56%) patients with secondary infertility.

As shown in [Table 4], different laparoscopic and hysteroscopic procedures were performed in the same sitting amongst 84.61% cases with primary infertility and 92% cases with secondary infertility. Interventions like intrauterine adhesiolysis, intraperitoneal adhesiolysis, polypectomy, ovarian cystectomy, fulguration of endometriotic patches and cyst wall ablation of endometrioma were done in 100% cases among both primary and secondary infertility.

Intrauterine myomectomy was done in 66.66% cases (100% in primary infertility and 50% in secondary infertility) while intramural myomectomy in 75% cases (100% in primary infertility and 66.66% in secondary infertility) and ovarian drilling in 61.11% cases (60% in primary infertility and 66.66% in

secondary infertility). Thus, we conclude that hysterolaparoscopy is a safe and simple surgical procedure in diagnosis and

management of female infertility cases in expert hands.

**Table 4: Different Laparoscopic and Hysteroscopic therapeutic procedures done in the same sitting.**

S. No.	Surgical Procedure	Primary Infertility (n=64)		Secondary Infertility (n=36)		Total No. with % age	
1	Intrauterine Adhesiolysis	0	-	3/3	100%	3/3	100%
2	Polypectomy (2 endometrial, 1 fibroid polyp)	3/3	100%	5/5	100%	8/8	100%
3	Intrauterine Myomectomy	2/2	100%	0	2/4	4/6	66.66%
4	Intraperitoneal Adhesiolysis	8/8	100%	9/9	100%	17/17	100%
5	Ovarian Drilling	9/15	60%	2/3	66.66%	11/18	61.11%
6	Ovarian Cystectomy	0	-	1/1	100%	1/1	100%
7	Salpingectomy (in Hydrosalpinx)	2/2	100%	1/1	100%	3/3	100%
8	Intramural Myomectomy	1/1	100%	2/3	66.66%	3/4	75%
9	Fulguration of endometriotic patches	6/6	100%	1/1	100%	7/7	100%
10	Cyst wall ablation (Endometrioma)	2/2	100%	0	-	2/2	100%
	Total cases	33/39	84.61%	24/26	92%	57/65	87.7%

## 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 infertility and 38.8% in group with secondary infertility) which coincides with the study of Dhananjay Shobha et al<sup>[8]</sup> and Samipa J. Shah et al<sup>[9]</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>[10]</sup> and Puri. S et al<sup>[11]</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>[12]</sup> and Dr. Samipa J. Shah et al<sup>[9]</sup>.

In the present study of 100 patients we observed that unexplained infertility was found in 21 cases (21%), more common in primary infertility group 19 cases (29.69%) compared to secondary infertility group 2 cases (8.33%) which coincide with the study of Sawaranalata Samalet al<sup>[13]</sup> who reported unexplained infertility in total 18 cases (18%).

We observed that ovarian factors (PCODS, bilateral endometrioma, ovarian cyst and T-O Mass) accounted for 28% of cases. Among which 20 (31.25%) cases were of primary infertility and 08 (22.22%) were of secondary infertility. PCOD 15(75%) was more common in primary infertility whereas T-O Mass 4(50%) was more common in secondary infertility.

Samipa J. Shah et al<sup>[9]</sup> reported that ovarian factors are responsible for 31% cases of infertility while Sawaranalata Samal et al<sup>[13]</sup> reported that ovarian factors accounted for 27% cases among which 19 (25.33%) were of primary infertility and 08 (32%) were of secondary infertility. Our findings also coincide with the study of Nousheen Aziz<sup>[12]</sup>, Sumanpuri et al<sup>[11]</sup> and Sajidaparveen et al<sup>[10]</sup> who reported PCOD being commonest ovarian factor among cases with primary infertility.

Uterine causes was found in 25 cases (25%) among which 11 cases (17.18%) were of primary infertility and 14 cases (38.88%) were of secondary infertility. Sawaranalata Samal et al<sup>[13]</sup> reported that uterine factors accounted for 14% cases among which 13.3% were of primary infertility and 16% were of secondary infertility while Samipa J. Shah et al<sup>[9]</sup> reported that uterine factors are responsible for 40% cases of infertility. Thus, we conclude that uterine factors are important cause of infertility and hence hysteroscopy has a major role in diagnosis of infertility.

Mean prevalence of uterine malformation in general population is 4.3% and in infertile patients 3.5%. The incidence of uterine anomaly is 7.6%. In our study prevalence of uterine malformation was 5% in contrast to study by Sajida Parveen et al<sup>[10]</sup> who reported 12.9%. The incidence of myoma in women with infertility without any obvious cause of infertility is estimated to be 1-2.4%. Prevalence of myoma in our study comes out to be 4% (2 on hysteroscopy and 2 on laparoscopy).

Tubal causes was found in 21 cases (21%) among which 08 cases (12.50%) were of primary infertility and 13 cases (36.11%) were of secondary infertility. Sawaranalata Samal et al<sup>[13]</sup> reported that tubal factors accounted for 34% cases among which 37.33% were of primary infertility and 24% were of secondary infertility while Samipa J. Shah et al<sup>[9]</sup>

reported that tuboperitoneal factors are responsible for 38% cases of infertility.

Peritoneal causes was found in 17 cases (17%) among which 08 cases (12.50%) were of primary infertility and 09 cases (25%) were of secondary infertility. Our findings does not coincide with the results of Sawaranalata Samal et al<sup>[13]</sup> who reported the study on 100 cases and observed that peritoneal factors accounted for 7% cases among which 6.66% were of primary infertility and 08% were of secondary infertility. Reason may be as our present study included various major and minor degree adhesions associated with T-OMass, ednometriosis and pelvic tuberculosis which was not observed and mentioned in the study of Sawaranalata Samalet al.<sup>[13]</sup>

Although exact prevalence of endometriosis in general population of reproductive age is not known, it is believed to be in the range of 3-10%.<sup>[10]</sup>In our study it comes out to be 8% which is similar to the study by Sajida Parveen et al.<sup>[10]</sup>

On Chromopertubation test we observed 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 then 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.

Thus our findings coincide with the study of keyavaid et al<sup>[7]</sup> who reported similar observations bilateral tubal patent 70.4%, bilateral tubal block in 16%, right tubal block in 9% and left tubal block in 4%. Our findings also coincide with the study of Dr. Samipa J. Shah et al<sup>[9]</sup> who reported similar observations bilateral tubal patency in 78% cases, bilateral tubal block in 3%,and unilateral tubal block in 13% cases and also with the study of Sajida Parveen et al<sup>[10]</sup> who reported bilateral tubal patency in 64.5% and bilateral block in 16.2%.

Different laparoscopic and hysteroscopic procedures were performed in the same sitting amongst 84.61% cases with primary infertility and 92% cases with secondary infertility thus we conclude that hysterolaparoscopy is a safe and simple surgical procedure in diagnosis and management of female infertility cases in expert hands.<sup>[21]</sup>

## CONCLUSION

Gynaecological endoscopic surgery has revolutionized in the past few decades. Endoscopic surgery for infertility, when performed by an experienced endoscopist, is a boon to the suffering patient and can produce much better results than traditional procedures.

Hysterolaparoscopy should remain the primary diagnostic endoscopic procedure in the routine surgical assessment and management of infertile

women. Definitive surgical procedures like adhesiolysis, ovarian drilling, ovarian cystectomy, myomectomy, polypectomy can be done together with diagnosis to increase the fertility rate at a shorter interval of time.

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