

# Pan Endoscopic Approach “Hysteroscopy” as an Initial Procedure in Selected Infertile Women

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## ABSTRACT

**Introduction:** Tuboperitoneal pathology is responsible for 40-50% cases of infertility. Hysterosalpingography (HSG) & laparoscopy are the two classic methods available for evaluation of tubal pathology and are complementary to each other. Though pelvic sonography and HSG are good enough to exclude gross intrauterine pathology, but subtle changes in the form of small polyps, adhesions and seedling fibroid are better picked up on magnification with hysteroscopy. Combined hysteroscopy may obviate need for HSG, as complete evaluation and treatment is possible in the same sitting.

**Aim:** To assess the utility of Hysteroscopy as one step procedure and compare it with HSG, in the subset of ovulatory infertile women with normal pelvic sonography / seminogram / hormonal assays.

**Materials and Method:** In this analytical prospective study, 193 infertile women aged 19 to 42 years underwent HSG and Hysteroscopy over a period of six months. They were confirmed to have ovulatory cycles and normal seminogram. Patient with active genital infection were excluded. Findings were categorized as normal/abnormal and therapeutic intervention done, if required. Statistical evaluation was carried out using Chi-square test.

**Result:** On comparing HSG and Hysteroscopy, uterine findings matched in 66.3% patients. HSG failed to detect uterine pathology in 32.12% patients (62/193) with a sensitivity of 21.3% and specificity of 97.45%. Ninety three percent of intrauterine adhesions/polyps were missed on HSG. Hysteroscopic intervention was required in 23.83% cases, adhesiolysis being the commonest. On comparing tubal patency on HSG and laparoscopy, the sensitivity of HSG in detecting bilateral tubal block was 80.6% and specificity of 81.5%. With regard to unilateral tubal block, sensitivity was 34.6% and specificity 89.8%. The agreement between the two was 74%. Pathology such as adhesions, fimbrial agglutination and endometriosis were dealt surgically in 65.8% patients. As per HSG, 112/193 women had both tubes patent and 177 revealed normal uterine cavity. When these 112 women (58.03%) with normal HSG report were further subjected to hysteroscopy, only 35/193 (18.13%) of them actually had normal tubes and uterus; rest 77 women (39.89%) were benefited by one step procedure of hysteroscopic evaluation and intervention and further treatment done.

**Conclusion:** Hysteroscopy (Pan Endoscopic) approach is better than HSG and should be encouraged as first and final procedure in selected infertile women.

**Keywords:** Infertility, Hysteroscopy, Laparoscopy, Hysterosalpingogram

## INTRODUCTION

Infertility is defined as failure of a couple in becoming pregnant after having regular, unprotected intercourse for one year. It affects approximately 10-15% of couples. Tuboperitoneal pathology is responsible for infertility in 40-50% of the cases, while uterine pathology accounts for 15-20% of cases. Other factors include ovulatory dysfunction (30-40%) and male factor (30-40%) [1,2]. HSG and laparoscopy are the two classic methods which are available for evaluation of tubal pathology and they are complementary rather than mutually exclusive and each has advantages and disadvantages. Though pelvic sonography and HSG are good enough for excluding gross intrauterine pathology, subtle changes in the form of small polyps, adhesions and sub-endometrial fibroid seedling, which influence fertility, can be missed. These subtle changes are better picked up on magnification with hysteroscopy. In infertile women with ovulatory cycles, normal sonographies and normal seminogram reports, possibility of tuboperitoneal factors and subtle endometrial changes are quite high.

Since laparoscopy is an important method of evaluation, combining it with hysteroscopy at the same sitting (one step procedure) may obviate the need for HSG in this subset of infertile women. In addition to being diagnostic, this procedure may be utilized for therapy and prognostication. Thus, the entire procedure becomes “prognostic

and therapeutic oriented rather than only diagnostic”. There are only few studies in literature, which have compared the pan endoscopic approach with HSG, which have shown no consistency [3-7]. Keeping this in view, the present study was designed to assess the utility of hysteroscopy in this subset of infertile women, as single step procedure, to let go the need for HSG!

## AIMS AND OBJECTIVES

To assess the utility of hysteroscopy as one step procedure and to compare it with HSG, in subset of ovulatory infertile women with normal pelvic sonographies /seminogram/hormonal assays.

## MATERIALS AND METHODS

This was an ‘Analytical Prospective Study’ which was conducted in the Department of Obstetrics and Gynaecology of a premiere hospital in Delhi. The sample size included 193 infertile women from outpatients clinic. Prior ethical clearance was obtained from institutional ethical committee of the hospital for conducting this study.

Inclusion criteria were women who were aged 19-42 years, who had infertility which was defined as per WHO criterion, confirmed ovulatory cycles, normal serum levels of TSH, Prolactin, FSH, LH and normal seminogram reports. Patients with active genital

Uterine findings	No. (193)	%
Cavity normal	177	91.7
Cavity abnormal	16	8.29
Filling defect	06	3.10
Septate uterus	04	2.07
Irregular cavity	03	1.55
Small uterus	02	1.03
Large uterus	01	0.51

[Table/Fig-1]: Uterine findings on HSG

Uterine findings	No. (193)	%
Normal	118	61.1
Abnormal*	75	38.86
Ostial (fibrosed / blocked)	29	15.02
Intrauterine adhesions	23	11.91
Polyp / myoma	12	6.21
Endometrial (calcified / inflamed/irregular)	7	3.62
Septum	5	2.59
Small uterus	3	1.55

[Table/Fig-2]: Uterine findings on hysteroscopy  
\*Findings occurred alone or in combination

HSG	Hysteroscopy		
	Normal	Abnormal	Total
Normal	115 (TN)	62 (FN)	177
Abnormal	3 (FP)	13 (TP)	16
Total	118	75	193

[Table/Fig-3]: Comparison of uterine findings of HSG vs hysteroscopy

Laparoscopy CPT	HSG				
	Both patent	Both blocked	Right blocked	Left blocked	Total
Both patent	109 (TN)	14(FP)	6 (FP)	7 (FP)	136
Both blocked	2 (FN)	25(TP)	2 (FN)	2 (FN)	31
Right blocked	1 (FN)	11(FP)	6 (TP)	0	18
Left blocked	0	5(FP)	0	3 (TP)	8
Total	112	55	14	12	193

[Table/Fig-4]: Comparison of tubal patency on HSG vs laparoscopic chromopertubation

Additional findings*	No. of patients (193)	(%)
Pelvic adhesions	65	33.67
Fimbrial Agglutination	31	16.02
Pelvic endometriosis	30	15.54
Fimbrial cyst	19	9.84
PCOD	10	5.18
Beaded tube	8	4.14
TO mass	7	3.62
Myomas	6	3.10
Peritoneal Adhesions	6	3.10
Hydrosalpinx	5	2.59
Ovarian cyst	2	1.03
Accessory tube	2	1.03

[Table/Fig-5]: Additional findings on laparoscopy  
\*Findings occurred alone or in combination

Interventions	Number*	% (193 patients)
Adhesiolysis	71	36.78
Fimbrioplasty	50	25.9
Surgery for endometriosis	29	15.02
Neosalpingostomy	10	5.18
Fimbrial cystectomy	16	8.29
Ovarian drilling	10	5.18
Ovarian cystectomy	2	1.03
Salpingectomy	2	1.03

[Table/Fig-6]: Laparoscopic interventions  
\*More than one procedure performed per patient

Interventions	No. of patients
Adhesiolysis	20
Polypectomy	10
Adhesiolysis + Polypectomy	1
Hysteroscopic cannulation	8
Adhesiolysis + Hysteroscopic cannulation	1
Septum resection	4
Metroplasty	1
Removal of calcified tissue	1
Total	46

[Table/Fig-7]: Hysteroscopic interventions

infections or any contraindications to HSG or hysterolaparoscopy were excluded. Infertility was defined as inability in conceiving despite having unprotected intercourse for one year. After taking informed written consents, detailed histories of the patients, general physical and gynaecological examinations were done on them and they were recorded in a pre-designed proforma. Basic tests such as husband semen analysis, hormonal assays, pelvic ultrasonography and premenstrual endometrial biopsies were carried out and the study group was selected with regards to appropriate inclusion and exclusion criteria.

Each patient underwent HSG and then hysterolaparoscopy over a period of six months.

HSG was performed in the preovulatory phase of the menstrual cycle (Day 6-11, preferably D-8) as an OPD procedure. Pre procedural antibiotic prophylaxis was given to patients with history of pelvic inflammatory disease or suspected tubal pathology, whereas all patients received antibiotic prophylaxis after the procedure. Approximately 10-15 ml of water soluble contrast media (urografin) was instilled manually through leech-Wilkinson's cannula. Three supine radiographs were taken, one during filling up of uterus, second during filling of tubes and third during occurrences of peritoneal spills.

Hysterosalpingographs were evaluated by a radiologist who was blinded to the results of other tests. HSG was interpreted as normal or abnormal, based on the presence of filling defect, shape of cavity, septum, etc. For tubal status, HSG was reported to be normal, when both tubes were well outlined by free flow of dye, without any loculation. HSG was labeled as abnormal, when there was evidence of unilateral or bilateral tubal obstruction. Tubal blocks were further classified as cornual, mid tubal or fimbrial, depending on the extent of dye which entered the tube.

Hysterolaparoscopy was carried out in the follicular phase of the menstrual cycle (Day 7-8) on in-patient basis under general anaesthesia, as one step procedure. Storz laparoscope (10 mm diameter) was introduced after creating pneumoperitoneum intraumbilically and thorough inspections of uterus, anterior and posterior cul-de-sacs, fallopian tubes, ovaries, ovarian fossae and

rest of the pelvic peritoneum, appendix and liver surface were performed and any abnormality which was seen was noted down, including adhesions if there were any. Chromopertubation was done in all the cases. Therapeutic interventions were done at the same sitting, in the form of adhesiolysis, fimbrioplasty, ablation of endometriotic spots, cystectomy, if they were required.

Storz hysteroscope (5 mm diameter) was used for diagnostic hysteroscopy. Hysteroscope was introduced and the cervical canal, uterine cavity, endometrium and both ostia were thoroughly inspected. Therapeutic interventions in the form of synechiolysis, polypectomy, cannulation were done by using ten mm operative hysteroscope.

Outcome measures were (a) HSG findings were compared with hysteroscopic findings for understanding uterine pathology, (b) HSG findings were compared with laparoscopic findings for understanding tubal pathology and pelvic adhesions, endometriosis or any other pathology, (c) Therapeutic interventions were performed during hysteroscopy, (d) Efficacy of pan endoscopy was compared with that of HSG for managing cases of female infertility.

The data was analyzed by using SPSS software. Comparison between HSG and Hysteroscopy was done by using Chi-square test.

## RESULTS

Most of the women were around 30 years of age (mean age  $29.78 \pm 4$  years) and they had reported to this hospital after a period of infertility (mean duration  $3.86 \pm 2.68$  years). Sixty six percent women had primary infertility and 34 % had secondary infertility. No complications were associated with either procedure.

As has been shown in [Table/Fig-1-3], HSG was unable to detect abnormalities in uterine cavity in 62 (32.12%) patients. It showed concurrence (TN+TP) with hysteroscopy in 128/193 (66.3%) cases.

As per [Table/Fig-4] sensitivity of HSG for detection of bilateral tubal block was 80.6%, specificity was 81.5%, positive predictive value was 45.5% and the negative predictive value was 95.7%. Sensitivity of HSG in detection of unilateral tubal block was 34.6%, specificity was 89.8%. For both unilateral and bilateral tubes, the difference between HSG and laparoscopy was highly significant ( $p < 0.0001$ ), with laparoscopy being more superior than the former method.

[Table/Fig-5] depicts additional findings that were observed in 127/193 (65.8%) women on laparoscopy. [Table/Fig-6,7] depict laparoscopic and hysteroscopic surgical interventions that were done at the same sitting.

## DISCUSSION

Ovulatory infertile women with normal seminograms, pelvic ultrasound findings and hormonal profiles have higher possibility of having tuboperitoneal and subtle endometrial pathologies. These women face a lot of anxiety, emotional and financial trauma on undergoing series of procedures like HSG, laparoscopy and hysteroscopy over a period of time, before being referred for ART. Performing hysteroscopy as 'one step procedure' straightaway in these women may be more fruitful. At first glance, hysteroscopy may appear to be costlier, invasive and it may require anaesthesia, but in the long run, it may become more beneficial, as therapeutic interventions can be done at the same sitting, as well as decisions for ART can be taken in time.

There are few similar study reports which are available in the literature, which have no consistency [3-7].

### Comparison of HSG with Hysteroscopy

The enthusiasm for hysteroscopy has been based on the assumption that it is able to pick up small intrauterine lesions that may not otherwise be readily diagnosed by HSG. In our study, HSG failed

to detect uterine pathology in 32.12% patients (62/193), with a sensitivity of 21.3%, specificity of 97.45%, negative predictive value of 64.97% and positive predictive value of 81.25%. The agreement between HSG and hysteroscopy was 66.3%. Similar results were demonstrated by LaSala et al., [4], with a low false positivity of 10% and a high false negativity of 26% with HSG. However, Snowden et al., [3] observed a false positive rate of 31% and a false negative rate of 1.3% in a study which was conducted similarly. Otubu et al., [5], in their study, obtained a false positive rate of 25% and a false negative rate of 30.40%, while Giacomucci et al., [6] reported a false positive rate of 5.2% and a false negative rate of 69.90%. In the study of Hourvitz et al., [7], false positive rate of 19% and a false negative rate of 12% were reported.

The abnormal findings which were detected on hysteroscopy were dealt with therapeutically at the same sitting in 23.83% (46/193) patients. This was a significant advantage of hysteroscopy over HSG.

### Comparison of HSG with Laparoscopy for Tuboperitoneal Factors

Laparoscopy is regarded as the most definitive test for the evaluation of tubal factors. Not only does it provide vital information regarding both apparent and undiagnosed pathologies, it also gives an opportunity to treat them at the same sitting.

In study of Snowden et al., [3], the false negative rate of HSG was 13% and its false positive rate was 16%. Similarly, La Sala et al., [4] showed a sensitivity of 64.5%, specificity of 63.3%, false negative rate of 35.5% and a false positive rate of 37.7%. Otubu et al., [5], in their study, obtained a false positive rate of 9% and a false negative rate of 8%, while Hourvitz et al., [7] reported a false positive rate of 12% and false negative rate of 19%.

### Hysterosalpingography versus Hysteroscopy as "One Step" Procedure

HSG revealed that both tubes of 112/193 women were patent and that 177 women had normal uterine cavities. These 112 women (58.03%) with normal HSG reports would have gone for further treatment, but with hysteroscopy only, 35/193 (18.13%) women were declared to have normal tubes and uteri. These 77 women (39.89%) were benefited by one step procedure of hysteroscopic intervention and they were advised further treatment in the form of superovulation with IUI for 3-6 cycles. In addition, 19/193 women (9.84%) where tubal patency could not be restored on hysteroscopic intervention, were referred for IVF-ET without any further delay. Rest of the women with corrected pathologies on hysteroscopy, were given trials for spontaneous conceptions for a period of 6 months.

## CONCLUSION

Hysteroscopy is far superior to HSG, as it is more accurate and therapeutic intervention is possible at the same time. In selected infertile women, where other causes are excluded and tuboperitoneal pathology is strongly suspected, hysteroscopy may be recommended as the first and final procedure, rather than subjecting the patients to two procedures. Also, it will be possible to prognosticate and segregate the patients who will need ART and they can be referred at the earliest, thus avoiding further emotional and financial trauma to the couples.

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