

## Evaluation of cases of infertility by endometrial biopsy, hysterosalpingography and diagnostic laprohysteroscopy

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### Abstract

**Introduction:** This study was conducted to evaluate cases of infertility by endometrial biopsy, hysterosalpingography (HSG) and diagnostic laparohysteroscopy. **Methods:** In this study, 100 infertile women (primary and secondary infertility) were thoroughly evaluated and investigated systematically to know the cause of infertility. Premenstrual endometrial biopsy, HSG diagnostic laparohysteroscopy was done in all patients. **Results:** Premenstrual endometrial biopsy revealed proliferative endometrium in 24%, endometritis in 3%, tubercular endometritis in 4% and adenomatous hyperplasia in 5% cases. On HSG, bilateral tubal block was found in 36% cases while on laparochromopertubation only 25% cases. 73% cases had abnormal findings on laparoscopy, out of them pelvic adhesions were most common (22%). HSG detected hydrosalpinx, congenital anomalies of uterus and tubes, T.B findings significantly. 47% cases had positive findings on hysteroscopy and intrauterine synechiae was most common (17%). **Conclusion:** No procedure is substitute for other and all are complementary to each other with specific role of endometrial biopsy for ovulation detection and endometrial bed pathology, HSG and laparochromopertubation for tubal patency, laparoscopy for pelvic pathology and hysteroscopy for intrauterine pathologies.

**Keywords:** Infertility, endometrial biopsy, hysterosalpingography and diagnostic laparohysteroscopy.

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### Introduction

“Fertility is considered to be divine gift and inability to procreate children, a curse of mankind”. The desire for a child is normal phenomenon of normal married couple. Childlessness is generally tragedy for the married women: and can cause marital disturbances as well as personal unhappiness and ill health. An infertility diagnosis can distort our basic definition of womanhood and manhood, however, temporarily. Infertile couples often feel guilty; shame, anger and inferior; with pressure from family and friends frequently adding to their anxiety and emotional disturbance. It is no wonder, therefore, that many infertile patients willingly accept lengthy evaluations diagnostic studies; and various medical and surgical treatment. Conception is the result of successful fertilization of female egg by the sperm. Hence the couple should be counseled individually and then together because both partners contribute varyingly to the occurrence infertile state. It is popular misconception to attribute failure solely to the female. Hence it is mandatory to investigate both partners simultaneously, carry out necessary tests and adopt appropriate measures to enhance the fertility potential of each individual partner.

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Aim of present study was to evaluate cases of infertility by endometrial biopsy, hysterosalpingography and diagnostic laprohysteroscopy.

### Material & methods

After approval from institutional ethical committee and informed consent from patients, present study was carried out in 100 infertile couples attending the OPD of Upper India Sugar Exchange Maternity Hospital attached to G.S.V.M. Medical College, Kanpur during the period December, 2006 to August, 2008. The study included the infertile couple of various age group and varying duration of primary and secondary infertility. A detailed history of both partners was taken followed by complete examination and routine investigation. Endometrial biopsy, ultrasonography, HSG and diagnostic laprohysteroscopy was performed in all 100 patients and role of each procedure was evaluated.

### Results

In this study secretory changes (ovulatory changes) were observed in 54.28% and 50% cases of primary and secondary infertility cases respectively (table 1). Anovulatory changes were observed in 31.4% cases and 26.7% cases of primary and secondary infertility respectively. Tubercular endometritis was observed in 2 (2.9%) cases and 2 (6.7%) cases of primary and secondary infertility respectively. In 5 % cases deficient endometrium or inadequate smear was found.

**Table 1: Distribution of cases of infertility on histopathological report of endometrial biopsy**

Sl. No.	Type of endometrium	Primary infertility		Secondary infertility	
		No. of cases	%	No. of cases	%
1.	Secretory (ovulatory)	38	54.28	15	50
2.	Proliferative	18	25.71	6	20
3.	Mixed reaction	4	5.71	2	6.7
	Anovulatory				
4.	Endometritis	2	2.86	1	3.3
5.	Tubercular endometritis	2	2.86	2	6.7
6.	Adenomatous hyperplasia	3	4.29	2	6.7
7.	Deficient endometrium	3	4.29	2	6.6
	Total	70	100.00	30	100

Laparochromopertubation was done to confirm tubal block which were detected in 36 (36%) cases on HSG and out of these, only 24 (24%) cases were found to have bilateral tubal blockage on laparochromopertubation (table 2). In contrast one case found to have patent tube on HSG was found to be blocked on Laparochromopertubation, thus HSG gave 96% sensitivity in diagnosing blocked tubes, and specificity of 84% regarding laparoscopy as reference standard.

**Table 2: Comparison of tubal patency diagnosed by hysterosalpingography and laparochromopertubation**

Laparochromopertubation	Blocked tubes	Patent tubes	Total
HSG			
Blocked tubes	24	12	36
Patent tubes	1	63	64
Total	25	75	100

**Table 3 : Distribution of cases according to pathological Findings diagnosed at laparoscopy**

Findings	No. of cases (N=100)	%
Congenital anomalies of uterus and tubes	3	3
Endometriosis	4	4
Fibromyoma	2	2
Findings suggestive of tuberculosis	4	4
Hydrosalpinx	17	17
Ovarian cyst	13	13
Pelvic adhesions	22	22
Thickened fibrosed fallopian tube	6	6
Tubo-ovarian mass	4	4
Uterine hypoplasia	2	2
Normal study	27	27

In our study 100 cases underwent laparoscopic evaluation. Out of 100 in 22 (22%) cases pelvic adhesions were found; Hydrosalpinx in 17 (17%) cases; thickened fibrosed fallopian tube in 6 (6%) cases; ovarian cyst in 13 (13%) cases, congenital anomalies in 3(3%) cases, endometriosis in 4(4%) cases, uterine hypoplasia in 2 (2%) cases, findings suggestive of tuberculosis in 4 (4%) cases, tubo-ovarian mass in 4 (4%) cases, fibromyoma in 4 (4%) cases and 27 (27%) cases had normal study (table 3). In this study pelvic adhesions were

detected in 22 (22%) cases at laparoscopy and 2 (2%) cases at HSG. Hydrosalpinx in 17(17%) cases at laparoscopy and in 15 (15%) cases at HSG. At laparoscopy tuboovarian mass detected in 4 (4%) cases, ovarian cyst in 13(13%) cases, endometriosis in 4 (4%) cases but no case of tuboovarian mass, ovarian cyst and endometriosis was detected at HSG. At HSG 1 (1%) case had intrauterine synechiae but no such case was detected at laparoscopy (table 4).

**Table 4: Comparison of HSG and Diagnostic Laparoscopic Findings of Pelvic Pathology**

Findings	HSG(N=100)		Diagnostic laparoscopy(N=100)	
	No. of cases	%	No. of cases	%
Congenital anomalies	2	2	3	3
Endometriosis	-	-	4	4
Fibroid / polyp	-	-	2	2
Findings suggestive of tuberculosis	3	3	4	4
Hydrosalpinx	15	15	17	17
Intrauterine synechiae	1	1	-	-
Ovarian cyst	-	-	13	13
Pelvic adhesions	2	2	22	22
Thickened fibrosed fallopian tube	0	0	6	6
Tuboovarian mass	-	-	4	4
Uterine hypoplasia	2	2	2	2

In our study on hysteroscopy intrauterine adhesions were found in 17(17%) cases atrophic endometrium in 7(7%) and endometritis in 5(5%). Submucous myoma in 3(3%); polyp in 1(1%) cases; septate uterus in 2(2%) and hypoplastic uterus in 2%; fibrosed ostia were found in 9(9%) cases and no abnormality was detected in 53(53%) cases (table 5).

**Table 5: Distribution of Cases According To Pathological Findings of Uterine Cavity On Hysteroscopy**

Pathology	No. of cases	%
Intrauterine synechiae	17	17
Polyps	1	1
Submucous myoma	3	3
Atrophic endometrium	7	7
Endometritis	5	5
Septate uterus	2	2
Hypoplastic uterine cavity	2	2
Fibrosed ostia	9	9
Normal study	53	53

In this study of 100 patients (table 6), intrauterine adhesions was found in 17(17%) on hysteroscopy and only 1(1%) case was detected on HSG. Submucous myoma and polyp was detected in 3(3%) and 1(1%) cases during hysteroscopy, and 1(1%) and no cases during HSG respectively. Atrophic endometrium and endometritis was detected in 7(7%) cases and 5(5%) cases on hysteroscopy respectively but no case was reported on HSG. Septate and hypoplastic uterus was found in 2 (2%) and 2(2%) cases respectively on hysteroscopy and 1(1%) and 2(2%) cases on HSG. One case of Bicornuate uterus was found on HSG but no case was detected on hysteroscopy. Fibrosed ostia was found on 9(9%) cases on hysteroscopy and in 36(36%) cases on HSG bilateral tubal block tubes were found.

**Table 6: Comparison of Hsg and Diagnostic Hysteroscopic Findings of Uterine Cavity**

Pathology	HSG (N=100)		Hysteroscopy (N=100)	
	No. of cases	%	No. of cases	%
Intrauterine synechiae	1	1	17	17
Polyp	0	0	1	1
Submucous myoma	1	1	3	3
Atrophic endometrium	0	0	7	7
Endometritis	0	0	5	5
Bicornuate uterus	1	1	-	-
Septate uterus	1	1	2	2
Hypoplastic uterine cavity	2	2	2	2
Blocked ostia	36	36	9	9

## Discussion

In a country like India; infertility is a social stigma of the highest degree directed against women. Infertility is a multifactorial problem. In addition to the evaluation of factors responsible for infertility our study lays special emphasis on role of endometrial biopsy, hysterosalpingography, laparoscopy and hysteroscopy in the female infertility. According to Table 1 in this study secretory changes (ovulatory changes) were observed in 54.28% and 50% cases of primary and secondary infertility respectively. Anovulatory changes were observed in 31.4% and 26.7% cases of primary and secondary infertility respectively. Tubercular endometritis was reported in 2(2.9%) and 2(6.7%) cases of primary and secondary infertility respectively. In 5 (5%) cases adenomatous hyperplasia and in 5(5%) cases deficient endometrium or inadequate smear was found. Baijal L et al (1980)<sup>1</sup> studied upon cytological and clinicopathological study of endometrium in cases of infertility and found secretory endometrium in 65% cases, non-secretory in 16.5% cases; non secretory with cystic hyperplasia in 1%; endometrial tuberculosis in 4% and inadequate smear in 13.5% cases. According to Table 2, on comparing tubal patency diagnosed by HSG and laprochrom-opertubation, it was found that sensitivity and specificity of HSG in diagnosing tubal block was 96% and 84% respectively. We had false positive result in 12% cases. Sensitivity of our results were comparable with those of Allahabadia G et al (1992). Specificity of our results were not comparable because of high false positive results due to tubal spasm, technical errors etc. The relatively higher rate of tubal occlusion on HSG has been attributed (by Siegler<sup>3</sup>1983) to (a) occurrence of utero-tubal spasm during HSG (b) intramural passage of dye due to false passage as cannula may get buried in the myometrium (c) closure of ostium of fallopian tubes as a result of

hyperplastic mucosal fold of endo-salpinx (d) trapping of dye in presence of intrauterine synechiae. Our results were comparable with Stephen and Corsen<sup>4</sup>(1979); he found gentle technique to avoid cornual spasm; agreement with laparoscopy should be in excess of 70% and with Donnez J et al<sup>5</sup> (1982) who said these 2 technique are comparable in 88% cases. In our study endometriosis detected by laparoscopy in 4(4%) cases. This is in accordance with study conducted by Hamid R et al<sup>6</sup> (1994) reported incidence of tubal blockage and endometriosis in 15% and 9% respectively. Our study is in accordance with the Speroff et al<sup>7</sup> (2005) who described that HSG images the uterine cavity and reveals the internal architecture of tubal lumen: neither of which can be evaluated by laparoscopy. Laparoscopy provides detailed information about the pelvic anatomy. HSG can not show adhesions, endometriosis and ovarian pathology. In our study, hysteroscopy detected intrauterine abnormalities in 47% cases. Our results were comparable to those of Prevedourakis et al<sup>8</sup>, (1994) who found that intrauterine adhesions was the most common abnormality seen on hysteroscopy in patients of infertility. According to table 6 in this study of 100 patients, intrauterine adhesions were found in 17(17%) cases on hysteroscopy and only 1 case was detected on HSG. Submucous myoma and polyp were detected in 3(3%) and 1(1%) cases during hysteroscopy and 1(1%) and no cases during HSG respectively. Atrophic endometrium and endometritis was detected in 7(7%) cases and 5(5%) cases respectively; on hysteroscopy. But no such case was reported on HSG. Septate and hypoplastic uterus was found in 2 (2%) and 2(2%) cases respectively on hysteroscopy and 1(1%) and 2(2%) cases on HSG. One case of Bicornuate uterus was found on HSG but no case was detected on hysteroscopy. Fibrosed ostia were found in 9(9%) cases on hysteroscopy and In 36(36%) cases bilateral blocked tubes were

found on HSG. In this comparison hysteroscopy shows condition of uterine end of fallopian tube only, while in cases of tubal blockage reported during HSG block may be situated at any site in the tube. Hysteroscopy diagnosed uterine synechiae, endometritis, small polyp and some mucous myoma which HSG was not able to detect. In our study agreement of two procedure in 61 (61%) cases and disagreement in 29(29%). This is in accordance with Wang CW<sup>9</sup>(1996) whose findings were similar in 65% cases and dissimilar in 35% cases from both methods. Malhotra N and Sood M<sup>10</sup>(1997) stated HSG corresponds with hysteroscopy in 56.2%. In our study it is 61%.

### Conclusion

Premenstrual endometrial biopsy invasive, costly but effective test of endometrial bed pathology especially for ovulation detection when properly timed. It also catch any pathology in its inception, endometritis, luteal phase defect, adenomatous hyperplasia. Endometrial biopsy should be recommended as outpatient screening test in the evaluation of infertile couple.

Postmenstrual Hysterosalpingography is more useful in determining endosalpingeal pathology with exact site of tubal block. It is also useful in diagnosing uterine and pelvic pathology.

Hysteroscopy is very useful tool for diagnosis of intrauterine pathology and also a convenient procedure when done with laparoscopy in same sitting i.e. (laparohysteroscopy). It can detect intrauterine pathology like intrauterine synechiae, uterine septum, fibroid and polyp which may remain undetected on prior investigations like ultrasonography, HSG and laparoscopy.

As all of these procedures have some specific significance, no procedure is substitute for other and they should be considered complementary to each other, as for endometrial bed pathology – endometrial biopsy is the best among all discussed options but hysteroscopy can also help.

### For ovulation detection

Endometrial biopsy is best when properly timed but USG is preferred now a days.

### For tubal patency

HSG and laparoscopic chromopertubation are useful. Laparoscopy is gold standard but as it is an invasive and expensive procedure, HSG is used as initial investigation for detection of tubal patency and laparoscopic chromopertubation done for confirmation of block.

**Conflict of Interest: Nil**

**Source of support: Nil**

### For pelvic pathology

Laparoscopy is best among all these. It can detect pelvic pathology directly like- ovarian cyst, tuboovarian mass, findings suggestive of tuberculosis and especially endometriosis and pelvic adhesion which may remain undetected during HSG and sometimes even on ultrasonography.

### For Pathology of uterine cavity

Hysteroscopy is best. it can detect intrauterine pathologies, like submucous myoma, polyp, IUCD and especially intrauterine synechiae which usually remains undected with previous procedures. Laparoscopy and hysteroscopy having added advantage, that minor surgical procedure can be done during diagnostic procedure whenever pathologies encountered and operative facilities are available. Laparoscopy and hysteroscopy can be omitted with normal HSG and USG but definitely indicated when HSG and USG findings are positive or in cases of unexplained infertility.

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