



## Comparison of Laparoscopy and Hysterosalpingography in Diagnosis of Tubal Occlusion

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### ABSTRACT

**BACKGROUND:** *Infertility has always been one of the most elusive symptom complexes that perplex the best gynecologists.*

**OBJECTIVES:** *To compare hysterosalpingography and laparoscopy in the diagnosis of tubal occlusion in infertile patients.*

**METHODS:** *30 Patients of infertility were evaluated prospectively in the Department Of Gynaecology and Obstetrics in Government Lalla Ded Hospital, Srinagar from April 2014 to October 2014. The findings of HSG and laparoscopy were compared.*

**RESULTS:** *The sensitivity of HSG was 90.91% and specificity was 77.78 % with positive predictive value of 83.33% and negative predictive value of 87.50%, when tubal pathology was defined as any form of tubal occlusion detected at laparoscopy, either one sided or two sided.*

**CONCLUSION:** *HSG demonstrates high sensitivity in our study. So it should be used as the initial investigation for identifying tubal patency. As the specificity is less, we suggest that laparoscopy is necessary to recognize those cases of tubal block which were unrecognized or wrongly recognized on HSG. In addition, the patients who were found to have tubal block on HSG, laparoscopy helps in finding the cause of infertility like existence of peritubal adhesions and endometriosis that can guide appropriate therapy.*

**KEYWORDS:** *Laparoscopy, Hysterosalpingography, Infertility*

### INTRODUCTION

Infertility is one of the most common disorders confronting gynecologists and is defined as the inability to conceive after one year of regular unprotected intercourse.<sup>1,2</sup> Infertility affects about 10-15% of Reproductive age couples. Tubal pathology is one of the main causes of infertility. It accounts for 25-35% of the cases of infertility.<sup>1</sup> In routine workup of infertility patients the ability of the current tests to evaluate tubal

function is limited. But tubal damage can be assessed by tubal patency and the extent of peritubal adhesions<sup>3</sup>. HSG is widely used as first line approach to assess the patency of fallopian tubes and uterine anomalies in the routine infertility workup<sup>4</sup>. However, despite tubal patency being demonstrated by HSG, laparoscopy has been suggested as a mandatory step to rule out peritubal adhesions and endometriosis<sup>5</sup>. Though, HSG and laparoscopy, both are invasive

techniques, HSG is much less invasive than laparoscopy. Further, HSG being relatively inexpensive, simple and rapid diagnostic test it continues to be the first line approach in assessing the tubal patency. Laparoscopy and dye insufflation is recommended by Royal College of Obstetricians and Gynecologists as the tubal patency investigation of choice for infertility<sup>6</sup>. The Laparoscope is a valuable clinical tool that has changed the practice of gynecology. It can confirm a clinical impression, establish a definite diagnosis, follow the course of disease and modify therapy.

### MATERIAL AND METHODS

30 Patients of infertility were evaluated prospectively in the Department Of Gynaecology and Obstetrics in Government Lalla Ded Hospital, Srinagar from April 2014 to October 2014. The findings of HSG and laparoscopy were compared. HSG was performed prior to ovulation between menstrual cycle days 7 and 12 to avoid potential pregnancy and to take advantage of thinner proliferative phase endometrium. With Patient in dorsal lithotomy position, balloon catheter is inserted through the cervix and past the internal cervical os. Contrast dye (radiopaque material) was dissolved in 10-20 cc of water, and was injected into the uterine cavity. An X-ray examination was performed twice: first in the filling phase of uterine cavity by contrast material and second in the spreading period of the abdomen.

Laparoscopy was done under general anesthesia at least 3 months after HSG. After preoperative evaluation and preparation of the patient, laparoscopy was performed in the premenstrual phase. The patient was put in the supine position under effect of general anesthesia, cleaning and sterilization of abdomen up to mid thigh and vagina was done. Sims speculum was introduced into the vagina so that cervix could be visualized clearly. Meanwhile a small incision about 1 cm was made above the umbilicus through which camera was passed into the abdominal cavity.

Another probe called Morilands probe was passed through incision in right or left iliac fossa or both according to need for handling. Meanwhile catheter is passed through cervix through which methylene blue dye is forced into the uterine cavity to the fallopian tubes in order to see for patency of fallopian tubes, which is seen as spill of dye into the peritoneal cavity, and visualized by the camera.

### ETHICAL APPROVAL

Our present study did not need any ethical clearance as it was a simple OPD minimally invasive procedure performed for patients benefit. All the participants in the study were included only after written informed consent from them even if it was a simple minimally invasive procedure.

### RESULTS

All the patients in the study group were complaining of infertility. Of the 30 patients of infertility, 20 were in primary infertility group and 10 were in secondary infertility group. The age of patients was between 21 and 39 years. The average duration of primary infertility was 4.08 years and secondary infertility was 5.15 years. The sensitivity of HSG was 90.91% (95%CI: 76.43-96.86) and specificity was 77.78 % (95%CI 59.24-89.39) with positive predictive value of 83.33% (95%CI 68.11-92.13) and negative predictive value of 87.50% (95%CI 69.0- 95.66), when tubal pathology was defined as any form of tubal occlusion detected at laparoscopy, either one sided or two sided.

Table 1 and 2 show comparison of tubal status between HSG and laparoscopy.

**Table 1:**

HSG	LAPAROSCOPY		TOTAL
	Abnormal	NORMAL	
Abnormal	15	3	18
Normal	2	10	12
Total	17	13	30

**Table 2:**

Laparoscopy HSG	Normal	U/L tubal block	B/L tubal block	Total
Normal	10	2	0	12
U/L tubal block	-	4	1	5
B/L tubal block	3	1	9	13
Total	13	7	10	30

**Table 3** Correlation of laparoscopic findings with tubal patency

Laparoscopy findings	Blocked tubes	Patent tubes
Adnexal adhesions	7	1
Endometriosis	4	2
Suspected intratubal block	5	-

Periadnexal adhesions were found in 45.45% of the blocked tubes on laparoscopy. Endometriosis was detected in 25% of the blocked tubes and suspected intratubal block in 30.30%

## DISCUSSION

Infertility is a painful condition which affects about 8-12% of the couples in the reproductive age group worldwide<sup>7</sup>. Of the etiologies of infertility, tubal factor is one of the most common causes (25-35%)<sup>8</sup>. In the present study we

compare HSG and laparoscopy in the diagnosis of tubal factor infertility. HSG is the initial investigation to assess the patency of fallopian tubes. It is less invasive, more cost effective with less complication rate as compared to laparoscopy. The disadvantages of laparoscopy are possibilities of allergic reactions to iodine, pelvic infections, endometriosis, tubal rupture (due to contrast material given under pressure in patients with hydrosalpinx) and radiation exposure. Laparoscopy being a more invasive

technique than HSG is considered as a gold standard in diagnosing tubal pathology and peritoneal factors in infertility. The % of cases of unexplained infertility and wrongly interpreted causes of tubal factor infertility would be much less if, laparoscopy was routinely included in the evaluation of infertility, since it can diagnose conditions that might otherwise go unrecognized such as endometriosis, TB, PID and tubal factor (Wrongly recognized or unrecognized on HSG)<sup>9</sup>. In our study, we consider diagnostic laparoscopy as the reference standard in detecting tubal blockage. We compared HSG findings of tubal patency with laparoscopic chromotubation and found a sensitivity of 90.91% (95%CI :76.43-96.86) and specificity was 77.78%(95%CI 59.24-89.39) which were comparable with study from Gokhan Goynumer et al which showed sensitivity and specificity of 80% and 75% respectively when tubal block was defined as any form be it unilateral or bilateral.<sup>10</sup> The positive and negative predictive values were 83.33% (95%CI 68.11-92.13) and 87.50% (95%CI 69.0- 95.66) respectively. The false positive and false negative rates were 10% and 5% respectively.

Of the 13 patients shown to have bilaterally occluded tubes on HSG only 9(69.23%) had bilaterally occluded tubes on laparoscopy. In other studies laparoscopy has been shown to reveal abnormal findings in 21-68% of women with abnormal HSG.<sup>11, 12, 13</sup> On laparoscopy, adnexal adhesions were noted in 7, endometriosis in 4 and suspected intratubal block in 5 patients. The superiority of laparoscopy over HSG in assessing extratubal pathology has been shown in our study as has been demonstrated in other studies.<sup>14, 15</sup>

## CONCLUSION

HSG demonstrates high sensitivity in our study. So it should be used as the initial investigation for identifying tubal patency. As the specificity is less, we suggest that laparoscopy is necessary to recognize those cases of tubal block which were unrecognized or wrongly recognized on HSG. In addition, the patients who were found to have

tubal block on HSG, laparoscopy helps in finding the cause of infertility like existence of peritubal adhesions and endometriosis that can guide appropriate therapy.

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## DECLARATION OF INTERESTS

There is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

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