# A COMPARATIVE STUDY OF HYSTEROSALPINGOGRAPHY AND LAPAROSCOPY IN THE INVESTIGATION OF INFERTILITY

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## SUMMARY

A comparison of Hysterosalpingography (HSG) with Laparoscopy in the evaluation of tubal factor in 105 infertile women is presented. Results of these tests showed agreement for tubal patency in 65.7% of the cases. Both procedures are discussed with their limitations.

**Key Words: Hysterosalpingography (HSG), Laparoscopy, Chromopertubation.**

## INTRODUCTION

Tubal factors are believed to be responsible for 35%- 50% infertile marriages[1,2,3], hence, evaluation of tubal patency is of obvious importance in the investigation of female infertility. Hysterosalpingography (HSG) gives information about the uterine cavity, the interior and patency of the fallopian tubes, while laparoscopy on the other hand is employed for direct visualisation of the adnexae and conditions outside the tubes and uterus. Agreement between the results of HSG and Laparoscopy has been reported to be between 46% and 82%[1-3].

## MATERIALS AND METHODS

From 1990-1992, 105 patients were investigated with both HSG and Laparoscopy. Thirty-two (32) had primary infertility and 73 secondary infertility. Those with primary infertility ranged from 19 to 39 years of age and those with secondary infertility from 20 to 43 years; an overall average age of 25.7 years.

The HSG examinations were generally performed just before calculated ovulation as an outpatient with no pre-medication. A Rubin cannula inserted into the cervical canal was used for the introduction of 8-10ml. of water soluble contrast Urografin 76% and antero-posterior films were taken. Additional films were taken when indicated.

The laparoscopy was combined with chromopertubation, where a Rubin cannula was inserted into the endocervical canal and methylene blue in saline was injected through the cannula to test tubal patency. All laparoscopies were performed under general anaesthesia after the HSG and also during the second half of the menstrual cycle.

The statistical analysis was carried out with Chi-square test.

## RESULTS

The results obtained by HSG and Laparoscopy are compared in Tables 1-IV. There were 105 patients involved in the study.

Tables I and II compare the right and left tubal patency respectively at HSG and laparoscopy. Chi-square test gave a value of 4.01, $P< 0.05$ on the right side and 8.1 $P< 0.005$ on the left side respectively which indicates significant differences between the two methods for determining tubal patency. Table II compares bilateral tubal patency with both methods which agreed on 69 patients (65.7%). Table IV compares the final diagnosis of tubal patency by laparoscopy and HSG in the 105 patients.

**Table 1: Comparison of Right Tubal Patency at HSG and Laparoscopy**

| | HSG | | |
|---|---|---|---|
| Laparoscopy | Opened | Closed | Total |
| Opened | 80 | 6 | 86 |
| Closed | 0 | 19 | 19 |
| Total | 80 | 25 | 105 |

$\chi 2 = 4.01$ $P < 0.05$

**Table II: Comparison of Left Tubal Patency at HSG and Laparoscopy**

| | HSG | | |
|---|---|---|---|
| Laparoscopy | Opened | Closed | Total |
| Opened | 76 | 10 | 86 |
| Closed | 0 | 19 | 19 |
| Total | 76 | 29 | 105 |

$\chi 2 = 8.1$ $P < 0.005$

A summary of the findings noted at one and not at the other procedure is presented in Table V. Since comparison of both procedures cannot be limited merely to the tubal factor, other relevant findings have been included.

## DISCUSSION

A number of authors have found a positive correlation between HSG and Laparoscopy, reported variously between 46%-82%[5,6,7]. Our study was 65.7%. It is obvious on review of the data that both procedures involve a certain amount of experience with

**Table III: Comparison of Bilateral Tubal Patency at HSG and Laparoscopy**

| | Bilateral HSG | | | | |
|---|---|---|---|---|---|
| Bilateral Laparoscopy | a | b | c | d | Total |
| a | 69 | 1 | 1 | 5 | 76 |
| b | 0 | 1 | 1 | 4 | 10 |
| c | 0 | 0 | 10 | 0 | 10 |
| d | 0 | 0 | 0 | 9 | 9 |
| Total | 69 | 7 | 11 | 18 | 105 |

*a = All tubes opened*
*b = Left tube opened, right tube closed*
*c = Right tube opened, left tube closed*
*d = All tubes closed*

**Table IV: Comparison of Diagnosis of Tubal Patency by Laparoscopy and HSG (105 Patients)**

| | Laparoscopy | | HSG | |
|---|---|---|---|---|
| Diagnosis | No of Patients | % | No. of Patients | % |
| Bilateral Tubal Patency | 76 | 72.4 | 69 | 65.7 |
| Unilateral Tubal Patency | 20 | 19.0 | 18 | 17.15 |
| Bilateral Tubal Occlusion | 9 | 8.6 | 18 | 17.15 |

**Table V: Findings as Detected at One Examination (HSG or Laparoscopy)**

| Examination | Ovary | Uterine Tube | Uterus | Peritoneum | Total |
|---|---|---|---|---|---|
| Laparoscopy | Cyst — 3<br>Stein-Leventhel — 1 | Peritubal Adhesions — 5 | Myoma (Extra Mural) —4 | Pelvic Endometrosis — 3 | 16 |
| HSG | Nil | Hydrosapinx — 5 | Polyp — 1<br>Synechia — 6<br>Myoma (Intramural) — 3 | Nil | 15 |

them. Both provide information which must be carefully interpreted to make a fair evaluation of tubal dysfunction. This was felt even more true for HSG which has been shown to have its pitfall both in technique and interpretation.

Maathius *et al*[1] speculate about the possible reasons for such discrepancies on functional and technical factors and also by differences in the properties of the liquid used in HSG and chromopertubation. No or impaired passage at HSG does not always indicate that the tube is blocked. It may depend upon spasm of the tube, probably eliminated by general anaesthesia used at Laparoscopy. The dye solution for chromopertubation is less viscous than the contrast medium for HSG and should more easily pass a partially occluded tube. Easy passage of contrast medium through one tube result in complete filling of the other. Contrast medium passing one tube may flow to the other side of the pelvis and it may then be impossible to find out from which tube it has emerged particularly where non-fluoroscopy technique is used.

HSG is safe, readily available, at a low risk with no general anaesthesia and occasional therapeutic effect resulting in pregnancy. Laparoscopy on the other hand, is not readily available and requires an experience of the laparoscopist and general anaesthesia. The death rate from diagnostic laparoscopy has been estimated to be about 8 per 100,000 however, its therapeutic effect resulting in pregnancy is not very different from HSG[6].

It is generally believed that findings at laparoscopy are usually easier to interpret and more conclusive than those obtained by HSG. This could account for the significant differences in the method in determining tubal patency. The other factor accounting for this significant difference in our study could be attributed to our non-fluoroscopy technique of HSG. It is noteworthy, however, that both tests also provided valuable data on other factors affecting fertility (Table V). It is obvious that those differences observed derived mainly from the fact that Laparoscopy exhibits surfaces and HSG the lumens of the pelvic organs[2]. Therefore, neither procedure can be supplanted by the other especially if there is a possibility of corrective surgery, both procedures should be used to obtain a reliable picture of the practicability and prognosis before any operation in planned. It is therefore concluded that the two methods are complementary in the investigation of female infertility.

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