

**AN EVALUATION OF THE ACCURACY OF TUBAL PATENCY  
BY AIR INSUFFLATION, HYSTEOSALPINGOGRAPHY AND  
LAPAROSCOPIC CHROMOPERTUBATION**

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**SUMMARY**

A comparative study of Rubin's air insufflation, hysterosalpingography (H.S.G.) and laparoscopic chromopertubation was done to evaluate the accuracy of tubal patency from July 1980 to November, 1981. A 100 cases were investigated, from our sterility clinic. There was a selection towards patients, who had blocked tubes by air insufflation. In all the 100 cases air insufflation, H.S.G. and laparoscopy were done. The series included 68 cases of primary sterility and 32 cases of secondary sterility. The incidence of blocked tubes by air insufflation, H.S.G. and laparoscopy were 67.65%, 41.18% and 29.42% respectively in the primary sterility cases. The percentage of blocked tubes for the secondary sterility cases done by the 3 methods were 81.25%, 68.75% and 75% respectively. In the 50 cases of blocked tubes, the sites of tubal obstruction as made out by H.S.G. were cornual occlusion in 24, mid portion occlusion in 6 and fimbrial occlusion in 20. The present study showed complete agreement in 70% of cases. Associated pelvic pathology diagnosed at laparoscopy were pelvic adhesions, polycystic ovarian disease, endometriosis and fibroid. At H.S.G. 5 cases of congenital anomalies of the uterus were made out. The present study showed that laparoscopy was more accurate more informative and more conclusive, when compared to air insufflation and H.S.G.

*Introduction*

Comparative studies to diagnose the accuracy of Rubin's air insufflation, H.S.G. and laparoscopy in infertile pati-

ents, has been the subject of several reports in recent years. Frangenheim (1968) advocated abolishing air insufflation and H.S.G. altogether in favour of laparoscopy. On the other hand, Kierse *et al* claimed that H.S.G. may be more reliable than laparoscopy. Because of this controversy in current literature we

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were encouraged to undertake this comparative study.

### Aim of Study

The aim of the present study was to compare the diagnostic accuracy of Rubin's air insufflation, H.S.G. and laparoscopy regarding tubal patency.

### Material and Methods

One hundred cases were chosen from the Sterility Clinic of the Government RSRM Lying-in Hospital, Madras, South India. The present study began in July, 1980 and continued until November, 1981. The series included 68 (68%) cases of primary infertility and 32 (32%) cases of secondary infertility.

While choosing the cases in this series, there was a selection towards patients who had blocked tubes by Rubin's air insufflation method.

After performing the other routine investigations for infertility, these patients were subjected to a H.S.G. using Conray 420, and later to a laparoscopic chromopertubation. Patients submitted for laparoscopy had I.V. lytic cocktail using

75 mg. pethidine, 25 mg. largactil and 12.5 mg of phenergan, supplemented with local anaesthesia. Direct trocar placement of Dingfelder was used. Methylene blue was injected through a cervical cannula.

### Results

After performing tube testing by the air insufflation method, 46 cases of blocked tubes and 22 cases of patent tubes were chosen from the primary sterility group. In the secondary sterility group we chose 26 cases of blocked tubes and 6 cases of patent tubes. (Table I).

All the 100 cases were next subjected to a H.S.G. followed by laparoscopic chromopertubation.

The results of H.S.G. in 68 cases of primary sterility showed that in 28 cases the tubes were blocked, giving an incidence of 41.18% of blocked tubes. In the secondary sterility, 22 cases had blocked tubes giving an incidence of 68.75% of blocked tubes.

With laparoscopic chromopertubation only 20 cases out of the 68 cases of primary infertility had blocked tubes, giving an incidence of 29.2%. In the secondary sterility cases 22 out of the 32 patients had

TABLE I  
Results of Tube Testing by Air Insufflation

Group	Total No. of cases	Patent tubes	%	Blocked tubes	%
Primary	68	22	32.35	46	67.65
Secondary	32	6	18.7	26	81.25

TABLE II  
Results of Tube Testing By H.S.G.

Group	Total No. of cases	Patent tubes	%	Blocked tube	%
Primary	68	40	58.82	28	41.18
Secondary	32	10	31.25	22	68.75

TABLE III  
Results of Tube Testing With Laparoscopy

Group	Total No. of cases	Patent tubes	%	Blocked tubes	%
Primary	68	48	70.58	20	29.42
Secondary	32	10	25	22	75

TABLE IV  
Accuracy with the 3 Methods of Tubal Patency Tests

Method	Total No. of cases	Patent tubes	%	Blocked tubes	%
Air Insufflation	100	28	28	72	72
H.S.G.	100	50	50	50	50
Laparoscopy	100	58	58	42	42

blocked tubes, giving an incidence of 75%.

While comparing the 3 methods, it was seen that regarding tubal patency, there was agreement in 28% of cases. Regarding tubal block, there was agreement in 42% of cases. Hence there was, on the whole, agreement in 70% of cases.

TABLE V  
Associated Pelvic Pathology at Laparoscopy

Pelvic adhesions	7
Pelvic endometriosis	1
Polycystic ovaries	24
Ovarian cyst	1
Hydrosalpinx	2
Fimbrial phimosis	2
Subserous fibroid	1

TABLE VI  
Pelvic Pathology Diagnosed or Suspected at H.S.G.

Arcuate uterus	2
Bicornuate uterus	1
Hydrosalpinx	4
Intravasation	3
Adhesions (Suspected)	4
Ovarian mass (Suspected)	2
Tuberculous endometritis (Suspected)	1

### Discussion

The present study showed complete agreement in 70% of cases. A review of the literature showed that in Marik (1979) series, there was agreement in all the 3 tests in 59% of patients.

In our series, there was agreement between H.S.G. and laparoscopy in 84% of cases. In El-Minawi (1978) series the agreement between laparoscopy and H.S.G. was 57.67%. In Kerise and Vandervellein (1983) series 76%, and in Sheth and Krishna (1979) series there was agreement in 74% of cases.

The gross discrepancy between Rubin's air insufflation and the other two methods may be due to (1) leakage of air, (2) rapid insufflation of air may cause spasm at the utero-tubal junction, (3) sharp fixation of the uterus may give rise to angulation at the internal os, (4) there may be spasm at the level of the internal os, and (5) it may be due to a blocked cannula.

The discrepancies between H.S.G. and laparoscopy may be due to (1) improper technic in performing the H.S.G., (2) injection of insufficient contrast media, (3)

too rapid injection of contrast media, (4) low viscosity of methylene blue when compared to conray 420, (5) tubal spasm, (6) H.S.G. may have broken down the delicate fimbrial adhesions.

The small discrepancy between the laparoscopic finding and H.S.G. may be due to the leakage of dye into the vagina and subsequent loss of sufficient media used or inaccurate diagnosis of tubal patency by H.S.G., especially in the presence of fimbrial phimosis.

The additional advantages of laparoscopy is the discovery of underlying pelvic pathology like adhesions. It discloses the site of adhesions, whether periovarian or peritubal and shows the relationship between the fimbria and the ovary. Laparoscopy is particularly useful in the diagnosis of endometriosis and provides a higher index of suspicion for genital tuberculosis. Ovarian pathology can also be detected. In our series, there were 24 cases of PCO, in El-Minawi's there were 16 cases of PCO. But H.S.G. still has a place in sterility investigations as it is superior to laparoscopy in the

diagnosis of intra uterine and endometrial lesions. In our series we had 8 cases of congenital anomalies of the uterus.

In conclusion, H.S.G. and laparoscopy should not be looked on as alternatives, but rather as complementary diagnostic procedures in infertility.

These two procedures are by far superior to the conventional Rubin's insufflation. From our results, we agree with Frangenheim that the time has come when one should abandon Rubin's insufflation for these two procedures which have a much higher percentage of accuracy.

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