

A CRITICAL STUDY OF THE THERAPEUTIC ROLE OF HYSTEOSALPINGOGRAPHY

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Hysterosalpingography (HSG), inspite of its pitfalls both in technic and interpretation, is the widely practised method of evaluation of tubal function in infertility. It is credited as the least imposing procedure which gives valuable information about the fallopian tubes at a low risk (Siegler, 1967). However, since the advent of the endoscopic technics, and because of the limitations of HSG, laparoscopy has become a more popular method of evaluating the female pelvic organs in general, and the tubal function in particular (Steptoe, 1967; Coltart, 1970; Wheelless, 1976; Motashaw, 1977; Rao, 1977; Varma and Murphy, 1978). But the recent reports on comparison between HSG and laparoscopy (Kairse and Vandervellen, 1973; Gabos, 1976) suggest that both procedures involve a certain amount of experience to interpret, and provide only the crudest possible information regarding the functional capacity of the fallopian tubes. Considering the relatively good correlation with endoscopic findings (Moghissi and Sim, 1975), less incidence of serious complications and greater convenience to the patient, HSG is still the procedure of choice in the

initial, basic evaluation of the infertile woman, which should be supplemented with endoscopy wherever required (Gabos, 1976).

While the invaluable aid of hysterosalpingography in evaluating tubal function in infertile women is well recognised, its therapeutic effect is still a subject of some controversy. Whitelaw *et al* (1970) found no increase in the pregnancy rate following HSG. On the other hand, Palmer (1960) reported three times greater incidence of pregnancy within one year of HSG procedure. Gillepsie (1965) reported a conception rate of 41.30% within one year of HSG with oil media, and Mackey *et al* (1971) reported a pregnancy rate of 40.00% with water soluble dye.

We, in our institution, consider HSG as a basic investigational procedure and prefer to perform this investigation as a routine in all women who register for infertility work-up. While the purpose is essentially to diagnose any tubal or uterine factors, we encountered some women, with no detectable pelvic abnormalities, conceiving following the HSG procedure. Interested in this observation and also aware of the prooble therapeutic role documented in the literature, we made a comparative analysis to find out whether the resulting pregnancies were really due to the therapeutic effect of

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HSG. The comparison was with an identical group of women who were investigated for infertility with the preliminary investigations alone (endometrial biopsy, tubal insufflation test and post-coital test), and not with an HSG. Our views on this controversial subject, substantiated with the results of the comparative study, is discussed in this communication.

Material and Methods

Beginning in April 1977, over a period of one year, 220 women with infertility problems were subjected to hysterosalpingographic evaluation. All these women had an endometrial study, tubal insufflation test and post-coital test done before undergoing the HSG procedure. We shall refer to this group of patients as the 'HSG group'. Almost at the same period, another parallel study was initiated in 192 infertile women who were investigated with an endometrial biopsy, tubal insufflation test and post-coital test alone, but not with an HSG. This group will be referred to as the 'non-HSG' group. All those women, belonging to both the HSG group and the non-HSG group, who had a normal PCT and had no pelvic pathology detected were advised to wait optimistically for a few months before undergoing any elaborate investigational procedures or treatment. These were the type of patients who were selected for the present study, and were followed-up for

a period of 6 to 8 months. For purpose of comparison, patients belonging to either group were matched for all the parameters, such as age duration of sterility and duration of follow-up.

As a separate group, another 16 women who opted for artificial insemination with donor semen for reasons of refractory male factors were also considered for this study. AID was performed in these women only after a complete female evaluation with all the basic investigations including HSG.

We have employed water soluble contrast medium in all our patients. The technic of HSG procedure described by Rozin (1965) was followed routinely, and was described in detail in our previous communication related to the hysterosalpingographic evaluation of women who had repeated unsuccessful attempts at AID (Rajan *et al*, 1979).

Observations

Among the 220 women in the HSG group, 136 women were proved to have no impediment for fertility. Similarly, in the non-HSG group, of the 192 women 141 were found to be normal for all the parameters investigated. Seventy five patients in the former group and 105 patients in the latter group had regular follow up for at least 6 to 8 months (Table I). During this period of follow-up, 30 patients in the HSG group con-

TABLE I
Method of Investigation

Particulars	Preliminary clinical investigations alone (non-HSG group)	Preliminary clinical investigations & HSG (HSG group)
Total No. of patients	192	220
Patients with no abnormality	141	136
Patients with no abnormality who had 6 to 8 months follow-up	105	75

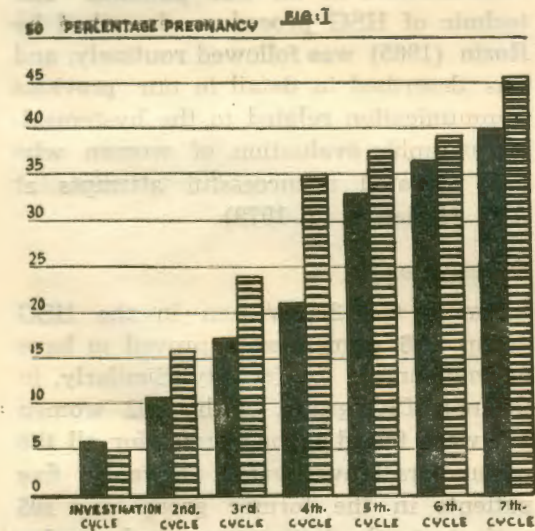
ceived without any form of treatment; and in the non-HSG group 48 patients had conceived (Table II). The percentage of

success rate of 62.50 per cent. All those became pregnant did so within 1 to 4 cycles of exposure with a mean of 1.80

TABLE II
Incidence of Pregnancy

Particulars	Non-HSG group	HSG Group
Total No. of normal patients followed-up for 6 to 8 months	105	75
No. of patients who conceived	48	30
Percentage of pregnancy	45.71	40.00

pregnancy occurring in either group in each cycle following the investigations is charted in Fig. 1. Obviously there was no



statistical difference in the incidence of pregnancy in either groups, nor was there any difference among the two groups in

the occurrence of pregnancy in each cycle following the investigations. These observations amply proved that conceptions occurring in normal women following the investigations had no relevance to the performance of HSG.

However, of the 16 women who were subjected to artificial insemination with donor semen, after being proved to be normal by the basic investigations including HSG, 10 women conceived giving a cycles. Of the 135 women who were inseminated over a 3 year period, from April 1975 to March 1978, the best results were obtained in the 16 women who had a prior HSG evaluation (Table III and Fig. 2). In addition to the increased success rate, compared to the other schedules, the number of cycles of exposure were also less (Table IV). The improved results may be due to the strict evaluation of the female to include only the normal women for AID.

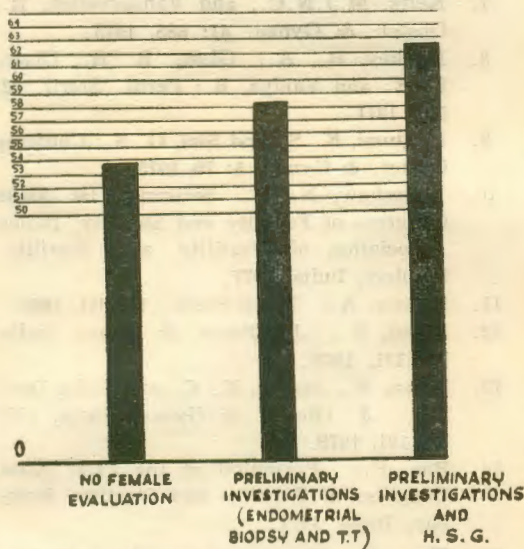
TABLE III
Results of A.I.D. Performed in 135 Women
(April 1975 to March 1978)

Particulars of A.I.D.	No female evaluation	Preliminary clinical tests alone	Preliminary clinical tests
Total patients	52	67	16
No. of patients conceived	28	34	10
Success rate (%)	53.80	58.20	62.50

TABLE IV
A.I.D. — Mean Cycles of Exposure

Insemination without prior female evaluation	Insemination after preliminary clinical evaluation	Insemination after preliminary clinical evaluation and HSG
2.50	2.00	1.80

FIG. II
PERCENTAGE PREGNANCY FOLLOWING A.I.D.



Discussion

Speculation concerning the precise mode of therapeutic action of hysterosalpingography has included the following mechanisms:

1. It may effect a mechanical lavage of the tubes dislodging mucus plugs.
2. It may straighten the tubes and thus break down peritubal adhesions.
3. It may exert a stimulatory effect on the cilia of the tubal mucosa.
4. It may improve cervical mucus.
5. The iodine may exert a bacteriostatic effect on the mucous membrane.

As per these mechanisms if HSG has to exert any therapeutic effect, the incidence of pregnancy occurring in normal

women following the HSG procedure should be more than the incidence of pregnancy occurring following the basic clinical investigations. In our study we divided the women, who were investigated and found to be normal, into two groups according to whether a HSG was done or was not done. Of the 75 women who had a HSG done and had regular follow-up, 30 had conceived within 6 to 8 months time, giving a pregnancy rate of 40.00 per cent. Whereas, among the 105 women who had no HSG done, 48 had conceived giving an incidence of 45.71 per cent. Moreover, when the incidence of pregnancy in each cycle following the investigations was compared, there was no statistical difference in either group. From this observation we feel that HSG has no special therapeutic effect, and if there is any treatment value for this type of investigation the same can be obtained by performing the basic investigations alone. However, since HSG provides more valuable informations there is no doubt that it should be included as one of the basic investigative procedures and all infertile women should be investigated with a HSG.

To improve the results of donor artificial insemination, a proper prior female evaluation has been advised by many investigators (Beck, 1974; Goss, 1975; Dixon and Buttram, 1976). By performing the basic clinical investigations such as the endometrial biopsy and tubal insufflation test prior to donor insemination we have observed improved results

(Rajan, 1978). It appears that when HSG also is performed better case selection is possible since proper diagnosis is possible. Among the 16 women who were investigated with a HSG and were found to be normal, 10 women conceived within 1 to 4 cycles of exposure. This gives a pregnancy rate of 62.50 per cent, which is more than the results reported for the series inseminated without a hysterosalpingographic evaluation.

Conclusion

By comparing two groups of infertile women who were matched for all the parameters, except that one group had a HSG done and the other group did not, we found that there was no difference in the incidence of pregnancy resulting following the investigations. Hence we conclude that HSG, a valuable diagnostic aid, had no therapeutic effect. The improved results observed in the AID series appear to be due to proper case selection with the help of HSG than the therapeutic effect of HSG.

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