

## HYSTEROSALPINGOGRAPHIC EVALUATION OF DONOR ARTIFICIAL INSEMINATION FAILURES

by

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Experience with Donor Artificial Insemination (AID) for couples having irreversible male factor, where prompt success is the goal, is quite often discouraging because of the generally documented lower pregnancy rate (Raboch and Tomasek, 1967; Dixon & Buttram, 1976; and Rajan, 1976). The most important causal factor instrumental to this is the inclusion of patients who are not thoroughly screened and hence having undiagnosed pelvic abnormalities known to compromise fertility. Whereas, a preliminary evaluation of the female with the basic investigations such as endometrial biopsy (evidencing ovulation) and tubal insufflation test (evidencing tubal patency) appears to ensure greater success (Rajan, 1977). About 30% of the patients, whose basic investigations suggest no abnormalities, still fail to conceive in spite of repeated attempts at AID. Such patients are preferably investigated further by a hysterosalpingography or endoscopy for evidence of correctible conditions, perhaps missed in the previous diagnostic procedures (Dixon and

Buttram, 1976). Practically all the patients who conceive following AID do so within the first 6 cycles of exposure, and hence it is futile to persist with the procedure in the failed cases without further evaluation of the female (Rajan, 1977).

During the period from March 1977 to October 1977 we conducted a study to further evaluate the patients who had repeated unsuccessful attempts at pregnancy following AID. Twenty-one women who were found to be normal by the basic investigations, but failed to conceive within 3 to 6 consecutive cycles of insemination, were subjected to hysterosalpingographic evaluation. Following the HSG, insemination was resumed in all the patients. Detailed account of the advantages of this method of evaluating the AID failures form the basis of this presentation.

### *Hysterosalpingography*

All the HSGs were performed after the cessation of menses but prior to the expected time of ovulation. It was done as an outdoor procedure with no premedication. The procedure was carried out under fluoroscopy with a water-soluble medium (Diaginol Viscous). After a plain X-Ray, a Rubin cannula was inserted into the cervical canal for the intro-

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duction of dye. After an initial injection of dye (usually 3 to 5 ml), one antero-posterior film was taken. This was followed by another exposure taken after injection of all of the dye (usually 7 to 10 ml). A post-evacuation film was taken 5 to 10 minutes after the completion of injection. If the condition warranted, further follow-up X-rays were taken at intervals. An HSG was considered normal when uterine cavity and both tubes were well-outlined by the free flow of dye and satisfactory bilateral tubal spillage (without localisation) was obtained.

#### *Insemination Procedure*

The indication for AID in all these 21 cases was irreversible male factor proved by seminal cytology and testicular histology. Fresh semen samples collected from young healthy medical students were used for this purpose. Insemination was done on alternate days (2 or sometimes 3 attempts) in the expected time of ovulation. Quite often BBT was employed to predict the approximate day of ovulation. Insemination technic was the placement of semen in the upper vagina to keep the cervical os immersed in the seminal pool, and it was done within 2 hours of collection.

Irrespective of the HSG findings, insemination was resumed in all the patients. Five patients in this group were inseminated in the same cycle in which the HSG was performed, and in the remaining patients insemination was performed from the next cycle onwards.

#### *Observations*

Twenty-one women were investigated for tubal dysfunction by a hysterosalpingogram. The results of hysterosalpingography are presented in Table I. The findings were normal in 14 of the 21 patients (67%) (Fig. 1). Seven patients

TABLE I

*Hysterosalpingographic Results in the 21 Cases of A.I.D. Failures*

Normal hysterosalpingogram	14
Abnormalities in the hysterosalpingogram:	
1. Bilateral fimbrial occlusion	1
2. Bilateral fimbrial occlusion with bicornuate uterus	1
3. Unilateral (Rt) cornual block	1
4. Peritubal adhesions with pocked spill	2
5. Bilateral occlusion (Rt cornual and Left fimbrial)	1
6. Uterine hypoplasia with probable tubal hypoplasia	1
	21

(33%) showed either tubal or uterine abnormalities which may be responsible for the refractoriness to AID. (Figs. 2 to 5).

Following the HSG procedure AID was resumed in all the 21 patients. In 5 patients AID was performed in the same cycle in which the HSG was done. Of the 7 patients with abnormal HSG findings none conceived even after 6 cycles of exposure. This observation confirmed the accuracy of the hysterosalpingographic diagnosis of tubal deformity. Among those 14 patients with normal HSG results, 6 patients managed to become pregnant within 1 to 5 cycles of exposure, with one conception occurring in HSG cycle itself.

The HSG findings and the post-HSG insemination results presented signify the detrimental role of tubal factors in influencing the success rate of AID (in 33% of cases) and demonstrate the possible therapeutic effectiveness of HSG (in 43% of cases) when the tubes and uterus were normal.

### Discussion

Since tubal factors are believed to be responsible for 35 to 50 per cent of infertile marriages (Greenhill, 1956 and Arronet *et al* 1961), evaluation of tubal function is of obvious importance in the successful performance of AID. In order to maximize the results, Beck (1974) has suggested to confirm the tubal patency by either hysterosalpingography or laparoscopy routinely in all patients undergoing AID. While such a complete work-up on each patient may not be feasible, at least those clinically normal women who fail to conceive within 3 and certainly 6 cycles of exposure should have their reproductive capability thoroughly investigated (Dixon and Buttram, 1976).

In our study, we have conducted a hysterosalpingographic evaluation of tubal function of those apparently normal women who had at least 3 to 6 unsuccessful attempts at AID. HSG was preferred because it is the least imposing procedure which gives valuable information about both the tubes and uterine cavity at a low risk (Seigler, 1967) and with some possible therapeutic effect (Gillespie, 1965 and Mackey *et al* 1971). Obviously, HSG has been able to unearth tubal dysfunction in 33 per cent of AID failures in whom the basic investigations have perhaps failed to reveal any abnormalities.

Nevertheless, HSG has been shown to have its pitfalls both in technique and interpretation (Sweeny, 1962) and it may provide only the crudest possible information regarding the functional capacity of the uterus and fallopian tubes. Diagnostic accuracy of HSG was at its best and most accurate when satisfactory bilateral spillage was present. The group with bilateral occlusion at any site of the tube showed the next highest correlation. Dis-

crepancy was most frequent with unilateral occlusion at different sites Parekh and Arronet (1972). According to Gabos (1976), a significantly accurate finding and diagnostic correlation can be obtained by HSG in 74 per cent of cases, but there is a disturbingly high incidence of false positive findings (20%).

Because of the reported high incidence of false positive results, the 7 patients with abnormal HSG findings were not immediately eliminated from the study. Instead, they were given a fair trial with AID for 6 more cycles. That none of them conceived is a significant observation, because it confirms the HSG diagnosis of the tubal pathology as the cause of failure. These patients may be benefited by undertaking AID after tubal corrective surgery (Goss, 1975).

Moreover, yet another significant observation in this study is the therapeutic effectiveness of HSG in the normal cases. Of the 14 with normal HSG results, 43 per cent had successful pregnancies within 1 to 5 cycles of exposure. We consider this observation as very significant because these same patients had repeated unsuccessful attempts at AID before the HSG evaluation. Over and above, the therapeutic role of HSG has been well documented in the literature. Mackey *et al* (1971) have reported, in a group of infertile women, 55% conception with oily medium and 40% conception with water soluble medium.

Since the therapeutic effectiveness of HSG is quite impressive and more number of pregnancies are recorded, we see no reason to delay attempts at AID until the next menstrual cycle. In the last 5 cases, in fact, we have performed insemination in the same cycle in which the HSG was done. One patient in this group conceived during the HSG cycle.

The rationale for this step is based on the report of Goldenberg *et al* (1976), which do not suggest any increase in the incidence of spontaneous abortion or congenital anomalies in pregnancies occurring in the HSG cycle.

After having discussed the subject of HSG evaluation of AID failures in detail, the authors speculate the possibility of further improvement in the results, if HSG is included as one of the basic investigative procedures and performed in all women prior to AID. Strict screening of patients to include only those with a normal radiographic finding along with the documented therapeutic effectiveness of HSG should ensure significant improvement in the results of AID. The feasibility of this comprehensive programme was examined by the authors and a trial has been initiated anticipating a favourable outcome.

#### Conclusion

It is observed that the apparently normal women (whose basic investigations reveal no abnormalities) exposed to repeated unsuccessful attempts at AID must be further evaluated for evidence of any undetected impediments for fertility. A hysterosalpingographic study of 21 such patients has established tubal dysfunction as a factor responsible for the failure in 33 per cent of cases. In addition to the diagnostic role, we are impressed by the therapeutic effectiveness of HSG in 43 per cent of the patients who had normal HSG findings. In view of the two dis-

tinct advantages, the scope of routine evaluation of all AID subjects by HSG is discussed.

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See Figs. on Art Paper VII-VIII