ULTRASOUND GUIDED FALLOPIAN INSEMINATION A PRELIMINARY STUDY

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SUMMARY

In patients of non tubal infertility, tubal transfer techniques have been shown to have a higher rate of pregnancy than intrauterine transfer procedures. Non operative fallopian tube canulation is a recent procedure and has been performed under ultrasound and tactile guidance. In this study Semen Intra Fallopian Transfer was performed in nineteen patients of infertility and washed sperms were placed at the isthmoampullary junction. The fallopian tubes were catheterized under ultrasound guidance with a set of coaxial catheters. A positive pregnancy test was reported in 6 patients which is a fecundity rate of 31.6%. The procedure was cost effective, simple and with minimal side effects.

INTRODUCTION

Fertilization of human oocyte by a spermatozoon and its early development takes place in the lumen of the fallopian tube. Theoretically, in cases of non tubal infertility, the tubal lumen offers a more physiological environment to a developing embryo than an in vitro environment. Transtubal procedures appear to have a higher rate of pregnancy than intrauterine procedures (Yovich et al, 1987).

A procudure for the cathetrization of the fallopian tubes from the vagina was described recently (Jansen 1987) and was performed under sedation. An extension of this technique is the transfer of prepared semen directly into the tubal lumen in patients of non tubal infertility. It was the aim of this study to investigate the efficacy

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of Semen Intra Fallopian Transfer (SIFT). The advantages of this procedure are that it does not require anesthesia, is cost effective and is technically simple.

MATERIALS AND METHODS

A total of 19 couples were recruited for the study of which 13 had unexplained infertility and 6 had male sub-fertility (sperm count <30 million/ml). The age of the patients ranged from 20-35 years. Sixteen patients had primary infertility and 3 had secondary. In each case, a hysterosalpingography showed a normal interstitial and isthmic tubal anatomy. Diagnostic laparoscopy done in all cases confirmed normal external tubal anatomy and patent tubes.

Ovarian hyperstimulation was achieved with 50-100 mg clomiphene citrate (Siphene-Serono) from day 3 till day 7. In 6 patients injections of human menopausal gonadotropin (Pergonal-Serono) were given and 2 patients received pure FSH (Metrodin - Serono) supplementation. Monitoring was done by sonography, basal body temperature and cervical mucus study. At follicle maturation, ovulation was triggered by hCG injection (5000-10,000 IU, Profasi-Serono).

Semen was prepared by using the swim up technique (Howard Jones). SIFT was timed 24 hours after the hCG injection. It was done in the preovulatory phase in 12 patients and in the post ovulatory phase in the rest. The couples were asked to abstain during the cycle.

A modification of the original Jansen Anderson catheter was used. It consisted of (1) a soft 18G epidural catheter with an outer diameter of 3 F (0.8 mm) and an inner diameter of 0.5 mm (2) a firm but flexible opaque Teflon 5.5 mm outer cannula with a lateral curve and (3) a malleable metal obturator.

The procedure was done without sedation. At the outset, a three dimensional position of the uterus was defined by transabdominal US scanning (Fig. 1). The

Fig. 1 : Ultrasonographic picture of the uterus and adnexa.

outer cannula with the obturator was passed through the cervix into the uterus till firm resistance was met with US confirmed the position of the cannula at the uterotubal junction (Fig. 2). The obturator was

Fig. 2 : Outer cannula with its tip (⟵) at the fundus of the uterus.

Fig. 3 : Catheter tip (←) entering the right uterotubal junction.

withdrawn and the soft 18 G epidural catheter was threaded through the cannula. As it went past the uterotubal junction, the patients and the operator had a sensation of passage and a majority of patients complained of a mild lateral pelvic pain on the side where the catheterization was done. A volume of 30uL of the prepared semen containing 50,000-70,000 motile sperms was transferred into the tubal lumen on the side of the optimal response (Fig. 3). Patients were made to rest for half an hour after the procedure. Serum hCG was tested on day 28 and if positive a sonography was done at 6 weeks of gestation to confirm the viability and the intrauterine location.

RESULTS

Satisfactory catheterization was accomplished in all the 19 patients as judged by the sensation of passage and confirmed by sonography (Table 1). Fifteen patients had been subjected to SIFT in only 1 cycle and 4 in 2 cycles. Six out of 19 patients reported a positive pregnancy test (serum hCG > 50 miu/ml) on day 28 which is a pregnancy rate of 31.6%. The clinical summary of the patients who conceived is illustrated in Table II. All the pregnancies were intrauterine and viable at 6 weeks on sonography. There were no multiple pregnancies. Three of these 6 patients aborted before 12 weeks of gestation and the rest went to term and delivered healthy babies.

In 4 of the 6 conceptional cycles, the dominant follicle was still present at the time of SIFT. Twelve patients experienced lateral pelvic pain at the time of catheterization. Side effects of SIFT were seen in 10.5% of the patients in the form of cramping

Table I
ULTRASOUND GUIDED TUBAL CATHETERIZATION

S. No.	Criteria for successful catheterization	No. of patients n = 19
1.	Sensation of passage	19 (100%)
2.	Air bubble movement	19 (100%)
3.	Direct visualization of catheter in tube	14 (73.6%)
4.	Unilateral pelvic pain	12 (63.2%)

Table II
CLINICAL PROFILE OF PATIENTS WHO CONCEIVED ON ULTRASOUND GUIDED SIFT (N = 6)

Pt. No.	Age (yrs)	Parity P	Parity G	Duration of Infertility	Diagnosis
1.	34	0	0	14	unexplained
2.	28	0	1	8	bilateral mild hydrosalpinx
3.	26	0	0	6	unexplained
4.	25	0	1	9	unexplained
5.	25	0	0	3	unexplained
6.	26	0	2	7	oligospermia

P : Parity; G : Gravidity

lower abdominal pain that lasted for 3 to 5 days after the procedure. No patient had vasovagal attack or giddiness.

DISCUSSION

The results of the present study confirm that tubal canulation is possible with transcervical catheters in accordance with the current literature (Hurd et al 1992, Jansen et al 1988). The normal site of fertilization and early embryonic development is the junction of the isthmus and the ampulla. Theoretically, intratubal procedures should provide a more embryotropic environment than intrauterine procedures.

Since the technique of transcervical catheterization of the fallopian tube was first described by Jansen & Anderson in 1987, Jansen et al 1988 and Lucena et al 1989 both reported pregnancies after intratubal insemination under ultrasound guidance. Subsequently, Bauer et al 1990 presented results on transvaginal tubal embryo stage transfer without U/S guidance. Pratt et al in 1991 have communicated a method by tactile sensation with a 24% pregnancy rate per cycle in 32 patients.

In our own study, we had an overall pregnancy rate of 32% (and a rate of 26% per cycle in 19 patients) which is corroborative with literature. The advantages that SIFT offers over existing transtubal procedures are that it uses an 18 G epidural catheter for the transfer which brings down the cost of the procedure dramatically. This has a great relevance in a developing economy like India. Moreover, it increases the number of motile sperms in the immediate vicinity of the oocyte and by obviating the need of anesthesia, it becomes a simple office procedure.

It is disconcerting that 4 of the conceptions occurred in the preovulatory phase while logically the procedure should be

more successful after ovulation. No satisfactory explanation can presently be offered. Complications like PID and endometriosis require a longer follow up on a larger study group. We think that further development of this non operative technique will improve the results of assisted reproduction procedures.

Several studies have been conducted to compare the standard IUI (Intrauterine Insemination) with intratubal insemination and their results have been controversial. In two of the prospective studies (Hurd et al 1993, Oei et al 1993) authors have failed to find any advantage of ITI over IUI. However a study by Fanchin et al 1995 employs the technique of fallopian tube sperm perfusion in which direct insemination is done without tubal catheterization and their results indicate a significant improvement of pregnancy rates in comparison with IUI (40% vs. 20%, respectively).

The currently existing controversies clearly indicate that additional evidence from large, multicentric studies demonstrating the relative advantages and benefits of transtubal insemination over IUI is needed before recommending the routine use of this method of insemination.

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