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## Single versus double intrauterine insemination (IUI) in women with idiopathic subfertility

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Osama M Warda, Maged R Elshamy, Adel S Helal, Hosam Goda  
Obstetrics and Gynecology Department, Faculty of Medicine Mansura University

### Abstract

**Objective:** To compare pregnancy rates per treatment cycle of controlled ovarian hyperstimulation (COH) among patients receiving COH with single IUI with patients receiving two IUIs and those who practice regular sexual intercourse

**Materials & Methods:** All of the 300 studied women were diagnosed as idiopathic infertility and their husbands were having normal seminogram. They were divided into 3 subgroups each 100 women: G1; received induction of ovulation and advised to have a normal and frequent regular intercourse during the period around ovulation. G2; received induction of ovulation and subjected to IUI after 30 hours of HCG injection which is given in a dose of 10,000 iu intramuscular based on ultrasonic monitoring of folliculogenesis. G3; received induction of ovulation and subjected to intrauterine insemination after 30 hours and 42 hours of HCG injection.

**Results:** A total of 300 patients were randomized among groups 1, 2, 3 (100 women per group) cycles). Data analysis demonstrated no significant differences among 3 groups with respect to age, Body mass index, Mean ovarian volume, LH, FSH, PRL, E2 or Testosterone levels (table -1). However, Our result showed a pregnancy rate 2% in the first group, 10% in the second group and 11% in the 3rd group with statistically significant difference between single and also double IUI and normal frequent intercourse without insemination but no statistical difference between single and double IUI as regards pregnancy rate (table -2)

**Conclusion:** We concluded that double insemination not beneficial more than single insemination in spite of increasing the number of motile sperm.

**Keywords:** idiopathic infertility, intrauterine insemination, IUI Introduction

Intrauterine insemination (IUI) is one of the most commonly performed treatments for infertile or hypofertile couples. Although the technique was first reported by Dickinson in 1921 (1), it was not until the 1980s when IUI started to become popular. Over the past twenty-five years, there has been a substantial amount of research evaluating this method. As in much of infertility, methodological problems preclude clear conclusions. In particular, well-planned randomized controlled trials are rare. However, the data available allow to scientifically treat patients even if the science is not perfect (2).

The success rates of IUI depends on the use or non use of ovarian stimulation, the number of insemination per treatment cycle, different methods of timing ovulation and different sites of insemination (3). Semen preparation offers sperms with progressive motility while seminal fluid and dead sperms are removed. Although there are alternative methods of insemination like intravaginal, intracervical using cap, intratubal or direct intraperitoneal insemination, IUI appears to be the preferred method in most studies (4)

Male factor of infertility affects between 25 -50% of infertile couples. Many couples with male infertility are not absolutely infertile but are subfertile (5). It would be cost effective to start with less invasive and less expensive method before proceeding to more complicated treatment. IUI was shown to be effective in a wide range of sperm abnormalities causing male factor subfertility (6).

Intra uterine insemination with or without controlled ovarian hyper stimulation (COH) is one of the treatment modalities offered to couples who have tried to conceive for at least one year. Insemination is less stressful, invasive and expensive than IVF and similar procedures. It is therefore often used when a male partner is subfertile, or when the reason a couple is not becoming pregnant is unknown (7)

Superovulation with intrauterine insemination is a treatment modality used in unexplained infertility and mild male infertility. Increasing the efficiency of the technique has always been an interest of research. Double intrauterine insemination has been suggested to increase efficiency (8)

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Osama M. Warda, MD  
Assistant professor of OB/GYN  
Mansura faculty of medicine  
Address: Obstetrics & gynecology dept. Mansoura University hospital- Mansura  
E-mail : om2warda@yahoo.com, osamawarda@gmail.com  
Mobile: 0106 615 32 12

## Materials & Methods

Three hundred consented women attending the outpatient department of fertility care unit of Mansura University Hospital during the period from January 2008 to December 2009 were enrolled in the study. The main complaint is subfertility.

Thorough history taking, clinical examination, abdominal and pelvic ultrasound, HSG and/or laparoscopy for tubal patency as well as routine laboratory investigations (reproductive hormones and thyroid functions) are performed to all the studied women to exclude systematic or metabolic diseases. All patients with endocrinal disease or under hormonal therapy were excluded from the study.

All of the studied women were diagnosed as idiopathic infertility and their husbands were having normal seminogram. They were divided into 3 subgroups each 100 women: First group; received induction of ovulation and advised to have a normal and frequent regular intercourse during the period around ovulation. Second group; received induction of ovulation and subjected to IUI after 30 hours of HCG injection which is given in a dose of 10,000 iu intramuscular based on ultrasonic monitoring of folliculogenesis. Third group; received induction of ovulation and subjected to intrauterine insemination after 30 hours and 42 hours of HCG injection.

**Semen Preparation:** Semen for insemination, either intrauterine or in vitro, must be prepared to remove seminal plasma products and/or select the healthier population of sperm prior to use. Traditionally, a double wash technique is performed, with or without subsequent swim-up to isolate the motile fraction if necessary. Semen samples were prepared in human tubal fluid media supplemented with 5% human serum albumin (HSA; location 1) with the double sperm wash (SW) procedure.

**The IUI Procedure:** The patient placed in lithotomy position. The cervix is exposed and gently wiped with cotton ball soaked in warm sterile saline, and then the insemination catheter is attached to a 1 ml syringe. The sperm sample is loaded into the catheter at a volume of 0.3 – 1 ml then the catheter is gently passed through the cervical canal into the uterine cavity & semen sample is slowly expelled. We avoid touching the fundus of the uterus as it might cause uterine contraction.

Statistical analysis was performed using SPSS statistical computer program. Comparison between two groups was via the use of Pearson uncorrected test.  $P < 0.05$  was considered significant.  $\chi^2$  – square used for non parametric values.

## Discussion

Ovarian stimulation is a key element of different types of subfertility treatment (9). It has been shown that the number of fertilized oocytes achieved directly correlates with the chance of achieving a pregnancy (10). Intrauterine insemination with or without superovulation is the initial step in assisted reproductive technologies (8).

Timing of IUI is an important factor that may affect its success. This is due to the fact that the sperms probably survive for a shorter period after IUI, since they are not deposited in the cervical crypts as in the case of normal coitus. Timing of ovulation by the LH rise is more accurate than the LH peak itself. Insemination is preferred the day after the initiation of LH surge or 36 hours after administration of HCG (10).

Although many studies showed no difference between single versus double insemination (8-10), other studies showed that double insemination may result in a significant increase in pregnancy rates specially in couples with low sperm count or male factor infertility (11).

Our result showed a pregnancy rate 2% in the first group, 10% in the second group and 11% in the 3rd group with statistically significant difference between single and also double IUI and normal frequent intercourse without insemination but no statistical difference between single and double IUI as regards pregnancy rate. Our result in agreement with Contineau et al (9) who stated that double IUI showed no significant benefit over single IUI in the treatment of subfertile couples with husband semen. Also Ransom et al (12) found that no significant difference in pregnancy rates (11 and 14 %) between single and double IUI of partners. But contrarily Deary AJ et al (13) stated that the switch from single to double inseminations has resulted in improved pregnancy outcomes.

We concluded that double insemination not beneficial more than single insemination in spite of increasing the number of motile sperm.

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**Table 1:** Patients' characteristics of the study groups

	Group1	Group2	Group3	p value
Age in years		28 ± 3	27±4	NS
Height in cm	165 ±4	168 ± 3	166 ± 3	NS
Weight in kg	66 ± 2	65 ± 3	66 ± 3	NS
Body mass index (kg/m <sup>2</sup> )	24.3± 0.5	23.1 ± 0.8	24.4 ± 0.1	NS
Mean ovarian volume in ml	6.1± 0.2	6.3 ± 0.3	6 ± 0.1	NS
LH ( IU\L)	6.5± 0.3	6.7±0.5	6.6 ± 0.1	NS
FSH ( IU\L)	5.5 ± 0.2	6 ±0.1	5.8 ± 0.1	NS
PRL ( ng\ml )	12 ± 0.8	13 ± 0.1	12.5 ±0. 2	NS
E2 ( pgm\ml)	71 ± 6	70 ± 5	70 ± 4	NS
Testosterone	0.5± 0.02	0.5± 0.03	0.4 ± 0.06	NS

**Table 2:** pregnancy rate per cycle (PRC) in women in the 3 groups

Group 1	Group 2	Group3	P value
2%	10%	-	0.037
2%	-	11%	0.021
-	10%	11%	1

PRC in G1= 2%, in G2= 10%, in G3= 11%