

RESEARCH ARTICLE

**Examining the effect of the  
stress of assisted  
reproductive treatment  
(Intrauterine Insemination)  
on semen parameters prior  
to and on the day of  
intrauterine insemination**

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**ABSTRACT**

One of the factors responsible for male factor infertility comprises disorder in sperm count, motility, p Hand sperm morphology. Intrauterine Insemination (IUI) has been widely used for the treatment of infertile couples as a result of male factor infertility. The effect of psychological stress on men and women receiving IVF treatment has been extensively studied, but its effect on men having IUI has not been well known; therefore, this study aims to evaluate the association between the IUI process, which is consider edanacute psychological stress in infertile men, and changes in semen quality. The present paper is an epidemiological study carried out on men referred to the infertility clinic of Jahad Daneshgahi of Ahvaz. Of the patients referred to the clinic, 120 men, who were for the first time candidates for receiving IUI and met all the entry requirements of the study based on the initial sperm analysis results on the day of the visit as well as the prepared questionnaire on the day of IUI, were studied. Sampling was done twice with T1 being (the first visit) and T2 being (the day of IUI) within four weeks.

## INTRODUCTION

Infertility refers to the inability of a couple to give birth a child after one year of intercourse without using means of preventing pregnancy. According to the World Health Organization, infertility affects about 80 million couples worldwide, with 50% as a result of male factor infertility. Based on the research carried out, the prevalence of infertility has been estimated at about 10-15% in the U.S. and 19% in Australia. In 2009, the prevalence of infertility in couples aged 21 to 26 was estimated at 2.17% (1-4). Some causes of male infertility include endocrine disorders, complications of sexual intercourse, chromosomal abnormalities, varicocele and mechanical obstruction. Men with abnormal spermiogram for which no cause is found, assisted reproductive treatments such as IUI (intrauterine insemination) & IVF (in-vitro fertilization) can be useful. Meanwhile, fertility treatment performed by IUI is the best and most effective treatment for men's infertility (5-10). Experience of infertility that some have called infertility crisis is associated with

physical, economic, psychological and social stress. Infertile couples experience a wide range of emotional and physical stress during their efforts to have a baby. The amount of stress is more, especially among patients having interventional procedures. The effect of psychological stress on women receiving IVF treatment has been widely studied, but its effect on men having IUI has not been well known. Previous studies have shown that stress has a negative effect on various parameters associated with semen quality, including sperm count, sperm motility and morphology. Also, the reduction of semen quality in patients undergoing IVF has been similarly shown (11 - 17). However, little research has been done on the effect of psychological stress on changes in the semen of the patients undergoing IUI; therefore, the main objective of this paper is to evaluate the association between the IUI process, which is considered an acute psychological stress in infertile men, and changes in semen quality.

## MATERIAL AND METHOD

The present paper is an analytical study

conducted on 120 IUI candidates under age 40 referred to the infertility clinic of Jahad Daneshgahi of Ahvaz. According to the results of the initial sperm analysis on the day of the visit as well as the prepared questionnaire, those meeting the entry requirements were allowed to enter the study after informed consent was obtained from all of the participants. On the day of insemination and before sampling, the participants were asked to fill out a questionnaire which included questions such as death of loved ones, job stress, legal conflicts, medical conditions or recent febrile illnesses, drug abuse or other tranquilizers over the past three months. Those who had any of the cases mentioned in the questionnaire were excluded from the study. Sampling was done at two intervals with T1 being (the first visit) and T2 being (the day of IUI) within four weeks.

### **Semen Collection and Evaluation:**

Semen was collected in sterile containers at the infertility clinic of Jahad Daneshgahi. The patients were asked not to have sex 3 to 5 days before semen collection. After collecting the samples, they were kept at a temperature of 30-45

degrees centigrade for liquefying the samples. After the liquefaction was completed, all the samples were pipetted into the test tubes while the analysis of semen including semen volume, viscosity, color and pH was being done. Then, by using a direct the microscopic evaluation of sperm including sperm count, motility (percentage of motile sperm) and morphology was carried out. The data related to sperm count, sperm motility, volume and morphology along with the pH of T1 and T2 were inserted in tables and the results were analyzed by SPSS statistical software. Normality of data was evaluated using Kolmogorov- Smirnov and the normal data (sperm volume) were analyzed using paired t-test. Wilcoxon test was applied for data with no normality (other variables).

### **RESULTS**

In this study, 120 infertile couples who were candidates for having IUI were studied at two intervals, T1 (the first visit) and T2 (the Day of IUI). The table below shows the results. The data analysis indicated that, of the semen quality parameters examined in this

study, sperm motility in T1 (the first visit) in comparison to T2 (the day of IUI) with an average of  $46.07 \pm 10.46$  against  $43.16 \pm 8.61$  and  $p < 0.001$  showed a significance association. Sperm motility at two intervals from 120 male participants, with 79 patients a decrease of (65.8%), 34 patients an increase of (28.3%) and 7 patients.

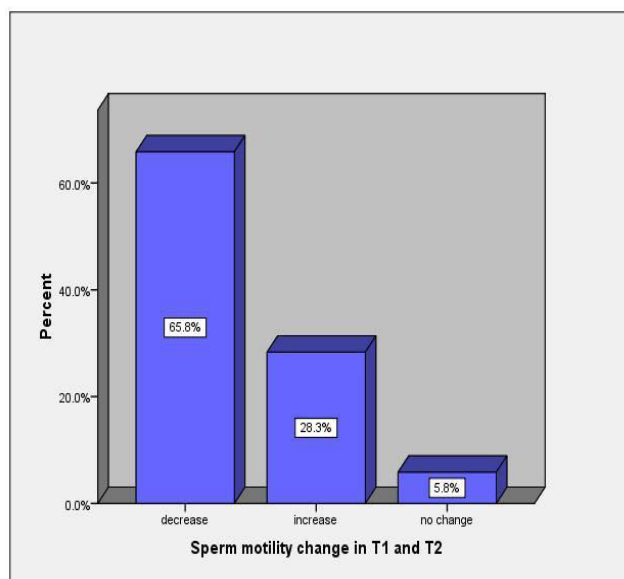


Diagram shows sperm motility in two stages, T1 and T2 According to the results, the total sperm count in two stages with an average of  $42.06 \pm 24.09$  against  $43.29 \pm 23.13$  and a p-value of 0.24 ( $p = 0.24$ ) revealed no significant difference. The other parameters including pH, sperm size and morphology, with a p-value of  $p > 0.05$

showed no significance association with the stress of having IUI.

## DISCUSSION

The stress of infertility involves interaction between physical conditions of predisposing infertility and medical interventions, reactions of others and individual psychological characteristics that can last for years and can recur after every diagnostic or therapeutic intervention (17). The stress level of this type is higher, especially among patients having interventional procedures. The effect of psychological stress on women receiving IVF treatment has been studied well; however, its effect on men having IUI has not been studied as well. Three important parameters i.e., sperm count, sperm motility, and sperm morphology are used to analyze semen. Based on the research carried out, stress in general reduces these parameters (13).

In a study we conducted on 120 infertile couples so as to examine the association between the stress of having IUI treatment and semen quality, we found out that sperm motility in sperm analysis on the day of IUI decreased by 65.8% compared to the first visit, which revealed an inverse relationship with the stress of having this procedure. Also, the total sperm count, semen volume

and morphology in two stages (at two intervals) did not show a significant relationship. Motility of sperm is a major characteristic for fertility and fertilization as sperm must travel a long distance to reach the egg, and must also have enough motility to make a hole in coronal cells surrounding the egg, zonapellucida, and egg cell membrane. Moreover, the percentage of sperm motility in the studies conducted has been a factor which considerably affects IUI prognosis

(1). Harrison et al in a study conducted on men undergoing IVF treatment concluded that the total sperm count and sperm motility both, which are affected considerably by the stress of having this procedure, decrease substantially, while semen volume and morphology remained constant (13). In this study, while sperm motility decreased, there was no significant relationship between the total sperm count, semen size and morphology.

In a study conducted by Kentenich in 1992, sperm density in 36% of men undergoing IVF treatment on the day of ovum withdrawal decreased compared to the first visit, while sperm motility showed a significant relationship (17). In a study done by Clark et al in 1999, they showed that the total sperm count and sperm motility in a

large percentage of men undergoing IVF treatment in two stages (at two intervals) T1 and T2 decreased considerably (12).

Dr. Kazem Nouri in a study carried out in 2013 on 155 men who were candidates for receiving IVF treatment regarding the association of semen quality and chronic stress using the FPI questionnaire.

Concluded that changes in the total sperm count and progressive motility of sperm in two stages (at two intervals) were not significant and rejected the relationship of stress with semen quality reduction during IVF treatment. However, they stated that the stress of men may be associated with poor pregnancy outcomes (14). Following the stress of having IUI treatment, this study showed that, of the semen parameters, sperm motility decreased and the other parameters including the total sperm count, semen volume and morphology did not change considerably. In other studies conducted in this regard so far, there have been many contradictions between their results which may be due to the causes of such differences in the sample size studied, the “how “of stress level evaluation; therefore, it can be said that more and wider research in this regard can be a solution. The results of this study to a certain extent show the stress placed on men undergoing IUI treatment. In this study, we focused on the

effect of chronic stress on semen quality, and given the fact that a period of 70-80 days for sperm differentiation process is recommended by the use of a questionnaire such as FPI, the type and level of the stress and the effect of chronic stress on semen quality were determined. As mentioned, not only infertility affects women, but it also affects men and thus it

Is recommended that in every stage of the assisted reproductive treatment, information such as causes of infertility, the prevalence of infertility, the length of time it should be treated, and alternative methods available be presented to couples, and that their questions be answered, or even group meetings for infertile couples be formed. It's highly likely that counseling sessions prior to performing IUI

Changes in semen quality and improve the results of assisted reproduction techniques. It is recommended that more research on counseling measures to reduce the stress of men undergoing IUI treatment be conducted and their effects on semen quality parameters and the results of IUI be examined. Treatment and giving enough information to men who are candidates for receiving IUI treatment can be a good way in order to reduce stress and minimize stress-induced

## REFERENCES

1. World Health Organization, 2010. Department of Reproductive Health and Research. WHO laboratory manual for the examination and processing of human semen 5th ed. Geneva: WHO; 85-116.
2. Mohammadi K, Ardalan A, Vahidi S, 2006. Assessment of prevalence of primary infertility in islamic republic of iran in 2005; J FertilInfertil; 7 (3):243-51.
3. Nangia AK, Luke B, Smith JF, Mak W, Stern JE, 2011. SART Writing Group.National study of factors influencing assisted reproductive technology outcomes with male factor infertility;FertSteril ;96(3):609-14.
4. Vahidi S, Ardalan A, Mohammad K, 2009. Prevalence of primary infertility in the Islamic Republic of Iran in 2004-2005; Asia Pac J Public Health Jul; 21(3):287-93.
5. N. Simforoosh, M.D, A. Nouralizadeh 2011. General urology: 455-467
6. haebe J, M artin J,Tekepety F, 2002. success of intrauterine insemination in women aged 40-42 years.fertile steril;78:29
7. Dovey S, sneeringer RM, Penzias AS,

2008. Clomiphene citrate and intrauterine insemination: analysis of more than 4100 cycles. *fertil steril*;90:2281
5. Campana A, Sakkas D, Stalberg A, 1996. intrauterine insemination: evaluation of the results according to the woman's age, sperm quality, total sperm count per insemination and life table analysis. *Hum reprod*;11:732
  6. Merviel P, Heraud MH, Grenier N, 2010. Predictive factors for pregnancy after intrauterine insemination (IUI): an analysis of 1038 cycles and review of the literature. *fertil steril*;93:79.
  7. Harris ID, Missmer SA, Hornstein MD, 2010. poor success of gonadotropin-induced controlled ovarian hyperstimulation and intrauterine insemination for older women. *fertil steril*;94:144
  8. Sadeghian A, Heydarian pour A, Abed F, 2004. Comparison psychological problem of male and female that referred to infertility clinic of Fatemeh Hospital in Hamedan in; *J Arak Univ Med Sci* 2006;14 (9) 1-6.
  9. Robert N. Clarke, Susan C. Klock, Anne Geoghegan, 1999. Relationship between psychological stress and semen quality among in-vitro Fertilization patients *Human Reproduction* vol;14 no.3 pp.753–758
  10. Harrison, 1987. Stress and semen quality in IVF program. *the American fertility society*. vol.48, No.4.
  11. Kazem N, Brigitte L, Michael S 2014. Decline of semen quality during IVF is not associated with subjective male stress; *Asian Journal of Andrology* 16,597–601
  12. Fanuel L, 2009. Variation of semen parameters in healthy medical students due to exam stress; *Malawi Medical Journal*; 21(4):166-167.
  13. Laura F, David F, Andrew J, 1997. Effects of Psychological Stress on Human Semen Quality; *Journal of Andrology*. Vol. 18. No. 2.
  14. Kentenich, 1992. The male IVF patient-psychosomatic consideration. *Hum.reprod*.7.13-18.



<b>Table shows semen quality parameters in two stages, T1 and T2</b>			
<b>Mean <math>\pm</math> SD</b>			
	<b>T1</b>	<b>T2</b>	<b>p-value</b>
Sperm Count	42.06 $\pm$ 24.09	43.29 $\pm$ 23.13	0.246
Sperm Motility	46.07 $\pm$ 10.46	43.16 $\pm$ 8.61	< 0.001
Semen Volume	3.36 $\pm$ 1. 34	3.38 $\pm$ 1.40	0.892
pH	7.78 $\pm$ 0.05	7.74 $\pm$ 0.21	0.06
sperm Morphology	3.42 $\pm$ 2.15	3.17 $\pm$ 1.99	0.214