Original Article

The effect of assisted reproduction treatment on mental health in fertile women

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ABSTRACT

Introduction: The process of assisted reproductive treatment is a stressful situation in the treatment of infertile couples and it would harm the mental health of women. Fertile women who started infertility treatment due to male factor infertility have reported to experience less stress and depression than other women before the assisted reproductive process but considering the cultural and social factors and also the etiology of the assisted reproductive process, it could affect the metal health of these women. Therefore, this study was conducted to evaluate the mental health of fertile women who undergo assisted reproductive treatment due to male factor infertility. **Materials and Methods:** This study was a prospective study on 70 fertile women who underwent assisted reproductive treatment due to male factor infertility. The exclusion criterion was to stop super ovulation induction. To assess mental health, anxiety and depression dimensions of the general health questionnaire were used. Before starting ovulation induction and after oocyte harvesting, the general health questionnaire was filled by women who were under treatment. Data were analyzed using multi-variable linear regression, paired *t*-test, and Chi-square. **Results:** The results showed that the mean score of depression and anxiety before ovulation induction and after oocyte harvesting were not significantly different; but the rate of mental health disorder in the depression dimension was significantly decreased after oocytes harvesting (31.7% vs. 39.7%). Also, there was a significant relation between the level of anxiety and depression before ovulation induction and after oocyte harvesting ($P < 0.05$). The anxiety level after oocyte harvesting had a positive and significant correlation with the economic situation ($P < 0.05$). **Conclusion:** This study revealed that the process of assisted reproductive treatment does not affect the mental health in fertile women independently, but these women start assisted reproductive process with high levels of depression and anxiety. Therefore, prior to the assisted reproductive treatment mental health consultation is needed.

Key words: Assisted reproductive treatment, fertile women, male factor infertility, mental health

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INTRODUCTION

Infertility is one of the crucial and critical events in sex life which engages 10–15% of couples all over the world,[1] and as

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one of the most distressful life experiences, exposes couples to social and psychological problems.[2,3]

Couples, who are faced with this critical situation, are prone to depression, anxiety,[3,4] loss of self-esteem and dissatisfaction with their sex life more than others.[5] However, the intensity of psychological problems resulting from cultural-social circumstances varies in different societies, to the point that the frequency of anxiety in infertile couples has been reported in a wide range from 48% to 96%.[6]

Although, the advances in assisted reproductive techniques have opened new doors for infertile couples, but studies have shown that these treatments are accompanied with stress, anxiety and depression.[6,7] But the intensity of these disorders could be defined by the cause of the infertility. Evaluating the related factors of depression and anxiety among Iranian infertile couples showed that women who were infertile themselves showed higher levels of anxiety and depression than women with male factor infertility.[8]

However, in societies that define women as the main source of fertility, starting assisted reproductive treatments with limited successful outcomes could be harmful to these women's mental health. Utilization of assisted reproductive techniques requires processes such as daily injection to stimulate ovulation, vaginal ultrasound and painful processes such as oocyte aspiration which are all too expensive and alongside with the fear of failure could become a harmful condition.[9]

Although, fertile women, who start assisted reproductive treatments due to their husband's infertility have natural biological conditions to get pregnant, but they have to tolerate these critical processes due to male factor infertility. Also, women are under more cultural and social pressures.[10] These conditions could affect the vulnerability of fertile women during assisted reproductive treatment; therefore the aim of this study was to evaluate the effect of assisted reproductive treatments on fertile women's mental health.

MATERIALS AND METHODS

Thus, the prospective study conducted on 70 fertile women who referred to receive assisted reproduction treatments (*in vitro* fertilization/intracytoplasmic sperm injection) due to male infertility. Subjects had referred to the Fertility and Infertility Center of Esfahan from September 2013 to March 2014. The number of samples was calculated based on 80% test power and 95% confidence level. Inclusion criteria were primary infertility, not having any corporal and mental illnesses, not being a drug addict according to individual's report, not having a history of mental illnesses, and not experiencing severe distress over 1-month prior to the treatment based on Holmes-Rahe scale. Exclusion criteria included experiencing distressful conditions during the study, discontinuation of the treatment and the cancellation of egg harvesting. The study was approved by the Medical Ethics Committee of the Isfahan University of Medical Sciences. Consent letters in consciousness were collected from all participants.

Mental health evaluation tool was the valid 28-questioned general health questionnaire that measures mental health on Likert scale (0–3) in hypochondriasis, anxiety, social impairment, and depression dimensions.[11] In this method gaining the score of 5 in each subscale and 23 in all dimensions together was defined as having a mental disorder.[12]

Sampling was conducted through simple sampling; that is, all persons, who referred to Fertility and Infertility Center of Esfahan for treatment and to start the process protocol due to male factor infertility were interviewed. Then by referring to their medical records and conducting Holmes-Rahe scale, their eligibility for the study was assessed. After being considered eligible for entering the study, their demographical features including age, educational level of couples, economic condition, and the duration of their infertility were recorded. Also, their general health was assessed using the questionnaire.

Ovulation was stimulated through the long protocol in all the participants. During the treatment period, ovarian reaction conditions and number of injections employed for ovarian stimulation were followed-up. 3 h after the pickup process, and under appropriate circumstances, the questionnaire for general health was completed again. If the circumstances were inappropriate filling of the questionnaire was delayed for 2 h.

Research data were analyzed using SPSS software version 16 [SPSS Inc.: Chicago, IL, USA], statistical paired *t*-tests and multi-variable linear regression tests. The $P < 0.05$ was considered to be significant.

RESULTS

Of the selected 70 participants, 63 remained in the study. Seven qualified subjects quit the study because of the unwillingness to continue (three persons) and ovarian hyper stimulation (four persons). Table 1 shows the demographic and clinical data.

Results showed no significant difference in the mean score of different dimension of mental health before ovulation induction and after oocyte harvesting [Table 2]. Also, the rate of psychological disorder in the anxiety dimension showed no significant different before the induction (71.4%) and after the pickup (66.7%) ($P = 0.19$). But the level of depression after pickup (31.7%) was significantly lower than before the induction (39.7%) ($P = 0.007$).

Results showed no significant difference in the dimension of hypochondriasis before the induction (61.9%) and after the harvesting (66.7%) ($P = 0.07$). Also, the level of social impairment showed no significant difference before the induction (84.1%) and after the pickup (87.3%) ($P = 0.08$).

The results of multi-variable linear regression to evaluate the relation between underlying variables and mental health condition before starting the process with the level of depression and anxiety after the harvesting are shown in Table 3.

The level of depression after egg harvesting was related to physical condition, depression and social impairment, independent from underlying variables. Also, the level of depression after egg harvesting was related to the economic condition, it also showed a significant relation with social impairment and hypochondriasis [Table 3].

Table 1: Demographic and clinical data

Variales	Mean (SD) and number (%)
Age (mean (SD))	29.17 (4.11)
Educational level (%)	
Illiterate	1 (1.6)
High school	13 (20.6)
Diploma	27 (42.9)
Academic degree	17 (27)
Economic status (%)	
Low	8 (12.7)
Medium	36 (57.1)
High	19 (30.2)
Duration of infertility (mean (SD))	5.84 (3.68)
Number of retrieved oocytes (mean (SD))	9.76 (5.84)

SD=Standard deviation

Table 2: Comparison of mental health dimensions B and A

General health dimensions	Mean (SD)		*P*
	B	A	
Hypochondriasis	6.6 (4.16)	6.6 (4.32)	0.97
Anxiety	7.17 (4.25)	7.01 (4.66)	0.79
Social impairment	7.04 (2.69)	7.1 (2.57)	0.9
Depression	4.04 (3.94)	3.5 (3.87)	0.2

SD=Standard deviation, B=Before ovarian induction, A=After ovarian induction

DISCUSSION

The present study aimed to assess the level of mental health in fertile women undergoing assisted reproductive treatments as a result of male factor infertility, at the beginning of ovulation stimulation process, and the effect of this process on their mental health. Results showed that these women do not start assisted reproduction treatment under appropriate mental health conditions. Occurrence of depression and anxiety to some extent among infertile couples is common.[3,4] But the level of depression and anxiety disorders at the beginning of ovulation stimulation was higher in the present research than other reports.[8] This would indicate that the process of treatment in fertile women is also a critical one and might affect their mental health. In a pursuit, to achieve a conceptual model for the effect of ovulation induction on women's health, its negative effects on women's functioning and health have been shown.[13]

A qualitative study showed that Iranian infertile couples show emotional reactions such as fear, concern, anxiety and depression as a result of fear of the failure of treatment during fertility treatment.[10] However, these mental disorders may be harmful even for women with appropriate fertility potentials. Also being angry with their husbands due to their infertility[14] could be another explanation for women's mental reactions.

Positive correlation between the level of depression and anxiety and other dimensions of experiences during infertility treatment might be accompanied with social impairment, thus affecting the levels of depression and anxiety.[15] These might be resulted from their awareness of their inability to control the circumstances.[9] Efforts to conceal infertility and efforts to get treatment as a result of concerns about being labeled as "infertile,"[15,16] are common among Iranian couples. This, by itself, could increase the level of anxiety among women when treatment starts.

Another reason for the high level of depression and anxiety among women at the beginning of the ovulation stimulation

Table 3: The relation between mental health dimensions and background variables after ovulation stimulation

Variables	Depression A				Anxiety A			
	Beta	*P*	95% CI		Beta	*P*	95% CI	
			Lower	Upper			Lower	Upper
Age	−0.01	0.95	−0.22	0.20	−0.15	0.27	−0.41	0.12
Education	0.59	0.11	−0.14	1.32	0.31	0.5	−0.60	1.23
Economic status	0.37	0.58	−0.96	1.7	1.9	0.03	0.22	3.56
Duration of infertility	0.10	0.42	−0.14	0.34	0.22	0.16	−0.09	0.52
Social impairment B	0.07	0.73	−0.33	0.47	0.34	0.19	−0.17	0.84
Hypochondriasis B	0.31	0.04	0.01	0.62	0.20	0.30	−0.18	0.57
Anxiety B	−0.23	0.15	−0.54	0.08	0.32	0.11	−0.08	0.71
Depression B	0.57	<0.00	0.28	0.86	−0.09	0.65	−0.45	0.28
Social impairment A	0.55	0.001	0.23	0.87	0.66	<0.00	0.32	1.01
Hypochondriasis A	0.20	0.10	−0.04	0.44	0.51	<0.00	0.25	0.77
Follicle number	−0.02	0.76	−0.18	0.13	0.07	0.46	−0.12	0.27

B=before ovarian induction, A=After ovarian induction, CI=Confidence interval

might be the negative impact of gonadotropin-releasing hormone (GNRH) agonists on the mental health.[17] Although, this research did not evaluate mental health before and after the beginning of GNRH agonists, but this might explain women's psychological disorders before ovulation stimulation regarding high frequency of mental disorders at the time of ovulation stimulation.

With regards to the negative impact of anxiety and depression during the treatment on the result of assisted reproduction treatment,[18] it is necessary that this group of women would be examined before the treatment process, since they are exposed to risks of mental health disorders, and be treated in case of high levels of depression and anxiety.

Following the assessment of the main hypothesis of the research, that is the effect of ovulation stimulation on women's mental health, study results showed that ovulation stimulation does not affect mental health; the level of depression and anxiety, and the measure of psychological disorders in these two-dimensions did not show a significant difference before the ovulation and after the harvesting process. On the contrary, the depression level was decreased after the harvesting process. The negative impact of distress of infertility treatment on the level of depression has already been reported.[19] The cessation of treatment distress with the conclusion of ovulation stimulation and harvesting processes might be a reason for the decrease of depression level in subjects under study.

Furthermore, results showed that fertile women's level of depression and anxiety does not depend on the reaction of the ovary to the ovulation stimulation, and as these women have no problem in ovarian response to ovulation stimulation, their mental health depends more on other factors.

In addition, all subjects, who sustained the research were those who reached the stage of the harvesting process; the potential for ovum production was proven for these women. This would enhance the self-esteem of subjects and decrease their concern over ovarian nonresponsiveness. But direct correlation between the level of anxiety and depression in the stage after harvesting process with social impairment and hypochondriasis indicates that in this stage also the awareness of social dysfunction, independent from financial status, will have its own effect on mental health.

Factors other than ovulation stimulation process which might influence the individuals' levels of depression and anxiety have not been assessed in the present research. Depression and anxiety might result from a variety of factors, which require more extensive research.

Another result of this research was that financial status, independent from the quantity of follicle obtained from ovulation stimulation, showed a reverse correlation with anxiety level after harvesting process. In Ozken's research, also financial status was a factor determining the anxiety in infertile couples.[12]

Regarding financial pressures resulting from high costs of assisted reproduction treatments, which lead to the success of only 35% for each cycle,[1] women's concerns over the success of results in fertilization as an outcome of infertility of the partner detected after harvesting process while insemination in laboratory are not far from expectation.

Nevertheless, although women are healthy in terms of fertility in couples undergoing male factor infertility treatment, effort to have babies not by normal methods and facing difficult, costly treatment protocols might threaten their evaluation of their feminine role, thus reducing their self-esteem.

Another finding of this research was the existence of correlation between depression level after treatment process and anxiety level at the first stage, while this correlation was observed between depression level after treatment process and anxiety level at the second stage. This finding indicates that women, who enter the process of treatment with a higher anxiety level are prone to a higher level of depression; therefore necessary measures should be taken to prevent it.

One of this study's limitations was that mental health assessment was conducted after starting the primary stages of the treatment therefore, the stress of this stage could affect the mental health during the whole process.

CONCLUSIONS

This study showed that fertile women who undergo assisted reproduction treatments do not start the treatment process in an appropriate mental health condition, and this condition would continue during the whole process until egg harvesting. Also, mental health condition during treatment could be predicted through primary evaluations. Therefore, it is suggested that before starting the treatment the mental health of these women should be evaluated using screening tools and counseling sessions would be applied for vulnerable women.

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Conflicts of interest

There are no conflicts of interest.

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