The effect of depression on the outcome of infertile females underwent the first In Vitro Fertilization procedure

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Abstract:

Background: Infertility affects married adults, and In Vitro Fertilization (IVF) is an Assisted Reproductive Technology (ART) that can treat it. Women undergoing IVF are more likely to experience depression. There is a need to reduce depression by supporting and advising sufferers. The aim of this study is to evaluate the effect of depression on pregnancy rates among infertile females underwent IVF treatment.

Materials and Methods:
This observational study analyzed 149 patients attending the infertility center at Kamal Al-Samaraie hospital seeking a chance of a conception. The participants received a traditional hospital protocol. The study assessed depression status using the CES-D (Center for Epidemiologic Studies Depression) scale at the beginning of the IVF cycle.

Results:
The mean age of women included in the study was 30.30 ± 5.65 years with a mean body mass index of 27.03 ± 3.4 kg/m^2. The clinical pregnancy rate was 38.9%. The current study showed that there was no significant relationship between the risk of depression and pregnancy rate (P-value = 0.304).

Conclusion:
Our findings show that the pregnancy rate was not related to baseline depression of women underwent the first IVF procedure.

Keywords: Center for Epidemiologic Studies Depression (CES-D), In Vitro Fertilization (IVF), depression, Assisted Reproductive Technology (ART).

تأثير الاكتئاب على نتائج النساء المصابات بالعقم اللاتي يخضعنَّ لأول عملية تلقيح صناعي

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الخلاصة:
خلفية: يؤثر العقم على البالغين المتزوجين، والتخصيب داخل المختبر هو تقنية مساعدة على الانجاب يمكنها علاجه. النساء اللاتي يخضعن لعملية التلقيح الاصطناعي أكثر عرضة للإصابة بالأكتئاب. هناك حاجة للحد من الاكتئاب من خلال دعم وتقديم المشورة للمرضى. الهدف من هذه الدراسة هو تقييم تأثير الاكتئاب على معدلات الحمل لدى الاناث المصابات بالعقم اثناء عملية اطفال الانابيب.
الادوات والطرق: قامت هذه الدراسة الرصدية بتحليل 149 مريضة يترددن على مركز العقم في مستشفى كمال السامرائي الباحثين عن فرصة للأنجاب. تلقى المشاركات البروتوكول التقليدي للمستشفى. قامت الدراسة بتقييم حالة الاكتئاب باستخدام مقياس مركز الدراسات الوبائية للأكتئاب (CES-D) في بداية دورة التلقيح الاصطناعي.

النتيجة: كان متوسط اعمار النساء المشمولات في الدراسة (30,30 ± 5,65 سنة) مع متوسط مؤشر كتلة الجسم (27,03 ± 3,4). وبلغ معدل الحمل السريري (38,9%). اظهرت الدراسة الحالية لا توجد علاقة ذات دلالة إحصائية بين خطر الأكتئاب ومعدل الحمل (P-value = 0.304).
الاستنتاج: تظهر النتائج التي توصلنا إليها أن معدل الحمل لم يكن مرتبطا بالأكتئاب الاساسي لدى النساء اللاتي خضعن لإجراء التلقيح الصناعي الأول.

الكلمات المفتاحية: عملية التلقيح الاصطناعي، مركز الدراسات الوبائية للأكتئاب, الأكتئاب, تكنلوجية الانجاب المساعد.

Introduction

The inability to conceive after one year of regular, unprotected sexual activity may indicate male or female infertility[1][2]. Couples often view infertility as a major life experience. Infertility may be seen as a cause of anxiety, worry, grief, and disappointment[3,4]. While it is estimated that 15% of couples worldwide experience infertility, this number rises to over 30% in some underdeveloped countries and to between 17 and 28% in industrialized nations[5].

There are numerous factors that can contribute to the occurrence of infertility. For about a quarter of all couples, the etiology remains unknown. Some factors, including ovulatory disorders (25%), endometriosis (15%), pelvic adhesions (12%), tubal blockage (11%), other tubal abnormalities (11%), and hyperprolactinemia (7%), together accounted for 81% of all cases of female infertility[6,7].

Age has a negative impact on the fertility of women, and the prevalence of age-related infertility rises as their reproductive years decrease. Fertility declines with age because of a decline in sexual activity[8].

Assisted Reproductive Technology (ART) is a fertility treatment that involves combining eggs and sperm to create embryos, which are then returned to the mother. In Vitro Fertilization (IVF) is widely recognized as the predominant and highly effective method of ART[9].

Anxiety and depression are more common in infertility patients with psychiatric illness, miscarriage, a longer infertility timeline, and a definitive medical diagnosis[10].

IVF patients suffer considerable anxiety and depression throughout pre-treatment, treatment, and the two-week wait before the pregnancy test. IVF impact on emotional distress is uncertain. A previous study showed that depression lowers IVF pregnancy rates[11].

Measurement of depression

According to the Centre for Epidemiological Studies Depression Scale (CES-D), Nelson et al. (2008) showed that a significant percentage of infertile women experienced depression in varying degrees. Specifically, 19% of the participants reported low levels of depression, while 13% reported major depression[12].

The CES-D scale is a self-report tool used to assess the frequency, severity, and duration of depressive symptoms across various demographics, including race, gender, and age[13].

The depression of infertile females is a major problem which might affect the pregnancy outcome; therefore, the aim of the current study was to examine the clinical risk of depression among infertile women who underwent IVF procedures, and their possible associations with pregnancy rate.

Patients and methods

Ethical Consideration

The research proposal was fully discussed with and approved by the ethical and scientific committee in the College of Pharmacy/ Mustansiriyah University.

The agreement of health authority in Kamal Al-Samarrai hospital was approved before starting data collection.

The written consent was taken from each included patient after a full explanation of the aims of the study and ensuring the patient's confidentiality.

Study design

This study was longitudinal observational study carried out in the period from (1st January 2022-1st July 2022), designed to examine the effect of depressive state of infertile women on outcome of IVF.

Among the many married women who were attending the infertility center at Kamal Al-Samaraie hospital seeking conception, 206 infertile ladies referred to IVF technology, of which 33 were excluded as they did not meet the inclusion criteria.

Of the one hundred seventy-three infertile women who were included in this observational study, 24 were refused and 149 agreed to participate in this study.

Inclusion criteria

The study requires females to meet the following criteria:

1- To be infertile means to have failed to conceive for at least one year after marriage.
2- To be within the reproductive age range (18–45).
3- To be capable of reading and comprehension.

Exclusion criteria

The patients were not eligible if they met any of the following conditions:

1- Patients who have had an IVF attempt fail in the past.
2- Very obese (BMI > 40)[14].
3- Patient with psychiatric issues (such as a history of psychiatric hospitalization, addiction, neurological or other progressive disease, or current use of psychiatric medications).
4- Individual with a condition that makes it difficult to communicate (e.g., language or hearing impairment).

The participants were evaluated and assessed by CES-D score at the beginning of admission of IVF cycle. All patients in this study received frozen embryo transfers (fertilized eggs), not fresh embryos.

Data collection

The patient's data sheet included information about age, residence, duration of marriage, weight, height, and history of IVF and chronic mental disease.

The data collection for each patient took about 15–20 minutes.

Methods and materials

Assessment of depression status

Using CES-D, first published by Radloff in 1977, the depressive state of each patient was determined[15]. The CES-D questionnaire is a 20-item assessment that asks patients to rate how frequently they encounter depressive symptoms, such as disturbed sleep, poor appetite, and feelings of isolation, during the previous week. Answer options vary from 0 to 3 for each question (0 = Rarely or Never, 1 = Some or Little, 2 = Moderately or Often, and 3 = Frequently or Nearly Always)[16].

Scores can range from 0 to 60. As is typical for this instrument in clinical investigations[17,18], high scores indicate more severely depressed symptoms. With excellent sensitivity, specificity, and internal consistency, the CES-D also gives cutoff values (16 or higher) that help identify people at risk of clinical depression. The CES-D has been utilized well across broad age groups[19]. Depression levels were measured at the start of IVF cycle only.

Statistical analysis

The collected data was introduced into Microsoft Excel 2016 and data was loaded into SPSS statistical software (version 26). The descriptive statistics were presented through tables and graphs. Chi-square test and independent T-test were used for statistical analysis. The 95% confidence

interval was established. P-value < 0.05 was considered a discrimination point for significance.

Result

The rate of pregnancy in all included cases was 38.9%.

Patient's demographic distribution

The demographic data of 149 infertile females exposed to IVF procedures are shown in table 1.

Table 1. Distribution of patients, including age, duration of marriage, and BMI of total cases 149

	age in years	duration of marriage in years	BMI
Mean	30.3087	3.7383	27.03
Std. Deviation	5.65912	2.18223	3.400
Minimum	19.00	1.00	21
Maximum	45.00	12.00	39
Data presented as Mean, Standard deviation, Number of patients (N), Minimum and Maximum. BMI= body mass index			

Assessment of Depression status

Table 2 shows that the mean of CES-D of women before IVF procedure. There were no significant differences between pregnant and non-pregnant women in their baseline CES-D score.

Table 2. Association between pregnancy outcome and baseline CES-D

	pregnant			**Non-pregnant**			
	N	Mean	Standard Deviation	N	Mean	Standard Deviation	P-value*
pre- CES-D score	91	21.95	5.01	58	21.71	6.42	0.799^{NS}
Data presented as Mean, Standard deviation, Number of patients (N) and percentage %, * independent T-test Statistics was used in comparison; NS (P-value >0.05) is considered not significant difference.							

Assessment of the risk of clinical depression

Table 3 shows that there is no significant difference between pregnant and non-pregnant women according to the risk of clinical depression (P-value = 0.304).

Table 3. Comparison between pregnant and non-pregnant women according to the risk of clinical depression

	Females with no risk of depression before IVF treatment		Females with risk of depression before IVF treatment		P-value*
	N	%	N	%	

Non-pregnant	9	9.9%	82	90.1%	0.304[NS]
pregnant	9	15.5%	49	84.5%	
Data presented as Mean, Standard deviation, Number of patients (N) and percentage %, * Chi-square test was used for statistical analysis; NS (P-value >0.05) is considered not significant difference.					

Discussion

Infertility is a significant public health issue with medical, psychological, and social implications[20].

In Islamic nations such as Iraq, family status, especially having children, is highly valuable and essential; having a baby will stabilize the family and enhance marital happiness. In today's society, stigmas around infertility are growing. Divorce or even remarriage can occur if children are not present.

Depression is one of the most common psychological problems[21]. A person's ideas, actions, feelings, and overall sense of well-being can all be impacted by depression[22].

All participants in the current study are between the ages of 19 and 45, which is consistent within the reproductive age range[23].

The survey found that the mean age is (30.3087±5.659 years). This may be due to the reproductive age of the Iraqi community as well as the desire to have a baby[24].

This study shows that the mean duration of marriage was 3.73±2.18 years, with a maximum period of 12 years. The result of a previous study conducted in the Erbil Kurdistan Region of Iraq shows that about 55% of infertile females seeking infertility treatment had a marriage duration of 3-7 years[25].

In different countries and regions, the mean duration of marriage among women seeking IVF varies. In India, the data suggests a mean of about 8 years[26]; in Korea, it is about 4 years[27]; and in Italy, more than 50% of couples would seek ART following an average duration of marriage less than 3 years[28]. Those differences are due to the social nature of each country.

Infertility patients experience depression rates comparable to cancer patients, with global symptoms similar[29]. It has been found that infertility-related stress and severe depressive symptoms have a strong connection with social worry, which may be the individual's reaction to social demand for having kids[30,31]. However, the association between IVF treatment outcome and psychological distress is yet unclear[32,33].

The result of this study showed that there is no significant difference in the depressive state between pregnant and non-pregnant women (P-value = 0.799), and also there is no significant difference in the risk of depression between them (P-value = 0.304). The findings of this study were consistent with other researches showing that depression symptoms did not affect the success of IVF treatment[34,35]. However according to the recent meta-analysis of elven studies shows that the women who did get pregnant had considerably lower depression scores than women who did not get pregnant at baseline[36].

According to the results of this study, the success rate of a pregnancy rate of around 38.9%. This result is higher than previous study conducted in Iran, where 142 women underwent IVF who participated in the survey and found the clinical pregnancy rate to be 26.8%[37].

Limitations

When evaluating the results, it is important to take into account the limitations of the current study. First, the results may not be as broadly applicable as they may be because the study was limited to a single center. Secondly, there was a relatively

small study sample. Third, we are not able to investigate the connection between depression and delivery or live birth. Fourth, psychological distress encompasses a wide range of symptoms, but the current study examined one type of psychological distress (depression). Moreover, the study only analyzed IVF, so the findings cannot be generalized to other ARTs.

Conclusion

In our study, we concluded that the rate of pregnancy for women who undergo IVF procedures was not impacted by the depression and quality of life experienced by the patients.

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