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Depression and coping strategies of Chinese women undergoing in-vitro fertilization

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ABSTRACT

Objectives: To explore the relationship between coping strategies and depression, and the risk factors of depression among Chinese women in infertile couples undergoing in-vitro fertilization (IVF).
Study design: Two hundred and eighty-eight women undergoing IVF completed the Center for Epidemiologic Studies Short Depression Scale and the Brief COPE Inventory. Demographic data were collected, hormone levels were tested and oocyte numbers were counted.
Results: The incidence of depression was 22.6%. The prevalence of depression was higher among women who had been married for >8 years, women who had been infertile for >6 years and women with a family income ≤3000 CNY/month. High basal follicle-stimulating hormone, oocyte number and denial score were associated with greater risk of depression. High oestradiol (basal and peak), and substance use and humour scores were associated with lower risk of depression.
Conclusion: Many women in infertile couples undergoing IVF have depression. Preventive interventions should be provided for women with risk factors of depression, such as long duration of marriage, long duration of infertility, low monthly family income, high basal follicle-stimulating hormone, low serum oestradiol, high oocyte number, and use of denial as a coping strategy.

Introduction

Assisted reproductive technology (ART) provides hope for infertile couples. More than 400,000 ART cycles are performed every year worldwide [1]. However, the method of conception, high cost and unpredictable outcome of ART treatment lead to physical and mental stress in couples who undergo ART. Nelson et al. [2] reported that 13–19% of infertile women undergoing ART therapy had moderate to severe depression. Depression rates of 10–18% in Western countries [3,4] and 32–48% in Eastern countries [5–7] have been reported in infertile women undergoing ART therapy.

In-vitro fertilization (IVF) is a multidimensional stressor, including the treatment itself and its unpredictable outcome, which could induce depressive feelings [8]. However, infertile women may feel pressure to appear more psychologically 'healthy' before undergoing IVF, in the fear that reporting symptoms of depression or anxiety might make them ineligible for treatment [9]. Lewis et al. demonstrated that women in the IVF group reported depressive symptoms significantly less often than women in other groups [10]. As such, there is a need to investigate the depressive symptoms of women in infertile couples undergoing ART treatment in order to alleviate their suffering and enhance the therapeutic effect of IVF. It has been shown that depression has no significant influence on pregnancy rates following ART treatment, but stress may reduce the chance of a successful outcome following IVF [11]. In addition, depression may affect infertility treatment, follow-up and hope for the future. It is important to know how women cope with the stress of infertility, and the strategies they use to deal with depression, to improve understanding of depressive symptoms in infertile patients.

This study aimed to examine the relationship between coping strategies and depression, in order to determine whether some coping strategies might be associated with higher levels of depressive symptoms, and to help individuals to alleviate depressive symptoms.

Materials and methods

Two hundred and eighty-eight Chinese women in infertile couples who were referred to the Reproductive Medical Centre, Renmin Hospital of Wuhan University between October 2012 and May 2013 for infertility treatment were included in this study;

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patients with a history of mental illness were excluded. Mean age was 32 [standard deviation (SD) 4.6] years and mean duration of infertility was 5.4 (SD 3.2) years. Of the study participants, 196 (68%) women underwent IVF and 92 (32%) women underwent intracytoplasmic sperm injection.

After obtaining verbal consent from each patient, data were collected using the Center for Epidemiologic Studies Short Depression Scale (CES-D10) [12] and the Brief COPE Inventory (BCI) [13] after oocyte retrieval and before embryo transfer.

The CES-D is used for screening for depression, and has been widely applied in measuring depressive symptomatology in the general population. Originally, the CES-D had 20 items, but this was revised to 10 items by Andresen et al. [12]. The CES-D 10 uses a four-point system to grade the frequency of symptoms in a recent week. Each item describes a specific behavioural manifestation of depression. Scores for each item can range from 0 to 3, and the total score ranges from 0 to 30. Total scores were defined as raw scores. Women with raw scores ≥10 were considered to have depression. Subjects were divided into two groups: women with depression and women without depression (control group).

The BCI consists of two items with 14 coping strategies that people might use when faced with difficulties or stressful events. These are: (i) problem-focused coping (three subscales: active coping, planning and use of instrumental support); (ii) emotional-focused coping (three subscales: use of emotional support, positive reframing and religion); (iii) adaptive coping (two subscales: acceptance and humour); and (iv) maladaptive coping (six subscales: venting, behavioural disengagement, self-distraction, self-blame, substance use and denial). Participants rated each of the 28 items from 1 ('I usually don't do this at all') to 4 ('I usually do this a lot'). Each coping strategy had a total score ranging from 2 to 8.

The following data were recorded for each patient: age, cause of infertility, duration of infertility, duration of marriage, education, monthly family income and number of oocytes retrieved. Serum follicle-stimulating hormone (FSH) and oestradiol (E_2) on the second day of the menstrual cycle (basal), and serum E_2 on the day of human chorionic gonadotropin administration (defined as peak E_2) were measured.

Data were analyzed using Statistical Package for the Social Sciences Version 13.0 (IBM, Armonk, NY, USA). Frequencies and rates were analyzed using *t*-test, Chi-squared test and Pearson's correlation coefficient. Relationships between continuous and binary explanatory variables and BCI scores were assessed using stepwise multiple regression analysis.

Results

Sixty-five of the 288 women in this study were found to have depression (detection rate 22.6%). The mean age of women with depression [33.3 (SD 3.8) years] was higher compared with the mean age of women in the control group [31.5 (SD 4.7) years] ($p < 0.01$), while body mass index was similar in the two groups [21.65 (SD 3.06) and 21.53 (SD 2.94) kg/m^2 respectively]. Depression was found to be significantly associated with monthly family income and duration of marriage, but education level was not associated with depression. The rate of depression was much higher in women with a monthly family income ≤3000 CNY and women who had been married for >8 years. In addition, patients who had been infertile for >6 years were significantly more likely to have depression. However, a history of previous IVF cycles and cause of infertility were not associated with depression (Table 1).

The main coping strategies used by the subjects were active coping, planning, acceptance, self-distraction and positive reframing (Table 2). Scores for positive reframing, humour and use of emotional support were lower in women with depression compared with the control group, but the score for behavioural disengagement was significantly higher among the control group ($p < 0.01$).

Basal FSH, peak E_2 and oocyte number did not differ between women with depression and the control group, while basal E_2 was significantly higher in the control group ($p < 0.01$) (Table 3).

Multiple logistic regression analysis was performed, using depressive symptoms as the dependent variable and 27 factors as independent variables, including demographic characteristics, infertility factors, factors of IVF treatment and 14 strategies. The main factors that were associated with depression were monthly family income, cause of infertility, basal FSH and E_2, peak E_2, oocyte number and three coping strategies (denial, humour and use of instrumental support). The risk of depression among women with monthly family income ≤3000 CNY was 14-fold higher compared with women with monthly family income >3000 CNY. Additionally, the incidence of depression caused by men compared with the incidence of depression caused by other

Table 1
Relationships between general characteristics and depression.

	Women with depression (n = 65) % (n)	Control group (n = 223) % (n)	p
Education			
Not formally educated	4.6 (3)	5.8 (13)	0.349
Junior middle school	60.0 (39)	49.8 (111)	
College	35.4 (23)	44.4 (99)	
Monthly family income (CNY)			
≤3000	73.8 (48)	58.7 (131)	0.027
>3000	26.2 (17)	41.3 (92)	
Duration of marriage (years)			
≤8	56.9 (37)	77.6 (173)	0.001
>8	43.1 (28)	22.4 (50)	
Primary infertility	73.8 (48)	53.8 (120)	0.004
Second infertility	26.2 (17)	46.2 (103)	
Duration of infertility (years)			
≤6	55.4 (36)	74.9 (167)	0.002
>6	44.6 (29)	25.1 (56)	
Previous IVF cycles			
0	75.4 (49)	79.8 (178)	0.503
≥1	24.6 (16)	20.2 (45)	
Cause of infertility			
Male factor	29.2 (19)	24.7 (55)	0.458
Non-male factor	70.8 (46)	75.3 (168)	

IVF, in-vitro fertilization.

Table 2
Relationship between depression and coping strategies.

	Women with depression (n = 65) mean (SD)	Control group (n = 223) mean (SD)	t	p
Active coping	4.52 (1.397)	4.69 (1.44)	0.836	0.404
Planning	4.71 (1.39)	4.85 (1.44)	0.712	0.477
Positive reframing	4.23 (0.72)	4.87 (1.37)	3.584	0.000
Acceptance	4.60 (1.59)	4.84 (1.24)	1.297	0.196
Humour	3.78 (0.76)	4.39 (1.17)	3.947	0.000
Religion	3.68 (1.49)	3.55 (1.27)	−0.697	0.486
Use of emotional support	3.58 (0.86)	4.00 (1.15)	2.663	0.008
Use of instrumental support	4.11 (1.17)	4.50 (1.12)	2.418	0.016
Self-distraction	4.37 (1.04)	4.50 (1.23)	0.820	0.413
Denial	3.35 (0.93)	3.32 (1.04)	−0.217	0.828
Venting	3.98 (1.32)	4.06 (1.14)	0.441	0.659
Substance use	2.00 (0.00)	2.00 (0.00)	–	–
Behavioural disengagement	3.65 (0.91)	3.35 (1.16)	−2.182	0.032
Self-blame	3.69 (1.10)	3.80 (1.12)	0.728	0.467

SD, standard deviation.