A Comparison of Psychological Functioning in Couples Undergoing Frozen–Thawed Embryo Replacement in Various Stages of Treatment Using the Mean Affect Adjective Check List (MAACL)

W. A. Ismail,¹ M. Q. Menezes,² C. W. Martin,² and K. J. Thong^{1,3}

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Purpose: The objectives were to identify the stage(s) of frozen embryo replacement cycle where the couples are most vulnerable to psychological dysfunction. Assessment was performed by using the Mean Affect Adjective Check-List (MAACL).

Methods: Thirty couples completed the MAACL questionnaire at the following stages: (a) pretreatment (visit 1), (b) before embryo transfer (visit 2), and (c) before pregnancy test (visit 3). Each partner had to complete a separate questionnaire set.

Results: For both partners, the depression score for visit 3 was significantly higher and the sensation seeking and positive affect scores were significantly lower than the corresponding scores for earlier visits. Anxiety scores were similar for all visits. For men, the hostility scores were significantly higher between visits 1 and 2 while in women the same was reported between visits 3 and 2.

Conclusions: Psychological counselling should be targeted at couples especially after embryo transfer. MAACL is a useful method for measuring psychological dysfunction in these couples.

KEY WORDS: Anxiety; depression; frozen–thawed embryo replacement; Mean Affect Adjective Check List (MAACL); psychological stress.

INTRODUCTION

The psychological impact of infertility has now been widely reported. It may result in stress on the couple and their relationship and may provoke a crisis-threatening self-image and identity (1). The frequently reported manifestations of psychological disorder among infertile couple are frustration, anger, lowering of self-perception, interpersonal difficulties, anxiety, and depression (2,3). Women

undergoing in vitro fertilization (IVF) may find the experience stressful (4) and couples that embark on IVF treatment are experiencing a major life event that is associated with increased levels of anxiety, depression, and stress (5). Anxiety is often identified as the major psychological morbidity experienced by women during IVF treatment and some couples may experience depression if their treatment was unsuccessful. Psychosocial counselling and therapeutic measures such as anxiety management and teaching the correct stress-coping techniques may significantly reduce psychological morbidity in these patients.

The Mean Affect Adjective Check List (MAACL) has been extensively used, well-validated and shows good sensitivity to transient stressful conditions (6). In addition, it assesses not only anxiety but also other aspects of psychological well-being in one

¹ Assisted Conception Programme, Edinburgh Fertility & Reproductive Endocrine Centre (EFREC), Royal Infirmary of Edinburgh, Little France, EH 16 4SU, United Kingdom.

² Division of Obstetrics and Gynaecology, Royal Infirmary of Edinburgh, Little France, EH16 4SU, United Kingdom.

³ To whom correspondence should be addressed; e-mail: joothong@hotmail.com.

simple questionnaire. While it has been used to assess psychological stress in many clinical situations such as preoperative anxiety (7) and in cancer patients (8), there is a paucity of published data on its use in the IVF context (9).

This study using MAACL was designed to assess the mood and mental state experienced by the couples undergoing frozen embryo replacement at different stages of their treatment.

MATERIALS AND METHODS

Subjects

The subjects were couples who were accepted for frozen embryo replacement (FER) treatment in the Edinburgh Assisted Conception Programme. Thirty-five couples gave their informed consent to participate in this study between March and September 2002. Each participant was able to complete MAACL questionnaire at three critical time points in the FER treatment cycle as follows: (a) prior to starting treatment, at the visit where a baseline ultrasound scan and/or blood test for luteinizing hormone (LH) and oestradiol is performed (visit 1); (b) before embryo transfer (visit 2); and (c) just before pregnancy test (visit 3). Thirty couples completed the questionnaire at the three specific time points. There were five cycle cancellations; two cases were cancelled because of failure of these women to respond to hormonal treatment in their artificial cycles while the other three cases were cancelled as the embryos did not survive the freezing–thawing process.

Methods

In women with regular ovulatory cycles, blood tests for measuring luteinizing hormone and oestradiol levels were taken from day 3, 10, and usually daily thereafter until there was evidence suggestive of ovulation. A maximum of two frozen–thawed embryos was transferred.

Women with irregular cycles were down-regulated using a GnRH agonist (Nafarelin, Synarel, Pharmacia, UK). This was followed by oral hormonal replacement therapy for 15 days as described by Marcus and Brinsden (10). Ultrasound assessment of the endometrium was carried out on day 15 and embryo transfer was carried out on day 17 when the endometrial thickness was ≥ 8 mm. Treatment cycles were cancelled if there was no detectable LH surge in natural

cycles or if the endometrial thickness was < 6 mm in artificial cycles. Pregnancy test (serum human chorionic gonadotrophin) was carried out 2 weeks after embryo transfer to confirm whether the treatment was successful.

At the specific times, the psychological functioning of the couples was assessed with a self-administered MAACL questionnaire, described by Zuckerman and Lubin (11). The participants were given adequate time to complete the check-list but none took longer than 10 min. MAACL contains a list of 132 words and the participants checked adjectives that best described their mental/emotional state at that moment. The adjectives are grouped into five categories, namely, sensation seeking, positive affect, hostility, depression, and anxiety, but are presented in random order. A numerical score for each category is obtained with the higher scores indicating greater levels of symptomatology in those categories.

Statistical Analysis

The data obtained from the questionnaires were collected in spreadsheets, scored using the Standard (*T*) Scores for MAACL, and analyzed using the statistical package Statview. The data was normally distributed and the paired Student's *t* test was carried out comparing MAACL scores for the three visits. Statistical significance was taken when *p* value was < 0.05 . Data is presented as mean $\pm$ standard error of mean (SEM).

RESULTS

The mean MAACL scores and the detailed results of Student's *t* test are presented in Fig. 1(A) (men group), 1(B) (women group), and Table I, respectively.

Figure 1(A) showed a significant reduction in sensation seeking scores when visit 3 is compared to visit 1 ($p = 0.001$) and visit 2 ($p = 0.03$). The positive affect scores were significantly lower for visit 3 than for visit 1 ($p = 0.01$) and visit 2 ($p = 0.03$). The mean depression score for visit 3 was significantly higher ($p < 0.001$) than corresponding scores for either visit 1 or 2. Apart from the significant ($p < 0.05$) drop in hostility scores between visits 1 and 2, there was no significant difference between visits 2 and 3. There was no significant difference in the mean anxiety scores between the three visits.

Figure 1(B) showed that sensation seeking and positive affect mean scores were significantly lower

Fig. 1. (A) (men's group): MAACL (Mean Affect Adjective Check List) state mean scores at visit 1 (before treatment), visit 2 (before embryo transfer), and visit 3 (before pregnancy test). Statistical comparison between visits 1 and 3 is indicated by "a" and between visits 2 and 3 by "b". Statistically significant difference ($p < 0.05$) is indicated by "*" while highly significant difference ($p < 0.001$) is indicated by "**", using paired Student's t test. (B) (women's group): MAACL (Mean Affect Adjective Check List) state mean scores at visit 1 (before treatment), visit 2 (before embryo transfer), and visit 3 (before pregnancy test). Statistical comparison between visits 1 and 3 is indicated by "a" and between visits 2 and 3 by "b". Statistically significant difference ($p < 0.05$) is indicated by "*" while highly significant difference ($p < 0.001$) is indicated by "**", using paired Student's t test.

Table I. MAACL Mean Scores $\pm$ (SEM) and Significance for the Five Functions of Mood in Both Groups

Visits Mean scores	Sensation seeking		Positive affect		Hostility		Depression		Anxiety	
	M	F	M	F	M	F	M	F	M	F
V1	25.2 $\pm$ 1.4	25.1 $\pm$ 1.6	42.8 $\pm$ 2	40.8 $\pm$ 1.8	49.4 $\pm$ 2.1	51.3 $\pm$ 1.8	54.6 $\pm$ 2	51.7 $\pm$ 1.9	68.7 $\pm$ 4.2	63 $\pm$ 2.9
V2	22.7 $\pm$ 1.3	22.2 $\pm$ 1.7	44.1 $\pm$ 1.7	43.4 $\pm$ 1.8	44.4 $\pm$ 1.6	48.7 $\pm$ 1.6	50.3 $\pm$ 2.3	50.6 $\pm$ 2	72.2 $\pm$ 4.3	67.4 $\pm$ 2.8
V3	19.3 $\pm$ 0.9	19.8 $\pm$ 0.9	39.8 $\pm$ 1.3	37.2 $\pm$ 1.5	46.5 $\pm$ 1.7	54.2 $\pm$ 1.9	61.8 $\pm$ 3.8	61.9 $\pm$ 3.4	67.1 $\pm$ 3.4	70.7 $\pm$ 3.9
<i>P</i> values										
V1 vs. V2	0.14	0.16	0.78	0.66	0.046*	0.13	0.54	0.66	0.22	0.22
V2 vs. V3	0.03*	0.28	0.03*	0.004*	0.4	0.02*	0.001**	0.004*	0.06	0.4
V1 vs. V3	0.001**	0.004*	0.01*	0.05*	0.35	0.2	0.001**	0.012*	0.45	0.06

* $p < 0.05$; ** $p < 0.001$.

($p \leq 0.05$) for visit 3 than for earlier visits. In contrast, the mean depression score for visit 3 was significantly higher ($p \leq 0.05$) than corresponding scores for other visits. There was a significantly higher hostility score in visit 3 than in visit 2 ($p = 0.02$). There were no significant differences in the mean anxiety scores between the three visits in these couples.

DISCUSSION

Our results show that couples undergoing FER treatment experience high levels of psychological stress at certain stages of treatment. There was a significant increase in depression scores and significant decrease in sensation seeking and positive affect scores following embryo transfer and before the result of the pregnancy test is available for both men and women. Women had significantly higher hostility scores following embryo transfer. These findings are congruent with the observations reported in a previous study in our unit in women undergoing fresh IVF treatment cycles (9) and several other studies that reported that couples undergoing IVF treatment ranked the period spent waiting for the outcome of treatment and a negative pregnancy result as the most stressful event (5,9,12,13).

Evaluation of the psychological functioning in infertile couples before embarking on treatment has been reported. In a study of 300 couples entering an IVF program (14), it was found that couples did not differ from normative data with respect to overall life satisfaction, overall well-being, and depression. Women did not differ from normative data on state and trait anxiety, whereas the men were even significantly less anxious than the norm. Interpretation of the findings was limited by several factors. The most important factor was that respondents reported bias toward socially acceptable responses. Newton *et al.* (15) studied the emotional status of couples entering an IVF program (947 women and 899 male partners). In comparison to their male partners, women experienced significantly higher levels of anxiety, trait anxiety, and depression. Women reported more open expression of feelings and greater involvement in social and/or recreational activities, which are, according to the authors, congruent with suggestions that women are more likely than men to seek emotional and social support. For men, their greater orientation toward achievement is thought to be consistent with the suggestion that men cope with infertility by greater involvement in work-related activities. This

study suggested that men and women tend to cope rather differently with infertility and subsequent treatment.

Although this study, using MAACL, has demonstrated significantly higher depression scores in couples undergoing FER, we are not certain if these couples have clinical depression. Similarly, the significant sensation seeking and positive affect scores reported may be transient and may have no long-term sequelae for them.

Connolly *et al.* (16) employed the IVF Stress Inventory and found that women ranked the following in their order of perceived stressfulness: waiting for the outcome of embryo transfer, waiting for confirmation if fertilization had occurred and lastly, how many oocytes were retrieved. Interestingly, Merari *et al.* (17), using the State Trait Anxiety Inventory, reported that women experienced the highest level of anxiety just before oocyte retrieval and the lowest anxiety scores were at embryo transfer. The authors agreed, however, that given the small sample size, their results could be accounted for by other variables. Johnston *et al.* (18) demonstrated that at oocyte retrieval and embryo transfer, women experienced anxiety levels similar to those having major surgery.

In our study, both partners had anxiety scores before embryo transfer, which were not statistically different from those before pregnancy test. Although women showed tendency for higher anxiety scores, this did not reach statistical significance. These findings were comparable to those obtained in fresh IVF cycle patients (9) and female surgical patients in the immediate preoperative period (7). The lack of significant difference in anxiety levels throughout treatment in our study was interesting. This did not mean that patients were not anxious but they did not get any more or less anxious to a significant level at any stage. The likely explanations to our finding could be the women's previous experience of IVF treatment cycles: they were already familiar with the procedure; FER was less invasive, had more realistic expectations, and may have developed coping strategies. While it is a common practice to offer psychosocial counselling and therapy to women in the pretreatment phase of IVF, these services may not be readily available during the treatment cycle itself. Demyttenaere *et al.* (19) have suggested that a significant number of patients would have considered such services if it had been offered during treatment. Moreover, couples may feel "reassured" to know that counselling services are available whenever needed, even if they do not use them (20).

In conclusion, our study suggested that the period leading up to the pregnancy test is the most vulnerable and psychological support should be readily available to couples undergoing frozen embryo replacement. MAACL is a reliable questionnaire to assess psychological stress and can be used simultaneously to assess other aspects of psychological well-being. Further studies are required to confirm our findings.

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