Abstract

The aim of this study was to study the emotional impact of in-vitro fertilization (IVF) and any possible influence due to the type of diagnosis, duration of infertility, number of cycles and type of responses to treatment. The study was carried out on 200 patients admitted to hospital for the final stages of IVF (oocyte retrieval and embryo transfer). The psychological measures taken into consideration were: state and trait anxiety levels (Stait–Trait Anxiety), unconscious and symptomatic anxiety, perception of self and of others (EWI). Monitoring of anxiety levels during hospitalization highlighted significant differences with respect to the state anxiety values ($P < 0.01$) and general anxiety ($P < 0.05$), but not with respect to trait anxiety. The level of state anxiety of women with a diagnosis of infertility was significantly lower ($P < 0.05$). Women who have experienced infertility of medium to long duration presented a significantly lower state anxiety value ($P < 0.01$). The failure of oocyte fertilization determines a significant increase in state anxiety level ($P < 0.01$). There were no significant differences in anxiety values with respect to the cycle number. Perceptive functioning was normal.

Key words
- assisted reproductive technology
- infertility, in-vitro fertilization
- psychological distress
- self-image

Previous Section

Introduction

The psychological impact of infertility has now been widely confirmed. It implies great stress on both members of the couple and on their relationship and also provokes a crisis that threatens self-image and identity (Möller and Fällström, 1991). The most frequently reported manifestations of psychological disorder are: frustration, anger, lowering of self-perception, interpersonal difficulties, anxiety and depression (Mahlstedt, 1985; Edelmann and Connolly, 1986; Berg and Wilson, 1990; Beaurepaire, 1994). It has been widely found that in-vitro fertilization (IVF) is also a particularly stressful experience, especially for the woman. This treatment is long and tiring, it disturbs marital sexuality and involves physical suffering which is linked, interdependently, to emotional disorders. (Kopitzke et al., 1991). Nevertheless, research into infertility suggests that the diagnosis of infertility, IVF and possible failure do not provoke the same threat to all individuals: there are numerous personal and contextual variables that may affect the psychological response to infertility.

Many studies have aimed to identify the emotional state of the patients during IVF; all recognize that these procedures are highly stressful. Irrespective of the final outcome, women undergoing IVF define it stressful, difficult and, at times, 'an ordeal', yet they choose to pursue this kind of treatment in the hope of having a child that is genetically their own. (Auhagen-Stephanos, 1993; Chatel, 1995; Chatel et al., 1996). According to Mahlstedt et al. IVF causes patients to experience a wide range of feelings in a short space of time (Mahlstedt et al., 1987). Of the 94 patients in our sample, the majority had experienced frustration, depression, hopelessness and anger. In a longitudinal study (Slade et al., 1997), which was carried out on 144 couples, at intake for IVF the women presented a high level of anxiety and proved to be more stressed than their partners.

Although women undergoing IVF admit they feel psychological stress, the intensity of this reaction is not homogeneous; it has been observed that for many infertile patients the term stress or depression indicates an emotional reaction to the uncertainty of the future, fears concerning medical intervention and their own reproductive ability (Downey et al., 1989). Nevertheless, there is a small
percentage of women who use the term depression to indicate a much more serious psychological state.

In an attempt to identify intersubjective causes (Lazarus and Folkamm, 1984) it was found that different modalities of evaluating the event (infertility, IVF, failure) and the different personal and environmental resources available provoked different responses to stress. Some maintain that the emotional response depends on the means of coping (Edelmann et al., 1994). In this study, the authors found a better response of adjustment to IVF in couples who, at the same time, had accepted their own condition to some extent. Cook maintains that the emotional functioning of women undergoing IVF is linked to the sexual role (Cook, 1993). Of the 58 women he studied, those with a more traditional feminine sexual role proved to be more anxious compared with women with a masculine type of sexual role.

Other studies focused on which aspects of IVF treatment have caused greater distress: researchers concentrated on the duration of treatment, the condition of uncertainty characterizing IVF and failure. A correlation has been noted between stress and duration of infertility treatment (Berg and Wilson, 1991). In the sample they studied, stress was moderately high during the first year of treatment, less in the second year, returning to normal levels and notably increased from the third year onwards. Boivin et al. showed that the uncertainty of the treatment, i.e. waiting to discover whether each stage of IVF was successful or not, determined the most significant emotional changes (Boivin et al., 1998): both partners experience, ambivalent feelings or great stress together with hope and intimacy. These feelings were a little more notable in the woman.

Many studies confirm that a considerable amount of stress is experienced after IVF failure. In a study carried out on 59 couples during and after IVF treatment (Leiblum et al., 1987), it was observed that sadness, anger and depression were all common responses to failure; such reactions were significantly higher in women than in men and were still present after 5 weeks. Baram et al. found in their study that IVF failure was associated with feelings of loss, rage, anxiety, guilt, helplessness and hopelessness and that reaction to suffering in many of the patients went through the following stages: anger, despair, detachment, reorganization and acceptance (Baram et al., 1988). Furthermore, the authors report that, after failure of the treatment, 13% of the 47 women in the sample (but no man) had ideas of committing suicide. It is claimed that IVF failure is associated with a deterioration in the emotional state (Slade et al., 1997): in their longitudinal study, after 6 months from the end of treatment, the women who were unsuccessful had a significantly higher level of emotional stress, poor marital adjustment and high dissatisfaction compared to women who were pregnant.

Suffering is greater after failure at the first IVF cycle and this reaction is closely linked to the degree of attachment to the expected pregnancy (Greenfeld et al., 1988). Newthon et al. also observed the strong emotional impact at the first cycle of treatment (Newthon et al., 1990): 25% of the sample they studied presented a greater situational anxiety and depressive symptoms 3 weeks after failure; the authors also noted that a predisposition to anxiety and the presence of depressive symptoms before treatment were important predictors of emotional response.

Thiering et al. (1993) showed that there was a certain correlation between the emotional state during treatment and the final outcome (Thiering et al., 1993): in their sample, the depressed women had a lower pregnancy rate than non-depressed women; moreover, the women repeating the IVF cycle were more depressed than those at their first cycle. No significant differences between anxiety levels emerged in their study.

Regarding the psychological problems of IVF, we focused our attention on the psychological condition of the infertile women during the final stages of this treatment, i.e. the period between oocyte retrieval and embryo transfer, stages that are carried out in our IVF centre when the patients are hospitalized.

Knowing that hospitalization is, in itself, a great source of stress (Gammon, 1998), the main aim of
this study was to monitor the level of anxiety and identify the perceptive functioning of women admitted to hospital for IVF. Furthermore, we wanted to see whether the anxiety state underwent any variations during hospitalization, whether the type of infertility, its duration and number of IVF cycles affected the experience in hospital and whether the final outcome of IVF could be related to the psychological condition of the woman during the final stages of IVF. Specifically, the psychological areas studied were: state and trait anxiety, unconscious and symptomatic anxiety, perception of the self and others.

Materials and methods

Design

In our research we tried to focus on various aspects of the distress observed. As far as anxiety was concerned, it was our intention to identify the extent of anxiety, both as a response to a stressing situation and as a personality trait, verifying the presence of manifest anxiety and latent anxiety. Since hospitalization itself is usually a source of anxiety for the patient, we turned our attention mainly to possible variations during the 3 days in hospital. We also studied the perceptive functioning of the women, their interior world and their attitudes towards themselves and others.

For a more detailed analysis of the phenomena, we considered five variables, i.e. the day of hospitalization, (day), the type of infertility diagnosis (diagnosis); the time elapsed since diagnosis (year-diagnosis); the number of IVF cycles (cycle); and the type of outcome to IVF (outcome). We also wanted to verify any possible interaction with the psychological variables taken into consideration.

After echographic and hormonal monitoring, which takes place in the outpatients department, our IVF programme requires patients to be admitted to hospital for 3 days. On the first day (1st day) oocyte retrieval is performed; on the second day the patients await the results of the oocyte IVF; on the third day the results are given and, in the case of successful IVF, the embryo is transferred to the uterus or to the Fallopian tube. In the case of non-fertilization, the patient is sent home. Given that the patient is admitted to hospital, the following diagnostic instruments were administered. 1st day of hospitalization (before oocyte retrieval): STAI-Y, ASQ; 2nd day of hospitalization: Stait–Trait Anxiety Inventory, Y form (STAI-Y), IPAT Anxiety Scale Questionnaire (ASQ), Experiential World Inventory (EWI); 3rd day of hospitalization (after the results of IVF): STAI-Y, ASQ. The day variable was applied to the whole sample to examine the differences in the values of the different measures of anxiety.

Regarding the other four variables, our sample was divided into subgroups, as follows: for diagnosis, four subgroups: (i) male sterility, (ii) female sterility, (iii) unaccountable sterility and (iv) sterility of the couple; for year-diagnosis, three subgroups: (i) women who had been aware of the diagnosis for a period of <3 years, (ii) women who had been aware of the diagnosis for 4–6 years and (iii) women who had known of the diagnosis for ≥7; for cycle, three subgroups: (i) women who were undergoing their first IVF cycle, (ii) women who were undergoing their second or third attempt and (iii) women who were at their fourth or more attempt; for outcome, three subgroups: (i) women who had had oocyte fertilization without embryo implantation, (ii) women who had not obtained oocyte fertilization and (iii) women who had had both oocyte fertilization and embryo implantation.

Measures

The instruments chosen for a psychological investigation were the following:
State–Trait Anxiety Inventory, Y form (STAI-Y)

This inventory measures state anxiety (situational type emotional response) and trait anxiety (individual predisposition towards anxiety). The reliability coefficient (Cronbach's Alpha), referring to the Italian adult female normative sample, is 0.91 for state and 0.90 for trait (Spielberger, 1989);

IPAT Anxiety Scale Questionnaire (ASQ)

This estimates the total level of anxiety by identifying and distinguishing unconscious or latent anxiety from manifest or symptomatic anxiety. The reliability coefficient (retest after a week) of the score of total anxiety is 0.93, of latent anxiety 0.89 and of manifest anxiety 0.82; the validity coefficient of the whole score is 0.90 (Krug et al., 1978).

Experiential World Inventory (EWI)

This is a psychometric diagnostic instrument from the category of personality inventories, for the study of subjective experience, and explores events and the perception of the world. It comprises 400 ‘true’ or ‘false’ statements; it is divided into two parts, each containing 200 items, which may be used as equivalent forms. EWI identifies how the subject places herself with respect to the eight Main Scales (1. Sensory perception, 2. Perception of time, 3. Perception of the body, 4. Perception of the self, 5. Perception of others, 6. Thought, 7. Dysphoria, 8. Drive) and to four additional Scales (9. Hyperaesthesia, 10. Hypoaesthesia, 11. Euphoria, 12. Anxiety). The reliability coefficients (retested after 5 months) range from 0.59 (Scale 7. Dysphoria) to 0.93 (Scale 3. Perception of the body) The original aim of the EWI was to discover how the patient perceives her environment, how she sees herself in relation to this environment, and how she perceives and experiences the changes that occur in her. In our study, it was used to understand the perceptive functioning of those women undergoing IVF, but also to understand their interior world and their attitudes towards themselves and their environment (Calvi et al., 1978; Bonneau and El-Meligi, 1981)

At intake, the psychologist gave each patient an envelope containing all the questionnaires. On receiving the envelope, the patient was given instructions on how and when to fill out the forms, and how to return the envelope.

Subjects

The study was carried out on a sample of 200 Italian women who had had access consecutively to the oocyte retrieval stage in the period from November 1, 1996 to January 10, 1997 at the Centre of Assisted Reproductive Technology, Department of Obstetrics and Gynaecology, Azienda Ospedale S.Maria Nuova, Reggio Emilia, Italy. Not all the women had correctly filled out the questionnaires; the poor responders behaved as reported in Table I.

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Table I.

Number and percentages of the subjects who did not complete the questionnaires

Their mean age was 33.8 years (range 25–44); 108 women (54%) had completed upper secondary school education, seven (3.5%) primary, 57 (28.5%) lower middle school, 28 (14%) university; 149 (74.5%) had a full-time job and 51 (25%) were housewives. All were married and the average duration of their marriage was 8.9 years (range 1–23).

A total of 192 women (96%) manifested a condition of primary infertility and had been aware of it, on average, for 6.1 years (range 1–22). For the 200 women in our study, the indication for IVF was:
80 (40%) male infertility, 65 (32.5%) female infertility, 30 (15%) couple infertility and 25 (12.5%) unaccountable infertility. Thirty-nine women (19.5%) had been aware of their infertility condition for a relatively short time (≤3 years), 75 (37.5%) for an average length of time (from 4 to 6 years) and 86 (43%) for quite a long time (≥7 years).

A total of 109 women (54.8%) had undergone oocyte retrieval for IVF–uterine embryo transfer (UET), 55 (27.5%) for intracytoplasmic sperm injection (ICSI)–UET, 25 (12.5%) ICSI–tubal embryo transfer (TET) and 11 (5.5%) for IVF–TET; 87 women (43.5%) were at their first cycle of IVF, 87 (43.5%) at their second or third and 26 (13%) were repeating it for the fourth or more time (range 1–9).

In 38 cases (19%) IVF had not been successful, in 128 cases (64%) had had an embryo transfer but had not become pregnant and 34 (17%) had become pregnant.

**Statistical analysis**

The data were analysed both descriptively and inferentially, with the help of a statistical programme SPSS. In order to evaluate the influence of the independent variables we considered on the outcomes, we referred to the analysis of variance (ANOVA). For the other instruments, such as post-hoc analysis for the comparisons of the couples, Student's *t* and Student–Newman–Keuls tests were used. *P* < 0.05 was considered significant.

**Results**

**Anxiety**

**State–Trait Anxiety Inventory (Y Form)**

In the women in our sample, the state anxiety underwent significant variations during the 3 days of hospitalization. Before carrying out oocyte retrieval, the women presented a slightly higher anxiety state value than that of the Italian normative sample (STAI–State: mean ± SD 39.9 ± 11) (Spielberger, 1989). This value was significantly reduced (*P* = 0.0003) on the second day and significantly higher on the third, after the outcome of fertilization (*P* = 0.0003). The anxiety state values on the first and third days of hospitalization were not significantly different (Table II).

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**Table II.**

Number of subjects, total means ± SD of State–Trait Anxiety Inventory (STAI) score in the 3 days of hospitalization

The anxiety trait remained constant throughout the 3 days; its value was slightly lower than that of the Italian normative sample (STAI–Trait: mean ± SD 41.2 ± 9.6) (Spielberger, 1989) (Table II).

In the subgroups of the diagnosis (D) variable, there were some significant differences in the state anxiety values, in relation to the day of hospitalization: before oocyte retrieval, the women of the D-3 subgroup presented a significantly lower level of state anxiety than those of the D-4 subgroup (*P* = 0.03); on the second day of hospitalization, the women of the D-3 subgroup presented a significantly lower level of state anxiety than those of the D-1 (*P* = 0.04) and of the D-4 subgroups (*P* = 0.01) (Table III).
Table III.
Means ± SD of the State–Trait Anxiety Inventory (STAI) scores in the 3 days of hospitalization for the diagnosis subgroups

The reduction in the state anxiety level on the second day of hospitalization is significant for the D-1 ($P = 0.006$) and D-2 ($P = 0.001$) subgroups; the increase in the state anxiety level on the third day was significant only for the D-1 ($P = 0.009$) subgroup; the state anxiety values of the first day were not significantly different from those of the third day for all four subgroups (Table III).

Among the trait anxiety values, there appeared to be no significant difference in the comparisons made between the diagnosis and day variables (Table III).

In the subgroups of the year-diagnosis (YD) variable, for each day of hospitalization, the only significant difference was found between anxiety state values on the first day: the women who had known of their infertility problem for 3–6 years faced oocyte retrieval with a significantly higher level of state anxiety ($P = 0.01$) compared with the group of women who had been aware of their infertility problem for >7 years (Table IV).

Table IV.
Means ± SD of the State–Trait Anxiety Inventory (STAI) scores in the 3 days of hospitalization for the year-diagnosis subgroups

The reduction of the state anxiety on the second day of hospitalization was significant for all the year-diagnosis subgroups (YD-1: $P = 0.04$; YD-2: $P = 0.0001$; YD-3: $P = 0.04$). The increase in the state anxiety values on the third day was significant only for the second subgroup (YD-2: $P = 0.03$).

In each subgroup, the differences in the state anxiety values between the first and third days were not significant (Table IV).

Among the trait anxiety values, there were no significant differences in the cross-checking between the year-diagnosis and day variables (Table IV).

In the subgroups of the cycle (C) variable, for each day of hospitalization, there were no significant differences in the state anxiety values.

The variations in the state anxiety values for each subgroup presented some significant differences in the 3 days of hospitalization. In the C-1 subgroup the anxiety state was significantly reduced on the second day of hospitalization ($P = 0.001$). However, the differences in the state anxiety values present between the second and third days and between the first and third were not significant. In the C-2 subgroup, the state anxiety is significantly lower on the second day ($P = 0.002$) and significantly higher on the third ($P = 0.02$); the difference in the state anxiety values between the first and third days of hospitalization is not significant. In the C-3 subgroup, the variations in the state anxiety values are not significant either. In each subgroup, the differences in the state anxiety values between the first and third days are not significant (Table V).
Table V.
Means ± SD of the State–Trait Anxiety Inventory (STAI) scores in the 3 days of hospitalization for the cycle subgroups

Among the trait anxiety values, there is a significant difference in the cross-checking between the cycle and day variables (Table V).

In the subgroups of the outcome (O) variable, the differences in the state anxiety values on the first day of hospitalization were not significant. On the second day, the state anxiety value of the O-3 subgroup was significantly higher than the value of the O-2 subgroup ($P = 0.04$). On the third day, the state anxiety value of the O-3 subgroup was higher than the Italian normative sample and significantly higher than the value of the O-2 subgroup ($P = 0.004$) (Table VI).

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Table VI.
Total means ± SD of the State–Trait Anxiety Inventory (STAI) scores values in the 3 days of hospitalization for the outcome subgroups

The reduction in state anxiety on the second day of hospitalization was significant for all the subgroups of the outcome variable (O-1: $P = 0.0005$; O-2: $P = 0.03$; O-3: $P = 0.02$). The variation in state anxiety between the second and third days was significant only for the O-3 subgroup ($P = 0.0001$). The difference in the state anxiety values between the first and third days was significant only for the O-1 subgroup ($P = 0.02$) (Table VI).

Among the trait anxiety values, there were no significant differences in the cross-checking between the outcome and day variables (Table VI).

IPAT Anxiety Scale
The general anxiety of the women in our sample was slightly higher than that of the Italian normative sample (ASQ-IPAT: mean ± SD 28.6–11.3) (Krug et al., 1978). Furthermore, manifest anxiety proved to be quantitatively similar to latent anxiety (Table VII).

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Table VII.
Number of subjects, total means ± SD of the Anxiety Scale Questionnaire (ASQ) values in the 3 days of hospitalization

The variations in the latent anxiety values (unconscious) and manifest anxiety (symptomatic), which were present during the 3 days of hospitalization, were not significant, whereas the reduction in the general anxiety value, noted from the first to third day of hospitalization, was significant ($P = 0.03$) (Table VII).

No significant differences were noted in the cross-checking of the variations in the general anxiety values in relation to the variables taken into consideration (day–cycle–year-diagnosis–outcome).

Experiential World Inventory (EWI)
The average EWI profile of the women in our sample did not reveal any anomaly in perceptive functioning.
An analysis of the single Main Scales revealed a capacity in the women to remain firmly rooted to reality [Scale 1.S: 3.2 ± 11.4 (mean ± SD)] and to concentrate on the present, showing a free attitude to life (Scale 2.T: 12.0 ± 5.09); there were no signs of hypochondria or anxiety regarding their own physical integrity (Scale 3.C: 6.4 ± 6.3), there did not appear to be any weaknesses in the confines of the self and in autonomy (Scale 4. Self: 7.8 ± 5.8) or problems of social adjustment and communication (Scale 5.A: 8.4 ± 5.5); intellectual efficiency (memory, concentration, conception) did not appear to be lacking (Scale 6.P: 7.1 ± 5.3); there were no depressing thoughts but rather hopes (Scale 7.D: 4.1 ± 5.3); the women managed to control themselves and their excitability (Scale 8.Pl: 5.4 ± 3.4).

An evaluation of the Additional Scales show that the women presented a lower sensorial acuteness [Scale 9. Ir: 7.1 ± 5.2 (mean ± SD)], they firmly held on to reality (vigil conscience) in order to keep on functioning (Scale 10.Io: 2.7 ± 3.3), they maintained a sufficient balance between excessive optimism and pessimism (Scale 11.E: 15.4 ± 3.2) and did not feel any discomfort or insecurity facing the unknown (Scale 12.A: 11.7 ± 6.2).

A comparison between the mean values of the subgroups of the variables considered (day–cycle–year-diagnosis–outcome) did not reveal any significant differences.

Discussion

The purpose of our study was to analyse the conscious feelings experienced during IVF treatment in an Italian sample. Our results confirm that women adjust discreetly to IVF (Edelmann et al., 1994). However, it has also been confirmed that IVF is a highly stressful experience (Morse and Dennerstein, 1985; Kopitske et al., 1991; Auhagen-Stephanos, 1993; Chatel, 1995; Chatel et al., 1996) and that emotional involvement is high (Freeman et al., 1987; Leiblum et al., 1987; Mahlstedt et al., 1987; Baram et al., 1988; Greenfeld et al., 1988). As Boivin (1998) has already shown, and as seen in our study, stress is particularly noticeable during oocyte retrieval and embryo transfer, but it reaches a significantly high value after failure (Leiblum et al., 1987; Baram et al., 1988; Greenfeld et al., 1988; Slade et al., 1997). We agree with the studies of Thiering et al. (1993) and Slade et al. (1997) that there are no differences between the emotional state of women who have not become pregnant and those who have been unsuccessful: anxiety during hospitalization for IVF does not appear to be predictive with respect to pregnancy.

Nevertheless, this study has some limitations. The main limitation is due to the poor responders; among the questionnaires returned, there were some that had not been filled in (Table I) and we did not contact the women to find out why. However, the observation of the data did not allow us to check whether the majority of poor responders were among the questionnaires to be filled in after the results of fertilization and in the group of women who had had a negative response. The women who did not achieve fertilization but who had filled out the questionnaires, present a high state anxiety value, significantly higher compared to those who were to undergo embryo transfer. It is therefore likely that failure at the fertilization stage reduced motivation in women to take part in the study.

The subdivision of the subgroups into the year-diagnosis and cycle, was arbitrary since we had no references before starting our study. In our experience of psychological support in IVF we had noted that there were some differences in the experiences and attitudes of the women with respect to infertility and the number of failures in IVF. As far as the duration of infertility is concerned, we decided to place into three subgroups those who had known about the diagnosis for a relatively short time, those who had known for an average to long period of time and those who had known for a long time. Regarding the number of the IVF cycle, we decided to separate those who were undergoing IVF treatment for the first time (a new experience, to be discovered), those who were undergoing it for the second or third time (no longer a new experience and with few failures.
experienced) and those who had already experienced at least three failures. The sample we studied was not random but consecutive.

Since we had not planned any follow-up of the women in our study, some important data are missing regarding the feelings of those women who experienced failure after embryo transfer, i.e. they did not become pregnant. Another limitation is that we did not involve the partners of the women who underwent IVF; in this way, we only have a partial view of the problem, referring only to the female experience. In spite of these limitations, the results of this exploratory study on an Italian sample allow us to make some interesting observations.

The total level of anxiety, the equivalence between the values of latent anxiety and symptomatic anxiety (ASQ), the assessment of state and trait anxiety (STAI-Y) coinciding with the mean normal adult population, as well as the EWI profile, exclude the presence of pathological nuclei in the sample we studied.

Anxiety, intended as a personality trait, is within normal values in the women in our sample; it remains stable during the 3 days of hospitalization and does not present any differences between the subgroups of the variables taken into consideration.

There is no difference between the anxiety experienced unconsciously and the anxiety expressed through behaviour, and there are no significant variations during the 3 days of hospitalization. Nevertheless, general anxiety gradually decreases during hospitalization: general anxiety concerning oocyte retrieval is significantly greater with respect to general anxiety concerning embryo transfer.

The anxiety-generating nature of IVF is confirmed. Indeed, a comparison of anxiety levels during the 3 days of hospitalization reveals a more anxious psychological state both before oocyte retrieval and before embryo transfer. In these two moments in IVF treatment, emotional investment is greater and of equal intensity. We share Boivin's view that it is the uncertainty of the outcome that makes these two moments of IVF treatment more stressful.

Among the variables considered, only the number of IVF cycles did not appear to match significantly the anxiety state of the women during hospitalization for IVF. Among the other variables (diagnosis, year-diagnosis and outcome), significant differences were noted in some subgroups.

Women with a diagnosis of unexplained infertility cope with oocyte retrieval in a considerably lesser state of anxiety than those with a diagnosis of infertility of the couple, and face the second day of hospitalization in a considerably lesser state of anxiety than those with a diagnosis of male infertility and of infertility of the couple. It can be postulated that this group of women face the IVF procedure with a lower intensity of state anxiety, since they are not so worried about the outcome (Morse and Dennerstein, 1985). However this needs further investigation.

The women who have known about their infertility condition for an average–long period (4–6 years) face oocyte retrieval with a considerably higher level of state anxiety than the group of women whose sterility condition has lasted longer (≥7 years). In our sample, it seems that a longer duration of infertility, rather than the repetition of the cycles, may help in coping with oocyte retrieval with less tension. These results do not agree with Berg and Wilson's findings (1991). However, we believe that this is due to the different criterion used in subdividing the sample between our study and theirs.

A negative outcome of oocyte fertilization clearly produces a notable state of anxiety (Greenfeld et al., 1988). Interruption of IVF treatment due to failed embryo fertilization appears to bring on greater psychological distress, with respect to oocyte retrieval and embryo transfer. We think that the hope of having a biological child, by means of IVF, allows a woman to adapt herself psychologically to the procedure, despite its invasiveness; on the other hand, failure and consequent crushing of hope places the woman before a reality that is experienced in a more difficult and
disturbing manner than IVF itself. It suggests that in such a condition, a woman may experience an emotional state that involves other psychological measures besides anxiety which, in the present study, have not been considered.

The perceptive functioning of the women in our study appears to be normal. The presence of hope is evident as well as a firm grasp of reality and concentration on the present. Those data suggest that IVF was able to take a central place in their minds when they filled out the questionnaires, but without disturbing their psychological well-being. However, as Masure et al. suggest, we should not underestimate the fact that women may be too much on the defensive when filling out the self-report questionnaires (Masure et al., 1984). For this reason they may present a socially desirable self-image that does not correspond to their actual psychological state.

Other authors (Berg and Wilson, 1990; Arcidiacono, 1994; De Ritis et al., 1994) have already noted the close connection between infertility and the body, claiming that a non-fertile body is experienced as a body that is not normal, does not function, and is not productive or rather violated in its expectations of generativeness. We believe that infertility generates a feeling of inadequacy in the individual, linked with a sense of inferiority of the 'reproductive organ', which also affects the concept of the self. For this very reason, it needs to be overcome. There are subjective differences regarding the choice of ways to overcome a feeling of inferiority; our study sample chose IVF as a means of overcoming their own 'inferiority of organ'. We also think that IVF is usually coped with quite adequately because it means a sort of compensation, a compromise with the inferiority of the reproductive organ. Obviously, the greater the feeling of inadequacy, the greater the urge to overcome it and, consequently, the flow of feelings and emotions that may threaten equilibrium: IVF may become a supercompensation with one's own sense of inferiority and therefore affect personal harmony (Adler, 1933).

If, on the whole, it appears that infertile women recover all their best and most efficient personal resources in order to cope with IVF, it is still also true that the infertility condition in itself, resorting to IVF and failure of the technique undermine, albeit with obvious individual differences, psychological well-being. Furthermore, there are some women who show evident suffering and it is our duty to understand its nature.

We share the conviction with some authors that human fecundity is not a purely bio-physiological phenomenon, but that it is the result of an 'overdetermined complex of elements' that rests on the reality of the body but implies 'differentiated registers' (Chatel et al. 1996, p. 38.). The human being is a unique and indivisible whole regarding both the psyche–body relationship and the various activities and functions of the psyche (Adler, 1924). The procreative act, be it natural or medically assisted, is, therefore, a 'complex phenomenon' linking inseparably the bodily to the psychic, and which may be understood only if dealt with in its uniqueness and complexity, with the woman as a fundamental reference not only as a biological reality but above all as a 'person', in the widest and most articulate sense of the word, and therefore as a structural element of the couple as well.

Considering the range of emotional-affective experiences and the different individual ways of adjusting to the infertility condition and IVF treatment, we maintain that psychological support, the value of which has already been stressed by other authors (Leiblum et al., 1987; Mahlstedt et al., 1987; Baram et al., 1988; Greenfield et al., 1988; Kentenich, 1989; Atherton and Howel, 1995; Slade et al., 1997; Kemeter and Fiegl, 1998), must be given equal importance with respect to medical intervention, and extended to all those couples who gain access to IVF programmes, before, during and after treatment.

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situation, and who allowed us to widen our knowledge and improve our work.

Footnotes

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References


