Prenatal Attachment and Anxiety: Women Who Decide to Try in Vitro Fertilization and Women Who Procreate Naturally

Monica Pellerone
“Kore” University of Enna, Enna (En), Italy

Sandra Miccichè
Terzo Circolo “Chivasso”, Chivasso (To), Italy

Women who conceived after in vitro fertilization are emotionally vulnerable; they show high level of anxiety and distress compared with women who procreated naturally; level of anxiety seem to be related to their welfare and the fear of being separated from their son. Aims of this study are: to compare prenatal attachment and level of anxiety among women after IVF (in vitro fertilization) and women who conceived naturally; to identify predictors of attachment during pregnancy. We hypothesize: (1) a correlation between anxiety and maternal-fetal attachment in both groups; (2) the absence of a relationship between maternal age, waiting time to conception and maternal-fetal attachment in control group; and (3) a relationship between gestational age, waiting time to conception, fear of not being pregnant, and MFA (maternal-fetal attachment) in study group. The sample is made up of: control group of 48 women, aged between 18 and 41 years (24-37 gestational weeks); study group of 43 women aged between 21 and 42 years (23-37 weeks). They completed: MFAS (Maternal-Fetal Attachment Scale), STAI (The State-Trait Anxiety Inventory), and a questionnaire to collect socio-demographic data. The results show that the fear of not getting pregnant is positively correlated with age and with high-risk pregnancy. In the study group, the interaction between gestational age and chronological age influences the state anxiety; the interaction between high-risk pregnancy and waiting period influences the MFAS, the state and trait anxiety. Implications of this study and directions for further research are discussed.

Keywords: maternal-fetal attachment, anxiety, in vitro fertilization, conceiving naturally, pregnancy

Introduction

Gestation functions as a bridge from what a woman is to what she will become; the required developmental task is to become mother and face to herself in a period of psycho-physical transformations (Bibring, 1975; Deutsch, 1977; Randaccio & De Padova, 2004). This laborious process can be influenced by individual factors, such as personality traits and social variables; in fact, according to Erikson’s theory (1968), the individual develops from “psychosocial stages”, and stresses that the experience that is produced by such settings influences the phases of development (Pellerone, 2013).

From a psychoanalytical viewpoint, pregnancy can be schematized into four steps: (Manfredi & Imbasciati, 2004; Pines, 1972, 1982, 2011):

(1) conception: the mental perception of the baby appears before the biological one, considered as the insight of pregnancy in the woman psychic reality;

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Monica Pellerone, assistant professor, psychologist and psychotherapist, Faculty of Humanities and Social Sciences, “Kore” University of Enna.
Sandra Miccichè, psychologist, teacher, Terzo Circolo “Chivasso”.
(2) first three-month period: gradual acceptance of pregnancy phase, characterized by ambivalence (acceptance/refusal of dyad) that is revealed through somatic manifestations, such as nauseas, alimentary intolerance, hunger attacks;

(3) second trimester: or phase of adaptation, characterized by fetal movement’s perception and by anxieties and imaginings manifestations: loss anxieties due to the consciousness of fetus as an autonomous being; fears of one’s own or baby’s malformations; persecutory anxieties connected to the appalling mental picture of the baby kicking so ravaging mother’s body; imagining a wonderful or malformed baby;

(4) third quarter period: characterized by a lethargy and passivity condition as the woman concentrates on herself and on the childbirth, isolating herself from external world. Worries arise for the childbirth and about separation from fetus, woman especially fears that the baby or herself might die. Anxieties relating to her own birth and to the loss of maternal body;

(5) in the end, the childbirth is the evident proof of one’s own power to give life, but this is inevitably related to pain.

Similarly, Soifer (1971) distinguishes seven periods in which an excess of anxiety matches to the physical symptoms: in the first month, anxiety is connected with uncertainty about occurred conception and one’s own capability of looking after the baby. In the following phase, the abortion risk, which is very high until the third month of pregnancy, is related to the fear of embryo implantation. From 4° to 5° month, fetal movements become perceivable, but they may be denied or unconsciously interpreted like baby’s menacing signs. During the last month, uncertainty about the childbirth date causes anxiety as well as baby’s increase in weight and size. In the end, the last days before childbirth are characterized by distress due to delivery, pains, and fear for one’s own death or baby’s.

During pregnancy, so the mother and fetus live in symbiosis and even during this period of gestation, the mother thinks about, imagines and talks to her baby, she communicates to the fetus whatever she feels; their relationship is regulated on emotional level too not just nutritional.

In 1981, Cranley defines maternal-fetus attachment like the extent to which the woman shows behaviors that express interaction and affective involvement towards her baby. Years later, Muller (1990) defines antenatal attachment like the unique love relationship between a woman and her fetus.

Speckhard (1997) suggests that maternal attachment starts far before birth, when the woman begins shaping the baby’s mental image and wishes to grow and protect him/her. The more pregnancy goes on, the more maternal-fetus attachment gets stronger, especially from the 18th to the 22nd week, thanks to phenomena such as woman body growth, fetus body image, and fetal movements (Righetti, Dell’Avanzo, Grigio, & Nicolini, 2005).

This relationship can be influenced by several factors; for instance, Lumley (1972) states that attachment development rate and level seem to be influenced by the gestational progress, by fetus movements number, by pregnancy story, and by mother’s attachment story.

Several studies have tried to clarify as some features can influence prenatal attachment development, such as: variables concerning parents psychopathology, like depressive symptoms or anxiety-inducing; factors concerning the emotional-affective background, like a dysfunctional attachment to one’s own parental figures; elements connected to previous abortions or perinatal death (Cannella, 2005; Laxton-Kane & Slade, 2002).

In particular, it may be assumed that a depressive condition determines a low maternal attachment but the results are discordant: in a survey on 238 pregnant women, Condon and Corkindale (1977) found an opposite
correlation between depressive symptoms and global grade of maternal-fetus attachment; whereas Honjo et al. (1993), in a survey on 216 women between the third and sixth gestation month, could not find any connections between depressive symptoms and maternal-fetus attachment.

Other researchers have revealed an even contrasting tendency: Priel and Besser (1999), in a research on 73 women in the last gestation trimester and in the first eight weeks post-partum, have noticed how a high attachment is connected to depressive symptoms.

Earlier literature shows that anxiety and maternal stress are predictive of a low maternal-fetus attachment. (Cranley, 1981; Gaffney, 1986), but recent surveys did not find this tendency (Cannella, 2005).

Previous experiences of abortion or prenatal death make difficult to parents to establish a proper attachment with the baby they are waiting to. The experience of emotionally investing in a tie that breaks abruptly with the baby loss leaves parents in a loss and grief situation that not always is felt by parents themselves and recognized by the belonging affective environment.

In confirmation of that, in a research on pregnant women who had experienced abortions, Armstrong and Hult (1998) noticed a lower level of maternal-fetus attachment in pregnant women that had lost their babies compared to the control group.

It can be assumed that women who conceive by means of assisted conception techniques may show high level of MFA, considering that they have suffered long infertility periods increasing their emotional-affective involvement in pregnancy. In fact, although medical assisted conception techniques give the possibility to procreate a child; these are very intrusive, since they require follicular growth induction and multiple maturation of oocytes, the taking of oocytes, in vitro fertilization and embryo culture in the first stages of segmentation, in the end the embryos transfer into uterine cavity.

Repeated and invasive interventions on women’s bodies (sometimes on men’s too), required by medical protocol that couples undergo, cause complex reactions hitting different levels of a person: functional, physiological, and psychological levels. Further, assisted conception treatments are usually repeated because of difficulty of embryo implantation, therefore the wish of a baby is.

In particular, literature shows that the IVF women had more muscular tension and were more anxious about losing the pregnancy than the women conceiving naturally. The IVF women with high infertility distress were more anxious about losing the pregnancy and less ambivalent than the women with lower distress (Hjelmstedt, Widström, Wramsby, Matthiesen, & Collins, 2003).

For instance, Hynes, Callan, Terry, and Gallois (2011) studying depression, self-esteem, and self-control of infertile women (at the beginning and in the end of an in vitro fertilization failed attempt), noticed that before treatment, women were more depressed, they had low self-esteem and were less confident compared to the control group of women (conceiving naturally); after treatment failure, a further decrease in self-esteem and a considerable increase in depression occur.

Similar negative effects have been noticed by Visser, Haan, Zalmstra, and Wouters (1994) who showed that before and during a single assisted fertilization treatment, women show a considerably greater anxiety in comparison with the control group, and more, after treatment failure depressive symptoms increased.

Furthermore, later researches prove that in conceiving naturally women and in those subjected to assisted fertilization, anxiety level seems similar at times during third trimester, the later manifest greater anxiety towards pregnancy (McMahon et al., 2012). In particular, higher anxiety levels during pregnancy are correlated to treated mothers’ worry about the baby’s survival and health, possible damages to the baby during the
delivery and to their fear to be separated from their newborn child (McMahon et al., 2011; Hammarberg, Fisher, & Wynter, 2008).

In the light of the recent literature, the objectives of this work are: (1) to explore the maternal-fetal attachment of pregnant women during natural pregnancy and in those women who is receiving assisted reproduction treatment; (2) to investigate, both in the study group and in the control group, the relationship between MFA and independent variables such as chronological age, gestational age, waiting time, any failed attempts at pregnancy, the presence of a high-risk pregnancy and other children; and (3) to identify a possible relationship between level of anxiety and maternal-fetal attachment.

In particular, it is assumed that: (1) the study group differs from the control group as regard to the levels of maternal-fetal attachment; (2) the presence of a significant relationship between maternal age, the waiting time, and the maternal-fetal attachment in the control group; (3) the existence of a significant relationship between gestational age, time to pregnancy, the fear of not being pregnant and maternal-fetal attachment in the study group; and (4) the presence of a correlation between the anxiety level and maternal-fetal attachment in both groups.

Materials and Methods

Subjects

The research was carried out by comparing a sample of women who is receiving assisted reproduction treatment with a control group consisting of pregnant women naturally.

The study group is composed of 43 Italian women aged between 21 and 42 years (\(M = 31.63; S.E. = 0.71; S.D. = 4.65\)), pregnant from the 23rd to the 37th week of gestation (\(M = 28.58; S.E. = 0.59; S.D. = 3.76\)); in particular, women of study group have a waiting period becoming pregnant between the 12th and the 96th week (\(M = 26.56; S.E. = 2.24; S.D. = 14.69\)).

The control group consists of 48 pregnant women, who conceived naturally, selected between the 24th and the 37th week of gestation (\(M = 31.04; S.E. = 0.59; S.D. = 4.11\)), between the ages of 18 and 41 years (\(M = 29.50; S.E. = 0.81; S.D. = 5.62\)); women of control group have a waiting period (becoming pregnant) between the 1th and the 24th the week (\(M = 2.89; S.E. = 0.77; S.D. = 5.26\)).

Instruments

Control group and study group completed. (1) MFAS (Maternal-Fetal Attachment Scale) by Cranley (1981), in order to measure the maternal-fetal attachment during pregnancy. The questionnaire (presented in the original version) consists of 24 items identified five subscales: (1) taking over the role: a woman’s ability to imagine herself as a future mother, and thoughts related to the maternal roles of nutrition and taking care of her own child; (2) differentiation of self from fetus: the woman’s pleasure at the thought of an “other” kicking in her belly, in her womb; (3) interaction with the fetus: the desire to speak to her fetus and refer to him by a nickname, or stimulate it in various ways through the belly; (4) attribution of features to the fetus: the recurring thoughts of the woman on what she can feel in her stomach or on the personality traits that can be attributed to the fetus based on the movements; and (5) giving of self: the willingness of women to engage during pregnancy by restricting some activities which are potentially dangerous for the fetus and the perception of changes, concerns, typical problems related to pregnancy. Reliability coefficients for MFAS show that: for women the internal consistency is 0.84, for men it is equal to 0.86; for women with gestation 0.20 weeks the score is 0.83, for women with gestation 0.20 weeks it is equal to 0.87.
(2) STAI (The State-Trait Anxiety Inventory) of Spielberger, Gorusch, and Lushene (1970) for the assessment of anxiety; the questionnaire consists of 40 items, which are divided into two sub-scales, the STAI T-Anxiety Scale (trait anxiety), and the STAI-S Anxiety Scale (state anxiety). The first scale measures anxiety conceived as a particular experience, such as feelings of insecurity, helplessness in the face of a perceived damage that can lead to or concern or to escape and avoidance, the trait anxiety, is the tendency to perceive stressful situations as dangerous or threatening and to respond to various situations with different intensity. The Italian version used was adapted from Pedrabissi and Santinello (1989), the degree of internal consistency calculated with the Cronbach’ α is equal to 0.83.

(3) Anamnestic data were collected through the administration of a questionnaire constructed ad hoc for the goals of the research, investigating the following variables: age, gestational age, waiting period before becoming pregnant, the number of tentative, high-risk pregnancy, fertilization technique used (IVF, ICSI, FIVET, IUI), the presence of other children.

Data Analysis

For the preliminary analysis: It was carried out a correlation analysis (Pearson’s correlation) to measure the relationship between the independent variables and t-test to compare the control group and the study group in reference to the independent variables; it was carried out the Univariate Analysis of Variance to measure if the number of attempts that have already been made influences the fear of not getting pregnant.

In order to investigate the relationship between MFA and independent variables, an Univariate Analysis of Variance was carried out; the Manova is used to investigate the relationship between state and trait anxiety with independent variables.

Linear multiple regression analysis was used to study predictive variables of maternal-fetal attachment.

Results

Preliminary Analysis

In reference to the study group, most of them did not have a high-risk pregnancy (69.8%); however, they declared they had previously feared not being able to get pregnant (76.7%). Within the study group, the majority of women was subjected to ICSI (IntraCytoplasmic Sperm Injection) (72.1%) and 20.2% to FIVET (the in vitro fecondation with embrio-transfert) method and they had no other children (93%).

The control group is divided evenly between the women who declare to have had the fear of not being able to get pregnant (54.2%) and those who did not fear that, while most of them declare not to have a high-risk pregnancy (81.3%).

The two groups differ in age of gestation ($t = -3.075$, $df = 85$, $p < 0.01$), the waiting period ($t = 10.345$, $df = 88$, $p < 0.01$) and, at the level of trend, even for age ($t = 1.954$, $df = 89$, $p < 0.05$).

The preliminary analysis shows that in both groups the fear of not getting pregnant is positively correlated with age ($r = 0.318$, $p < 0.01$) and with the presence of high-risk pregnancy ($r = 0.257$, $p < 0.05$).

In the study group, the preliminary analysis does not show a significant relationship between the presence of a high-risk pregnancy and the technique used ($p = 0.38$), and between the high-risk pregnancy and number of previous children ($p = 0.27$). It shows, in addition, positive correlations between chronological age and the waiting period ($r = 0.52$, $p < 0.01$) and between age and number of attempts ($r = 0.34$, $p = 0.03$), i.e., the older the woman is, the greater is the chance that she has waited a long time this pregnancy or that she has made previous attempts.
Univariate analysis of variance shows that, in the study group, the number of attempts that have already been made influences the fear of not getting pregnant ($F = 63.97$, $df = 35$, $p < 0.01$), since the use of previous treatment can discourage women and increase their fear to be sterile.

**Maternal-Fetal Attachment**

In reference to the study of maternal-fetal attachment in the control group, univariate analysis of variance shows that both the age of the mothers ($F(6, 41) = 10.72$, $p < 0.05$) and the waiting period before becoming pregnant ($F(1, 41) = 19.34$, $p < 0.05$), seem to affect the levels of MFAS; therefore this result confirms the hypothesis of initial research that there would be the presence of a significant relationship between the maternal age, the waiting period, and maternal-fetal attachment in this group.

The same analysis of the data shows that within the study group, the overall score MFAS is influenced by gestational age ($F(7, 32) = 26.03$, $p < 0.01$), the waiting period ($F(8, 32) = 20.68$, $p < 0.05$) and by the number of attempts ($F(2, 32) = 8.25$, $p < 0.05$), this fact agrees with the research hypothesis.

One thing that is interesting is that the two groups differ in the level of maternal-infant attachment ($t = 5.89$, $df = 89$, $p < 0.05$), in particular, to disconfirm the international literature and the first research hypothesis, the analysis of the average scores shows that pregnant women who conceive naturally show the highest average scores in maternal-fetal attachment ($M = 55.56$; $S.E. = 0.89$; $S.D. = 6.21$) than women who conceive with assisted fertilization IVF ($M = 48.48$; $S.E. = 1.32$; $S.D. = 8.65$).

In reference to the subscales of MFAS, the two groups differ in self-differentiation from fetus ($t = 3.21$, $df = 89$, $p < 0.05$): in particular, pregnant women who conceive naturally show the highest average scores ($M = 15.60$; $S.E. = 0.22$; $S.D. = 1.55$) than women who conceive with assisted fertilization IVF ($M = 15.84$; $S.E. = 0.32$; $S.D. = 2.11$).

Within the study group, the multiple linear regression analysis shows that the presence of other children is a predictive variable of awareness of maternal role (62.4% of total variance explained). The same analysis emphasizes that the gestational age is predictive of the ability of self-differentiation from the fetus (59.9% of total variance explained).

**Strait Anxiety and Trait Anxiety Level**

In reference to the analysis of the level of anxiety, none of the independent variables seems to affect significantly both state anxiety and trait anxiety within the control group.

In contrast, in the study group, an analysis of multivariate factorial variance was made in order to verify the influence of the gestation period, the waiting period and the number of failed attempts on the anxiety level; as for anxiety state, the Manova highlights the main effect linked to the period of gestation (Wilks’s lambda = 0.01, $F(7, 32) = 13.20$, $p < 0.05$), waiting time (Wilks’s lambda = 0.01, $F(8, 32) = 4.49$, $p < 0.05$), and previous attempts to get pregnant (Wilks’s lambda = 0.09, $F(2, 32) = 7.39$, $p < 0.05$).

Similarly, as regard to trait anxiety, the Manova highlights the effect of the gestation period ($F(7, 32) = 9.05$, $p < 0.05$) and expectation ($F(8, 32) = 19.35$, $p < 0.01$).

The initial hypothesis has been disproved; in fact the maternal-fetal attachment does not seem to be correlated to the levels of anxiety in either group of women who is receiving assisted reproduction treatment or in the control group: It does not appear that anxiety is correlated in specific manner with fetal attachment.

Within the study group, the scores of MFAS, the number of attempts and the presence of a high-risk pregnancy would explain the anxiety state (72% of total variance explained).
Discussion

With respect to the first objective, it seems the research hypothesis to be disproved according to which, women of study group would have to have a higher maternal-fetal attachment compared to the women of control group, because research data reveal that women with natural pregnancy show a greater feeling of attachment to the new baby.

In fact, longitudinal studies on attachment along the first, second and third trimester of pregnancy, showed a typical trend that women are becoming progressively more attached to their children as the pregnancy progresses (Cannella, 2005; Laxton-Kane & Slade, 2002).

Regardless of maternal age, the majority of women manifested an increase of attachment in the second quarter, in particular the increment is linked to the perception of the first fetal movements. It happens the interesting fact, repeatedly confirmed in searches, that women more susceptible to fetal movements are also the same ones that get the most points in the attachment to the fetus (Heidrich & Cranley, 1989).

The second objective concerned the study of the relationship between independent variables, such as maternal age, gestational age and waiting period and the independent variable, that is the level of maternal-fetal attachment in the control group: the research data, confirming the initial hypothesis, show that both the age of the mothers and the waiting period before getting pregnant affect the levels of MFAS.

The third objective, aimed at verifying the presence of significant relationships between maternal-fetal attachment, gestational age, time of expectation and fear of not being pregnant in the study group, appears to confirm the hypothesis of initial research: the levels of MFAS appear affected by gestational age, the waiting period and the number of failed attempts previously, in particular the older is the gestational age, the waiting and the number of failed attempts and the greater the maternal-fetal attachment will be, these data correspond with the hypothesis of research and with data in the literature.

The last hypothesis is not corroborated: The maternal-fetal attachment does not seem to be correlated to levels of anxiety in either group of women with artificial insemination or in the control group. In fact, from the results, the MFAS and its related subscales are associated neither with STAI scores in the group of women with artificial insemination nor in the control group: It does not seem anxiety correlates in a specific form with fetal attachment. Interesting associations were detected between other variables.

Another fact that emerged from the research is that the fear of not getting pregnant influences significantly the overall score MFAS score, in fact, the fear of not getting pregnant explains significantly the increase in MFAS scores: the higher the fear of not getting pregnant is, the greater attachment to the fetus will be. In this case, it could be assumed an “iperinvolvement” on the part of the mother, who addresses her anxieties towards his/her unborn child.

Another fact that seems interesting is how the presence of other children is predictive in the expectant mother of her early capacity to imagine herself as a mother and develop thoughts about the maternal roles of one nutrition and taking care of her own child, since the mother that has other children might feel more “confident” in their relationship with their child.

The gestational age, finally, seems to explain the ability of self-differentiation from the fetus, developing in the mother the thought of an “other” in her belly kicking and moving as a being distinct from herself.
Conclusion and Clinical Implication

This search highlights two practical implications in this work: It seems important to clear the idea that anxiety disorders are present exclusively in the postpartum period, as often the roots of these illnesses can be found already in the period of pregnancy. Tracking down early high levels of anxiety is an important objective, because it allows you to act quickly, before these emotional changes can strongly affect the relationship between the mother and the child, influencing the subsequent psychological development of child.

In addition, the woman with high-risk pregnancy might try not to disappoint herself with respect to accomplishing her dream of having a baby, then using a strategy of avoidance of psychic pain that avoids facing unbearable suffering in the event of an early abortion. The results suggest that IVF couples may need additional emotional support in early pregnancy.

References


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