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IN VITRO FERTILIZATION - EMOTIONAL REACTIONS TO TREATMENT, PREGNANCY AND PARENTHOOD

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To Christer, Per, Karin and Sofia

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ABSTRACT

The overall aim of this thesis was to study the emotional reactions of women and men entering IVF treatment and to study the emotional reactions during pregnancy and postpartum in couples who have achieved a pregnancy following IVF.

Ninety-one couples seeking IVF treatment were investigated regarding gender differences in stress related to infertility. The couples filled in a questionnaire covering psychosocial aspects of infertility and a scale assessing coping-style. It was found that the women reported stronger stress related to infertility than the men, and they also felt an intense desire to have a child. They received more social support than their partners, who experienced the fulfilment of the male role as well as the social obligation to become a parent as the most central aspect of infertility.

Our longitudinal study included 57 women who had achieved a pregnancy via IVF (IVF women), 55 of their male partners (IVF men), 43 women who had achieved a pregnancy without assisted reproductive technology (control women) and 39 of their male partners (control men). The subjects were assessed three times during pregnancy and again at two and six months postpartum. They completed a personality inventory and a series of self-rating scales measuring emotional responses to pregnancy, anxiety, their attitudes toward parenthood, marital satisfaction and parental stress. The IVF subjects were interviewed about their experiences of pregnancy, parenthood and perception of infertility, post successful treatment. The IVF women had more muscular tension and tended to be more irritable compared to the control women. The IVF men had more somatic anxiety, indirect aggression, feelings of guilt, more detachment and they tended to have more psychic anxiety than the control men. Anxiety about loosing the pregnancy was stronger among the IVF women and the IVF men from early to late pregnancy as compared to the controls. The IVF women experienced their pregnancies in a less negative way, they were less concerned about the child's gender than the control women, and they were also less worried about possible "loss of freedom" in their future lives as parents. The IVF men were more anxious that the baby might be injured during birth as compared to the control men. Associations were found between a high degree of previous infertility distress and high levels of pregnancy related anxiety among the IVF women and the IVF men. Levels of parental stress among IVF parents were equal to those of the control parents. The pattern of marital satisfaction during transition to parenthood was comparable among IVF parents and control parents, with a decline from early pregnancy to six months postpartum. The results of the interviews with the IVF subjects showed that, negative feelings related to infertility are not easily overcome even though an IVF treatment is successful and parenthood achieved.

The results showed that gender may affect how infertility is perceived and how coping strategies are chosen when dealing with infertility distress. Concerning strategies for antenatal care, it is important to pay attention to an elevated anxiety level among IVF couples that should be acknowledged while also lending support to normalize the pregnancy. In addition, it is essential to give them extra time to discuss pregnancy experiences and their future life as parents. It seems that the inability to conceive naturally continues to affect the emotions of a proportion of IVF parents even if pregnancy is achieved and a child is born. The results suggest that IVF parents may benefit from counselling with regard to the potential long-term impacts of infertility.

Key-words: in vitro fertilization, infertility distress, pregnancy, parenthood, personality traits, anxiety, marital relationship

LIST OF PUBLICATIONS

This thesis is based on the following articles, which will be referred to by their Roman numerals:

- I Anna Hjelmstedt, Lena Andersson, Agneta Skoog-Svanberg, Torbjörn Bergh, Jacky Boivin and Aila Collins. Gender differences in psychological reactions to infertility among couples seeking IVF- and ICSI-treatment. *Acta Obstetricia et Gynecologica Scandinavica* 1999; 78:42-48.
- II Anna Hjelmstedt, Ann-Marie Widström, Håkan Wramby, Ann-Sofi Matthiesen and Aila Collins. Personality factors and emotional responses to pregnancy among IVF couples in early pregnancy: a comparative study. *Acta Obstetricia et Gynecologica Scandinavica* 2003; 82:152-161.
- III Anna Hjelmstedt, Ann-Marie Widström, Håkan Wramby and Aila Collins. Patterns of emotional responses to pregnancy, experience of pregnancy and attitudes to parenthood among IVF couples: a longitudinal study. *Journal of Psychosomatic Obstetrics & Gynecology* 2003; 24:153-162.
- IV Anna Hjelmstedt, Ann-Marie Widström, Håkan Wramby and Aila Collins. Emotional adaptation following IVF. Accepted for publication in *Fertility and Sterility*.

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LIST OF ABBREVIATIONS

ART	Assisted Reproductive Technology
FSH	Follicle Stimulating Hormone
GnRH-a	Gonadotropin-Releasing Hormone agonist
hCG	Human Chorionic Gonadotropin
ICSI	Intracytoplasmic sperm injection
IVF	In vitro fertilization

1 INTRODUCTION

1.1 INFERTILITY

Infertility is defined as the inability of couples of reproductive age to conceive or to bring a pregnancy to term after one year of unprotected intercourse (WHO, 2002). The causes of infertility can be divided into three broad categories, female factor (i.e., tubal damage, endometriosis), male factor (sperm dysfunction), and combination of male and female factors, with each group constituting approximately one third of causes (Gottlieb, 2001). Between ten to fifteen percent of infertile couples are diagnosed as having unexplained infertility (Stovall and Guzick, 1993). In these cases the cause of infertility cannot be identified. The global prevalence of infertility varies. Ten to fifteen percent of couples in industrial countries experience primary or secondary infertility (Healy et al., 1994), while a prevalence of secondary infertility of 20-25 % has been reported in some sub-Saharan African countries (Larsen, 2000). Larsen concludes that infertility is a public health problem in these regions (Larsen, 2000).

There are several options for treatment of infertility. Ovarian stimulation, for example, which is a hormone treatment, can be used for women with ovarian dysfunction (Bergh and Hagenfeldt, 1998; Gottlieb, 2001). There also exist various assisted reproductive technologies (ART) such as insemination (Gottlieb, 2001) and in vitro fertilization (Gottlieb, 2001; Nilsson et al., 1998). The couples' own gametes can be used or donated gametes can be used in ART. In Sweden, it is since 2003, possible to use donated sperms or oocytes in ART. According to the Swedish legislation, a child conceived through ART has the right to get information about its genetic origin as adult (Socialstyrelsen, 2002).

1.2 IN VITRO FERTILIZATION

In vitro fertilization has become a common and an increasingly used treatment for infertility in industrial countries. In Sweden, the number of IVF treatments increased from 2700 to 6600 between 1991 and 2000 (Socialstyrelsen, 2003). The major indications for IVF are tubal pathology, endometriosis and unexplained infertility (Nilsson et al., 1998). After the introduction of the intracytoplasmic sperm injection (ICSI) technique about ten years ago, it is also possible to treat couples where the men have a sperm dysfunction (Gottlieb, 2001).

A short description of the procedure of an IVF treatment is presented below. The controlled ovarian hyperstimulation protocol that is described is the protocol that was used in the treatments of the women in this study. For details of the protocol see Csemiczky et al., 1996 (Csemiczky et al., 1996), and for details of an IVF procedure see Rabe et al., 2000 (Rabe et al., 2000). The routines that are described are those that were employed among the couples in the present study.

In the first phase of the IVF treatment, the women used a nasal spray containing Gonadotropin-Releasing Hormone agonist (GnRH-a) in order to down-regulate the ovaries. In the next phase, the women received injections with Follicle Stimulating Hormone (FSH), to stimulate the development of several follicles in the ovaries. The development of follicles was then monitored by ultrasound. When there were one or more follicles with a diameter of at least 17 mm, the women received an injection with Human Chorionic Gonadotropin (hCG). Thirty-five hours later the follicles were

aspirated transvaginally under ultrasound guidance. Sedation, analgesia and/or local anaesthesia were given to the women. The man was often present during the procedure to support his partner and together the couple could follow the aspiration of follicles on the ultrasound screen. The same day, the men delivered a semen sample. In standard IVF the oocytes and sperms were placed in petri dishes, whereas when using ICSI, a single sperm was injected directly in an oocyte. After two to three days the embryos had reached the four- to eight-cell stage. One to three embryos were transferred through the cervix into the uterus, by the use of a soft catheter.

1.3 IVF PREGNANCIES AND DELIVERIES IN SWEDEN

The statistics of the IVF treatments that were performed in Sweden during 2000 showed that 23.7 percent of the women who had embryos transferred gave birth. The number of live born children was 2237. Twenty-one percent of the deliveries were multiple births. The rate of Caesarean sections was 31 percent (Socialstyrelsen, 2003). The total number of live born children in Sweden during 2000 was 90441 (StatisticsSweden, 2000). Thus, the proportion of children born as a result of IVF in Sweden during 2000 was 2.5 %.

Deliveries and children born via the utilization of IVF in Sweden between 1982-1995 have been compared with all deliveries and children born in the country during the same time period. The authors concluded that the IVF technique as such, does not harm the fetus or pose a threat to the health of the child. However, the high percentage of multiple births after IVF causes several problems with high frequencies of premature deliveries and low-weight children. Maternal characteristics of the IVF group, such as more advanced age and the infertility disorder as such, also explain the unfavourable outcomes (Bergh et al., 1999).

Strömberg et al. compared the same cohort of IVF children with matched controls and found that the children born after IVF were more likely to need habilitation services. However, the risk of developing neurological problems, were due mainly to the high frequency of multiple deliveries, low birth weight and prematurity among the IVF children (Stromberg et al., 2002; Strömberg et al., 2002).

Wennerholm et al. studied 1139 children born after ICSI. They found that the ICSI children compared to controls had an increased risk of malformations. This was suggested as being due mainly to a high frequency of multiple births among the ICSI children. The relative risk for hypospadias among ICSI children was three times higher compared to controls, a finding that has been related to the subfertility of the ICSI boys' fathers (Wennerholm et al., 2000).

According to the Swedish national guidelines from 2002, only one embryo shall be transferred to the woman (Socialstyrelsen, 2002).

1.4 EMOTIONAL REACTIONS TO INFERTILITY

Reproduction is central in the lives of most women and men and to have children is often considered to be the meaning of life (Lalos et al., 1985a; Möller and Fällström, 1991b; Wirtberg, 1992). Infertile women often describe feelings of low self-esteem as a result of the failure to conceive, to give birth and to have children, abilities that often are integral parts for female identity. They may feel being less worthy and less valued than others (Möller and Fällström, 1991a; Wirtberg, 1992). Not belonging to the "parental-world" may also have implications for the relationship to family and

friends resulting in strain and feelings of being left out of many social networks (Wirtberg, 1992). Many infertile men describe that they feel inadequate in giving their partner emotional support (Wirtberg, 1992).

According to Whiteford and Gonzalez, the “culturally shaped desire to have children appears to be extremely strong, transcending sex, age, race, religion, ethnicity, and social class division” (Whiteford and Gonzalez, 1995). In a study of South African women living in a diverse cultural urban community, it was found that most of the women described that the infertility problems had led to verbal as well as emotional abuse and a few mentioned physical abuse. Additionally, some feared infidelity and being abandoned by their partner as a consequence of infertility. Among Muslim populations, some women were worried that their men would take a second wife. However, several women described that their partners were supportive, while some of the women also pointed out the negative social implications that not having children had for their partner (Dyer et al., 2002). About 40 % of Nigerian women with secondary infertility reported accusations of being a witch in association with infertility as the reason for divorce or remarriage. Behind this idea, is a belief that witches only have children in the spirit world and that they prevent others from having children (Orji et al., 2002). Chinese men described intense negative reactions after having been informed that they were the cause of infertility. Some men felt like having been sentenced to death. They grieved their inability to continue the family heritage as a cultural obligation and feared that their families and friends would discover that they were infertile (Lee and Chu, 2001). The economical consequences of childlessness may as well be devastating in societies where children have the responsibility for their elders (van Balen and Gerrits, 2001).

The ability to conceive is often taken for granted (Lalos, 1999). When couples become suspicious about their ability to reproduce and take the step to seek medical help they have often experienced repeated ups and downs with hopes every month for a pregnancy followed by disappointment when menstruation occurs. A sense of loss of control of bodily processes has been described as one of the most stressful dimensions of infertility (Mahlstedt et al., 1987). Wright et al. found that both infertile women and men upon first admission to a fertility clinic, were more distressed than individuals in the general population (Wright et al., 1991).

Möller and Fällström investigated couples who contacted a doctor for the first time when they had suspected an infertility problem. As duration of infertility treatment increased and patients experienced repeated failures to conceive, the psychological distress was likely to grow. Depressive reactions, social isolation and feelings of emptiness were common among these couples. Many experienced a deterioration of their sexual life, often as a consequence of “scheduled sex”. Many women experienced that their marital relationship had deteriorated. Among the women, feelings of failure of not being a complete woman, increased over time (Möller and Fällström, 1991a). Lalos et al studied couples where the woman underwent reconstructive tubal surgery and found that in the follow-up assessment of those who had not become pregnant, both women and men reported that their feelings toward each other had changed negatively, and that their sex life had deteriorated. Nearly all experienced feelings of grief (Lalos et al., 1985b). Infertility is described as a crisis reaction by Lalos: “The first reaction includes shock, surprise disbelief and denial, followed by feelings of frustration, anger, loss of control and anxiety. Subsequent reactions often include feelings of guilt, embarrassment, disappointment, isolation, depression, grief and mourning.” However, the crisis of infertility differs from that of

a general traumatic crisis as infertile subjects may remain in a state of long-term crisis if the problem is not resolved (Lalos, 1999). Demyttenaere points out the paradox, experienced by couples struggling with infertility, of grieving for a nonexistent child while at the same time maintaining hope that a child of their own will exist in the future (Demyttenaere, 1990).

A proportion of couples opt for IVF treatment. Mahlstedt et al., studied couples who entered an IVF-treatment and found that among the subjects who had experienced divorce, 63% described infertility as being as stressful as, or more stressful than, divorce; of the subjects who had experienced death of close family or friend, 58% reported infertility as stressful as, or more stressful than, death (Mahlstedt et al., 1987). Freeman found that before IVF-treatment 48% of the women and 15% of the men described infertility as the most upsetting experience of their lives (Freeman et al., 1985).

The psychological demands of going through IVF are strong for many couples (Mahlstedt et al., 1987) with the weeks prior to the pregnancy test described as the most stressful period (Boivin et al., 1998; Callan and Hennessey, 1988; Laffont and Edelmann, 1994). The pattern of distress during the IVF procedure is similar among women and men (Boivin et al., 1998). A failure to conceive after IVF is often accompanied by depression, anxiety, (Baram et al., 1988; Newton et al., 1990; Slade et al., 1997) sadness and anger (Laffont and Edelmann, 1994).

1.5 STRESS AND COPING

The literature on stress and coping is voluminous and it includes a broad spectrum of research from cellular aspects to psychological aspects. Here, a short historical background on the “fight or flight response” will be presented, followed by a brief summary of the concept stress and theories of coping that are relevant to this thesis. The definition of stress has been confusing as the word stress has been used both to describe events that provoke a reaction, as well as the reactions themselves. Pearlin et al. define stressors as conditions that threaten the well-being of people and stress is the psychological, physical, physiological or biochemical impact of the stressor on the organism (Pearlin et al., 1981).

The “fight or flight response” was first described by Cannon in the nineteen-thirties. When we are confronted with a threat, our physiological system activates which enables us to either fight a danger or fly from it. This bodily adaptation has been a prerequisite for our survival (Cannon, 1939). Seyle linked stress to illness. He proposed that the biological reactions are the same regardless whether the stressor is physical or emotional. Seyle saw the general adaptation syndrome (GAS) as having three phases: mobilization of resources, resistance and exhaustion (Seyle, 1974). Lazarus developed the notion of appraisal and coping. Primary appraisal refers to the meaning of how an event is estimated by the individual. The event can be assessed as irrelevant, positive or threatening/ challenging/harmful. Secondary appraisal is the assessment of one’s coping abilities and resources and whether or not they are sufficient to meet a threat/challenge/harm. A defensive reappraisal is a way to deal with harm or threat by reinterpreting them as less harmful or threatening. (Lazarus, 1999). Together with Folkman he has developed a model where they divide coping strategies into two main forms, problem focused coping (i.e. to make a plan of action to handle a threat) and emotional focused coping (i.e. to try to forget about a threat). The coping strategies an individual chooses may change from one time to another. No

universally effective or ineffective coping strategy exists and an effective approach to coping depends on being flexible. For example, problem focused coping may be effective in controllable situations whereas emotional focused coping can be effective in uncontrollable situations (Lazarus and Folkman, 1984).

To seek social support is one strategy to cope with stress. The number of social relationships an individual has and the quality of the relations are factors that have a high impact on an individual's physical and mental health. One hypothesis suggests that social support is a buffer against negative effects of stress during strongly demanding situations, while another hypothesis proposes that social support has a continuously positive effect in making an individual less prone to stress (Westen, 1996).

Miller distinguishes between two styles of information seeking when individuals are confronted with a threat. Those labelled as "monitors" choose to cope with the threat by seeking out information whereas "blunters" choose another coping style by avoiding information about threat. The optimal strategy for patients is when the content of medical information they are given corresponds to their information seeking style. The Miller Behavioural Style Scale is an instrument that has been developed to categorize these two strategies of searching information (Miller, 1987). For further details of the self-rating scale, see the method section.

1.6 INFERTILITY AND PSYCHOLOGICAL DISTRESS

Greil has reviewed studies published from 1980 to 1997, on infertility and psychological distress. He distinguishes between three different hypotheses regarding the causality between infertility and stress (Greil, 1997).

The first hypothesis is that infertility causes stress. Descriptive studies show that the negative psychological consequences of infertility are great although several studies where standardized measurements of psychiatric symptoms or psychological distress have been used have failed to show differences between infertile subjects and controls (Greil, 1997).

The second hypothesis is that stress causes infertility. Greil argues that this hypothesis is worth further scrutiny and refers i.e. to the work by Domar et al. and Wasser et al.(Greil, 1997). Domar et al. showed that women who received cognitive-behavioural treatment (i.e. relaxations techniques, imagery, autogenic training, yoga) or took part in a support group during infertility treatment had higher rates of viable pregnancies compared to women who did not receive any additional support. The authors discuss whether a decrease of psychological distress might influence the reproductive system and thus increase the likelihood of conception. They refer to research suggesting that psychological distress can have an effect on multiple biological systems, the hypothalamic-pituitary-adrenal axis, the immune system and the hypothalamic-pituitary-ovary axis and that these systems can interact in an unfavourable way and impede pregnancy (Domar et al., 2000). Wasser et al. found that infertile women with a hypothalamic-pituitary-ovarian endocrine disorder, such as luteal phase defect, rated greater psychosocial stress, fewer sources of social support and more conflicts with significant others, than women with organic infertility (i.e., tubal damage). Furthermore, they found that women with a hypothalamic-pituitary-ovarian endocrine disorder, who were not attempting pregnancy, also reported higher psychosocial stress than women with organic

infertility who tried to conceive. The authors refer to the Reproductive Filtering Model that stipulates that the reproductive system in mammals is suppressed when there is a lack of social support. From an evolutionary perspective, the survival of many mammal offspring is dependent on female access to a social support system in order to help her to protect the offspring from predators. The authors suggest that psychosocial stress contributes to the etiology of some forms of infertility in humans (Wasser et al., 1993).

The third hypothesis, the psychodynamic hypothesis, claims that unconscious resistance to parenthood may cause some cases of infertility. Most researchers, according to Greil have rejected this hypothesis. For the most part, no differences in personality between infertile and non-infertile subjects or between those infertile subjects who have become and those who have not become pregnant have been found. Neither has differences been found between couples with organic infertility versus couples with unexplained infertility (Greil, 1997).

However, in a recently published study it was found that couples with unexplained infertility reported more harm avoidance than couples with an organic infertility. Harm avoidance is a personality trait characterized by cautiousness, passiveness, fearfulness and insecurity and individuals prone to harm avoidance react with strong anxiety and depression to stressful events. The authors discuss whether “different character traits might explain difficulties in coping with stress and stressful events, and might make it easy for stress to influence biologic mechanism, thus reducing fertility” (Fassino et al., 2002a).

1.7 BACKGROUND TO THE STUDY

Levels of anxiety, depression, hostility, cognitive disturbance, stress and loss of self-esteem are higher among women compared to men on first admission to a fertility clinic (Wright et al., 1991). Results from other studies have also indicated that fertility is more important for the emotional well-being of women than that of men and it has been suggested that the negative effects of infertility on quality of life are stronger for women compared to men (Andrews et al., 1991). On the other hand, it has been suggested that men experience involuntary childlessness as being as stressful as women but their reactions and coping strategies are different (Collins et al., 1992; Wirtberg, 1992; Wright et al., 1991). There are a few studies on gender differences in psychosocial reactions among couples entering an IVF- treatment.

It has been speculated whether negative reactions and experiences associated with infertility and IVF-treatment persist after successful treatment and if they affect psychological adjustment during pregnancy and parenthood. Previous studies have found no differences in general anxiety between women pregnant after IVF and other women (Klock and Greenfeld, 2000; McMahon et al., 1997a; Stanton and Golombok, 1993), but higher pregnancy related anxiety have been found among IVF women in the third trimester (McMahon et al., 1997a). Retrospective studies on men with children born with the use of assisted reproductive technology, have found that their greatest worry during their partner’s pregnancy was miscarriage (Braverman et al., 1998) and that previously infertile men experienced the pregnancy as more stressful than control men (van Balen et al., 1996). A prospective study of IVF men at the 30th week of their partner’s pregnancy found no differences in ratings of global anxiety compared to control men (McMahon et al., 1997a) However, no studies have examined the pattern of emotional responses related to pregnancy longitudinally

either among IVF men or IVF women. It is of importance to study whether there are differences regarding the pattern of emotional response to pregnancy between IVF couples and normally conceiving couples and whether additional emotional support is warranted for the IVF population.

Concerns have been raised about whether IVF couples have unrealistic expectations for themselves as parents and idealize parenthood and whether they also experience elevated parenting stress levels. No differences between IVF parents and parents with a naturally conceived child have been found (Colpin and Soenen, 2002; Gibson et al., 2000), while conversely, there are reports of less stress among parents with children born after ART (Golombok et al., 1995). In order to assist in the resolution of this contradiction, parental stress among IVF parents needs further elucidation.

Marital satisfaction is generally high among couples who initiate an IVF treatment (Hearn et al., 1987; Leiblum et al., 1987). It has been suggested that these couples represent a selected population that have worked through relational problems linked to infertility and that the experience of struggling together to come to terms with the infertility problem has strengthened their relationship. Among new parents in general, the birth of the first child is often followed by relational problems (Belsky and Rovine, 1990; Cox et al., 1999; Tomlinson, 1987b). Comparisons of marital satisfaction between parents with a child conceived after ART and parents with a naturally conceived child have been diverse, showing less marital conflicts among ART parents (Golombok et al., 1995), as well as more marital conflicts among this group of parents (Gibson et al., 2000; Hahn and DiPietro, 2001). Also, no differences have been found between ART parents and other parents (Colpin et al., 1995; McMahon et al., 1997b; Weaver et al., 1993). Each of these studies used a cross-sectional design and only one longitudinal study thus far has examined partner satisfaction among IVF couples during their transition to parenthood (Sydsjö et al., 2002). That study found that the marital relationship was stable among IVF couples while parents with naturally conceived children rated decreased satisfaction from pregnancy to one year postpartum (Sydsjö et al., 2002)

Even if a previously infertile couple is able to conceive and to have a child after IVF, the cause of infertility still remains and a new treatment may be necessary if a sibling to the child is wanted. Studies have shown that identification with the label of being infertile is very strong (Möller and Fällström, 1991b; Olshansky, 1990) and it may persist even if a child is born (Olshansky, 1990). The emotional well being of previously infertile couples and their ability to cope with infertility after having achieved parenthood has been overlooked. Therefore, it is important to examine how IVF treated women and men experience infertility after successful treatment.

2 AIMS

The overall aim of this work was to study the emotional reactions of women and men entering IVF treatment and to study the emotional reactions during pregnancy and postpartum in couples who have achieved a pregnancy following IVF.

The specific aims were:

- to assess gender differences in stress related to infertility among couples seeking IVF or ICSI treatment. (*Paper I*)
- to investigate if there are differences in emotional reactions during pregnancy between couples who have achieved a pregnancy following IVF (IVF couples) and couples who have achieved a pregnancy without assisted reproductive technology (control couples). (*Paper II and Paper III*)
- to study if there are differences in marital satisfaction during transition to parenthood between IVF couples and control couples. (*Paper II and Paper IV*)
- to assess attitudes to parenthood and parental stress among IVF couples and control couples. (*Paper III and Paper IV*)
- to study perception of infertility post successful IVF treatment. (*Paper IV*)

3 MATERIAL AND METHODS

3.1 MATERIAL STUDY I

Data were obtained from 91 couples seeking IVF-treatment at a private IVF-clinic in Sweden. The couples were asked to participate in the study by a nurse coordinator at the IVF clinic. Three couples declined to participate in the study. The women and men filled separately in a questionnaire and self-rating scales. Background data of the subjects was obtained from answers of the questionnaire and from medical records, see Table 1.

Table 1. Background data of couples seeking IVF or ICSI treatment

	Men n=91	Women n=91
Age (y)		
Mean±SD	34.4±5.5	32.5±4.4
Range	25-52	22-42
Education (%)		
Primary education	15.7%	13.2%
Secondary education	47.2%	47.3%
College/university < 3 years	24.7%	29.7%
College/university > 3 years	12.4%	9.9%
Previous children (%)*	10.9	8.7
Previous pregnancy women (%)		44.6

*"naturally" conceived, conceived through assisted reproduction, fostered or adopted

3.2 MATERIAL STUDY II-IV

A longitudinal study was performed which comprised assessments at pregnancy weeks 13, 26, 36 and two respectively six months postpartum, of couples who had conceived via IVF (IVF group) and couples who have conceived naturally (control group). The inclusion criteria for the women in both groups were the following: 29-36 years of age, primiparous, in good health, pregnant with a singleton, non-smoking, and having adequate skills in the Swedish language. For the men in both groups, the inclusion criteria was to have adequate skills in the Swedish language. Both women and men in the control group did not have previous infertility problems, and their time of trying to conceive had not exceeded one year.

The study group was recruited among couples attending the IVF-units at the Karolinska Hospital and at the Huddinge University Hospital, Stockholm, Sweden. A midwife distributed a leaflet describing the study to the couples at the time of an ultrasound examination, which was performed between the sixth and the ninth week of gestation. These ultrasound examinations were performed in order to confirm fetal viability. The subjects were informed in more detail of the study by the investigator within a few days after they had received their leaflets. The participation rate for the IVF couples who were asked to take part in the study was approximately 74 %. There were no differences between the eligible IVF couples who participated and those who did not with regard to cause of infertility, age of the women, age of the men, duration of infertility or the number of previous IVF treatments on average.

The control group was recruited non-randomly among couples attending four antenatal clinics situated in the suburbs and in the inner communities of Stockholm, Sweden. A midwife distributed a leaflet describing the study at the first appointment at the clinic between the seventh and the fourteenth week of gestation. The subjects were informed in more detail of the study by the investigator within a few days after they had received their leaflets. Participation rate for the control couples who were asked to take part in the study was approximately 50 %.

Initially, 57 women who had conceived via IVF (IVF women), 55 of their male partners (IVF men), 43 women who had conceived naturally (control women) and 39 of their male partners (control men), were enrolled in the longitudinal study. One IVF woman and one control woman terminated their pregnancies because of malformations. Additionally, one IVF man withdrew from the study before pregnancy week 25 because of time constraints and one control couple withdrew from the study because they relocated out of Stockholm. One woman in the IVF group and one woman in the control group lost their infants perinatally. Four IVF women and three control women gave birth before the third assessment. One man in the control group left the family after the baby was born. The numbers of participants at the different assessments are shown below.

	IVF women	IVF men	Control women	Control men
Pregnancy w. 13	57	55	43	39
Pregnancy w. 26	56	53	41	37
Pregnancy w. 36	52	51	38	35
Postpartum 2 m.	55	53	40	36
Postpartum 6 m.	55	53	40	36

The background data of the participants are presented in Table 2, and was obtained by interviews with the couples and from medical records.

Table 2. Background data of the IVF women, the control women, the IVF men and the control men

	IVF women (n=57)	Control women (n=43)	IVF men (n=55)	Control men (n=39)
Years of age				
Mean±sd	32.3±2.1	31.2±1.8	34.0±4.2	33.1±2.8
Range	29-36	29-36	27-51	27-39
Education (%)				
Primary education	3.5	2.3	7.2	0
Secondary education	38.6	27.9	49.1	20.5
College/university	57.9	69.8	43.6	79.5
Number of women with previous miscarriages and/or ectopic pregnancies	20	4		
Number of women with previous abortions	3	22		
Number of men with previous children			3	5

In the IVF group, the distribution of infertility factors, as reported in the medical records were; female, 36.4%, male, 27.3%, a combination of female and male, 10.9 %, and unexplained infertility, 25.5%. In sixteen of the treatments ICSI was used. All women became pregnant by homologous IVF.

The author of this thesis (Hjelmstedt) visited the couples in their homes, where the participants were given self-rating scales to complete. The couples were also interviewed. The couples were interviewed separately and they also filled in the self-rating scales separately.

3.3 METHODS

3.3.1 Self-rating scales

A summary of the self-ratings scales and single items that were used in the projects will be presented.

In Paper I, the Infertility Reaction Scale and the Miller Behavioral Style Scale were used. The scales that were used in Paper II, III and IV and at what time point they were filled in by the subjects are shown in the below flow chart.

	Pregnancy w. 13	Pregnancy w. 26	Pregnancy w. 36	Postpartum
Infertility Reaction Scale (IVF subjects)	X			
Karolinska Scales of Personality	X			
Spielberger State and Trait Anxiety Inventory	X			
Wikman Attitude Scale		X		
Emotional Response to Pregnancy Scale	X	X	X	
Experience of the pregnancy (Women)			X	
Barnett Scale	X			X
Swedish Parenthood Scale Questionnaire				X

Infertility Reaction Scale (Paper I, II and III)

To assess emotional reactions to infertility the Infertility Reaction Scale was used. It consists of 15 items that are rated on a scale from 1 (agree) to 7 (disagree). High scores indicate strong infertility distress. Examples of items are “Inability to have children is more than I can cope with” and “My role as a man/woman is incomplete if we cannot have children” (Keye, W., Deneris, A., and Sullivan, J., 1984, unpublished observations).

Miller Behavioral Style Scale (Paper I)

The Miller Behavioral Style Scale was used to assess coping-strategies in information seeking behavior. Four hypothetical and uncontrollable stressful situations are described (e.g. “Imagine you are afraid of flying and have to go somewhere by plane”). Each situation is followed by eight alternative ways of dealing with the situation, where four alternatives indicate a monitoring or information seeking strategy (e.g. “I would listen carefully to the engines for unusual noises and would watch the crew to see if their behaviour was out of the ordinary”). The other four alternatives indicate a blunting or information-avoiding strategy (e.g “I would watch the in-flight movie even if I had seen it before”). The respondents are asked to choose

the alternatives they think may apply to them. A total monitoring score, a total blunting score and a summary score can be derived from the scale (Miller, 1987).

Karolinska Scales of Personality (Paper II)

The Karolinska Scales of Personality (KSP) was used to measure different personality traits. The KSP contains 135 items with a four-point response format. The inventory taps different dimensions that represent various personality traits. The anxiety-proneness scales comprise three different dimensions of anxiety, psychic anxiety (e.g. worrying), somatic anxiety (e.g. autonomic disturbances) and muscular tension (e.g. not relaxed). Further anxiety is measured on the psychasthenia scale (e.g. low degree of mental energy) and the lack of assertiveness scale (inability to speak up and assertive oneself in social situations). The extraversion-related scales include impulsiveness (e.g. non-planning), monotony avoidance (e.g. avoiding routine) and detachment (e.g. distance preference in interpersonal relations). The aggression-related scales measure indirect aggression (e.g. slamming doors), verbal aggression (e.g. shouting) and irritability (e.g. lacking patience). The hostility-related subscales include suspicion (e.g. distrusting peoples motives) and guilt (e.g. remorseful). The social desirability scale refers to social conforming, friendly and helpful or “faking good”. The socialization scale taps positive childhood experience and satisfaction with present life situation. High scores on the socialization scale indicate fewer problems whereas high scores on the other scales indicate more problems (Gustavsson, 1997).

Spielberger State and Trait Anxiety Inventory (Paper II)

To measure both trait and state anxiety the Spielberger State and Trait Anxiety Inventory, form Y, was used. The minimum score that can be obtained is 20 whereas the maximum score is 80. High scores on the scales indicate strong anxiety (Spielberger, 1983).

Barnett Scale (Paper II and IV)

The Barnett scale was used to assess the women's and men's marital satisfaction. The scale consists of fifteen items with a five-point scale, with 1 indicating “disagree totally” and 5 “agree totally”. The items tap different aspects of the relationship such as communication, sharing of household tasks, attraction, friendship, love and the sexual relationship. High scores indicate a high degree of satisfaction with the relationship with their partner (Barnett et al., 1993).

Emotional Reaction to Pregnancy Scale (Paper II and III)

Emotional responses to pregnancy were assessed using a scale that was specially constructed for the study, the Emotional Responses to Pregnancy Scale (ERPS). The scale is partly based on the ideas of the questionnaire “Baby schema” developed by Gloer-Tippelt (Gloer-Tippelt, 1991). The responses were recorded on a five-point scale, with 1 indicating disagree totally and 5 agree totally. High scores indicate a high degree of ambivalence toward the pregnancy, difficulty to imagine the pregnancy, anxiety related to pregnancy and anxiety related to the health and normality of the expected baby. All items of the scale and the result of a factor-analysis of the scale that was carried out, are shown in Paper II.

The experience of the pregnancy

The women rated the physical burden of the pregnancy, their body image and whether the discomfort of pregnancy was worthwhile on single items. The

responses were recorded on five-point scales with the end-points from 1= disagree totally to 5=agree totally.

Wikman Scale (Paper III and IV)

The Wikman Attitude Scale was used to assess the women's and the men's attitudes toward pregnancy, parenthood and children. Some of the items are sex-specific, while the majority of the items are common to men and women. The scale has been factor analysed on a sample of randomly chosen women and pregnant women and a sample of randomly chosen men and prospective fathers, in a previous Swedish study. We have employed the same factors that were extracted in that study, in the analyses of the data of this study. The factors are "children mean restriction of freedom", "children mean existential satisfaction", "example of own parents appropriate" and "child's sex is important" for both women and men. For the women there are two additional factors, namely "own bad experience of childhood have a negative bearing on your own desire for children" and "a child is an instrument to confirm yourself and your love relationship" whereas for the men there are two other additional factors. Those are "ambivalence influences contraceptive behavior" and "children mean existential and social advantage" (Wikman, 1994).

Swedish Parenthood Stress Questionnaire (Paper IV)

The Swedish Parenthood Stress Questionnaire (SPSQ) was used to measure stress related to parenthood. The scale has been partly adapted and modelled after the Parenting Stress Index (Abidin, 1990) by Östberg et al. The SPSQ constitutes of the subscales Incompetence, Role restriction, Social Isolation, Spouse relationship problems and Health problems. High scores indicate strong parental stress (Östberg et al., 1997).

3.3.2 Questionnaire (Paper I)

The questionnaire consisted of questions covering the following areas; socio-demographic data such as ages, levels of education, lengths of cohabitation and questions regarding infertility. Further questions were; the couples' social support, who had taken the initiative to treatment; if the relationship had changed by the infertility and a supplementary open ended question where the couples were asked to describe the effect of infertility.

3.3.3 Interviews (Paper II, III and IV)

In pregnancy week 13, the participants were interviewed about their socio-demographic background, such as educational level and duration of cohabitation (Paper II).

In pregnancy week 26, the IVF subjects were asked whether they perceived themselves to be experiencing pregnancy differently compared to couples without previous infertility problems (Paper III).

At two months postpartum, the IVF parents were interviewed regarding their intention to tell their children about the IVF treatment (Paper IV).

At six months postpartum the IVF parents were asked whether they perceived themselves to be experiencing parenthood differently compared to couples without previous infertility problems, and whether they would consider repeating IVF in order

to have another child. Additionally they were interviewed about their current perception of the infertility problem (Paper IV).

The interviews were performed in the couples' homes by a midwife (Hjelmstedt) with a long experience of clinical work with infertile couples. All interviews were conducted separately with the women and the men. The questions were open ended, and the respondents were encouraged to speak freely in order to catch spontaneous associations and thoughts. The interviewer wrote down the answers verbatim during the interviews.

3.3.4 Statistical analyses

The statistical analyses that have been used are t-tests, Chi2-tests, analyses of variance, regressions analyses, factor analyses, and Mann-Whitney U-tests.

3.3.5 Analysis of open-ended question (Paper I)

The couples' written descriptions of effect of infertility were coded into different categories. The purpose was to explore whether other descriptions of effect of infertility not covered in the Infertility Reaction Scale existed.

3.3.6 Analyses of interviews (Paper III and IV)

The first step of the analysis involved repeated reading of all interview transcripts. A categorization of the data in different themes and sub-themes was worked out. The frequencies of statements belonging to each theme were calculated (Morgan, 1993; Patton, 2002; Polit and Hungler, 1995).

3.3.7 Ethical permissions

Ethical approval for Paper I was received from The Local Ethics Committee at Uppsala (reference number 345/95). Ethical approval for Papers II – IV was received from The Regional Ethic Committee at the Karolinska Hospital (reference number 97-084).

4 RESULTS

Gender differences in stress related to infertility among couples seeking IVF or ICSI treatment (*Paper I*)

Infertility Reaction Scale

The total score of the Infertility Reaction Scale (IRS) was higher for the women than the men indicating that the women reacted more strongly to the infertility. The factor analyses showed different patterns between the sexes. The first factor that emerged for the men was “The male role and social pressure” describing feelings of inadequacy of the male role and social pressure to have children. The second factor was “The major focus of life” describing the desire to have a child as a major focus of life. For the women the two first factors were in reversed order compared to those of the men. The first factor that emerged was “The major focus of life” and the second factor was “The female role and social pressure”. The third factor that emerged “Effect on sexual life” was similar for men and women.

Coping

The women received more social support than the men, while there was no significant difference in information seeking coping style between the women and the men. Among the men, an association was found between a high degree of monitoring information seeking coping style and a high degree of infertility distress. (Those labelled as “monitors” choose to cope with a stressful situation by seeking out information.)

Perception of change in relationship to partner

The couples reported that their relationship had improved rather than deteriorated by the infertility as a result of a greater emotional intimacy.

Effect of infertility

The categories that emerged from the qualitative descriptions of effect of infertility, were as follows. *“A feeling of loss of/no control of reproductive capacity”*. The women’s descriptions differed from those of the men, where the women mentioned “the biological clock” as stressful, while the men mentioned “loosing a power of being able to reproduce” as stressful. *“Worry about partners reactions”* was a category only found in the responses from the men. Only the women mentioned *“Jealous of others with children”* while both men and women described *“Feelings of injustice”*. The most frequent category especially among women was *“Mood changes related to infertility”* which included descriptions of periods of depression due to infertility problems. Both men and women claimed that the infertility had lead to *“Personal development and maturity”* and some mentioned *“Acceptance of infertility”*. As the purpose was to explore other descriptions of effect of infertility not covered by the infertility reaction scale, only categories not included in the scale were reported.

Emotional reactions during pregnancy among IVF couples and control couples (*Paper II and III*)

The Karolinska Scales of Personality

The assessment in early pregnancy showed that mean scores for all subscales of the inventory Karolinska Scales of Personality, for all groups were within the normal

range, when compared to normative groups. However, the IVF women had more muscular tension and tended to be more irritable than the control women. The IVF men had more somatic anxiety, indirect aggression, guilt, they were more detached and tended to have more psychic anxiety than the control men.

Emotional Response to Pregnancy Scale

Women

The pattern of *anxiety about loosing the pregnancy* during the pregnancy differed between the IVF women and the control women (Figure 1.). Higher overall anxiety was found among the IVF women. This anxiety decreased as the pregnancy progressed for all women. The decreases of this specific anxiety occurred between pregnancy week 13 and 26 as well as between pregnancy week 13 and 36 while no decrease occurred between pregnancy week 26 and 36. The decrease of anxiety during pregnancy was larger among the IVF women. The *anxiety about the health of the baby* tended to be different between the groups over time, see Figure 2. The observed overall anxiety over the baby not being healthy was lower, although not significantly lower, among the IVF women.

Men

The pattern of *anxiety about loosing the pregnancy* was different between the IVF men and the controls (Figure 1). The overall anxiety was higher among the IVF men. There was a decrease of anxiety as the pregnancy proceeded in both groups. The decreases occurred between pregnancy week 13 and 26 and between pregnancy week 13 and 36 while no decrease occurred between pregnancy week 26 and 36. The decrease was more marked among the IVF men. The pattern of *anxiety about the health of the baby* tended to be different between the groups with the IVF men being non significantly more anxious (Figure 2).

At the assessment in pregnancy week 13, it was found that in all groups there were some subjects who rated high ambivalence about the pregnancy (5 IVF women, 4 control women, 2 IVF men and 2 control men).

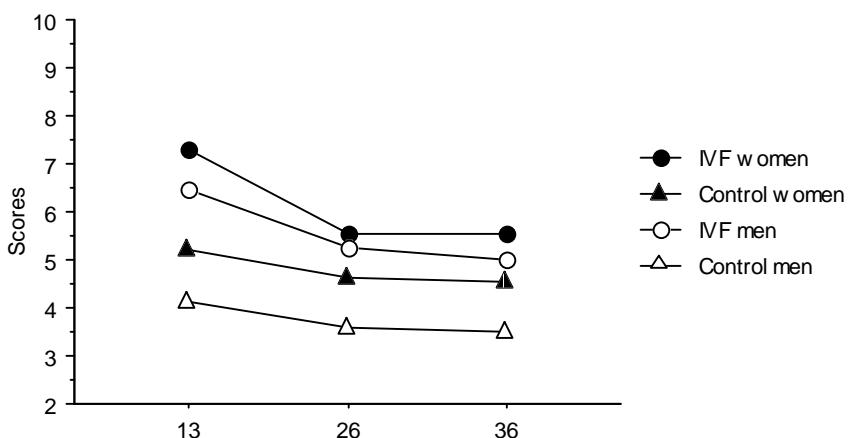


Figure 1. Scores on the scale *Anxiety about loosing the pregnancy* in pregnancy weeks 13, 26 and 36 for the IVF women, the control women, the IVF men and the control men. The minimum score that can be obtained is 2 and the maximum score is 10.

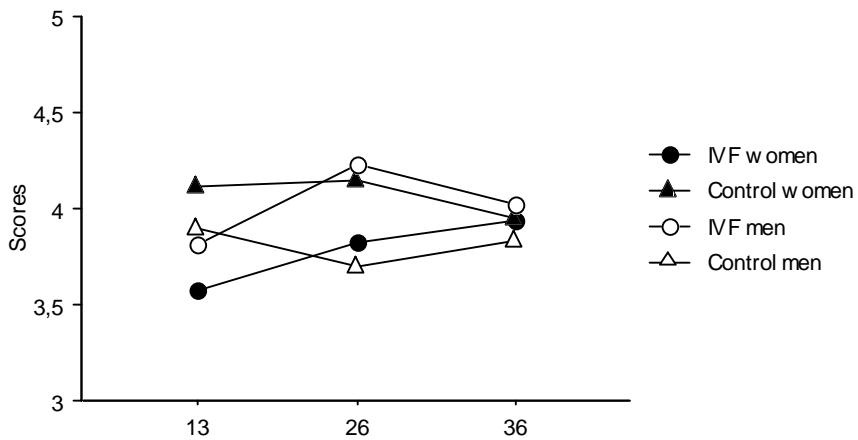


Figure 1. Scores on the scale *Anxiety about the health of the baby* in pregnancy weeks 13, 26 and 36 for the IVF women, the control women, the IVF men and the control men. The minimum score that can be obtained is 1 and the maximum score is 5.

Experience of being pregnant

The IVF women rated that the discomfort of pregnancy was more “worth while” as compared to the control women. Furthermore the IVF women rated to a lesser extent “unpleasant body during pregnancy”, and rated to a lesser extent that it was physically demanding to be pregnant.

Anxiety about the baby during birth

There were no differences between the women in the both groups regarding anxiety whether the baby might be injured during birth. However, the IVF men had more of this specific anxiety compared to the control men.

Associations between recalled infertility distress and pregnancy related anxiety

IVF women

Women with high recalled infertility distress had more *anxiety about loosing the pregnancy* at pregnancy week 13, 26 and 36 and they were more *anxious about the baby not being healthy* at pregnancy week 26 compared to women with low distress. Additionally, they were more *anxious that the baby would be injured at birth* compared to women with low recalled infertility distress.

IVF men

Men with high degree of recalled infertility distress were more *anxious about the baby not being healthy* at pregnancy week 13 and they were more *anxious about loosing the pregnancy* at pregnancy week 26 compared to men with low recalled infertility distress. Additionally, they were more *anxious that the baby would be injured during birth* than men with low recalled infertility distress.

The IVF subjects statements about their pregnancy experience

The analysis of the interviews showed that a majority of both the IVF women (75 %) and the IVF men (66 %) believed that they experienced the pregnancy differently compared to other women and men without previous infertility problems. Below, the themes that emerged in the analysis of the interviews are marked in italics and some of them are exemplified with citations.

Some women thought they were *more anxious than others*. One woman expressed this anxiety in the following way “I am scared to death of loosing him”. Some women stated that *others could just achieve a pregnancy again / probably the only pregnancy that we will achieve* while their situation was different. The citation “Hundred percent of my time I have in mind being pregnant” is one example of how some women described that they had *more focus on and control of the pregnancy*. Compared to others some women also perceived that they *experience the pregnancy more positively* and some expressed that they were *more prepared for pregnancy, parenthood and pregnancy discomfort*. Having gone through IVF treatment had resulted in a feeling of *a longer pregnancy* for some women when comparing themselves to others who were able to conceive without treatment. Some women described that they did *not allow themselves to be happy about the pregnancy / difficulties feeling fulfilled by the pregnancy* which is exemplified by this woman’s statement “I am trying to be happy but I do not want to take anything out in advance”. An example of a statement of those women who believed that there was *no difference* between their experiences of the pregnancy as compared to that of others is “No difference compared to others who also have longed for a child”.

The categories that emerged when analysing the interviews of the men were much the same as those of the women. However, one additional category emerged. Some men described that they were *more emotionally involved in the pregnancy as man*. One man expressed this belief in the following way: “We are closer as a couple – more involved in a completely different way”.

Marital satisfaction during transition to parenthood among IVF couples and control couples (Paper IV)

As can be seen in Figure 3, the women and men in both groups rated a deterioration of marital relationship from pregnancy week 13 to six months postpartum. However no difference between the groups was found. The women rated a more marked decrease of marital satisfaction over time compared to the men, irrespectively of group.

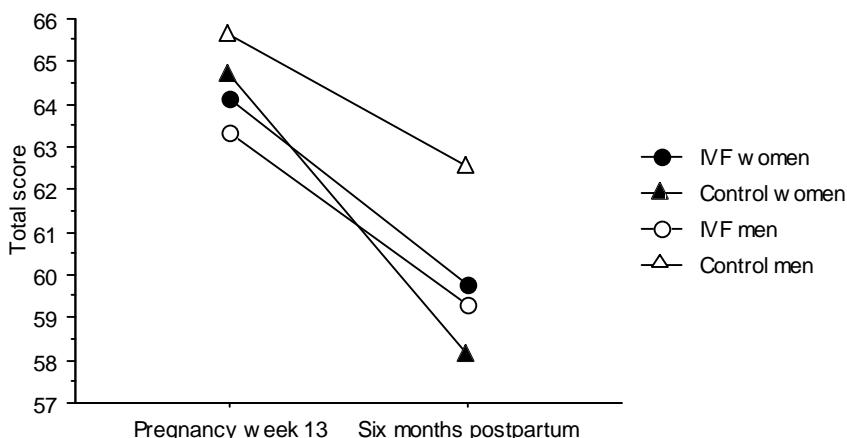


Figure 4. Total score on the Barnett scale (marital satisfaction) for the IVF women, the control women, the IVF men and the control men. The minimum score that can be obtained is 15 and the maximum score is 75.

Attitudes to parenthood and stress related to parenthood among IVF couples and control couples (*Paper III and IV*)

The results of the Wikman attitude scale are shown in Table 3. The IVF women were less concerned about the child's gender than were the control women and they were also less worried about possible "loss of freedom" in their future lives as parents. No differences were found between the two groups of men on either of the scales (Table 4).

Table 3. Subscales of the Wikman Attitude Scale (attitudes to parenthood) for the women who had undergone IVF and the women in the control group, rated in pregnancy week 26

Subscales	IVF women		Control women		Z-value	p-value
	Median	IQR	Median	IQR		
1 Children mean existential satisfaction	29	7	26	5	1.59	n.s.
2 Children mean restriction of freedom	29	6	27	5.25	2.44	<0.01
3 Example of own parents appropriate	9	5	10	6	0.66	n.s.
4 Child's sex is important	10	0	10	3.25	2.15	<0.05
5 Own bad experience of childhood have a negative bearing on your own desire for children	11	3	11	2	0.29	n.s.
6 A child is an instrument to confirm yourself and your love relationship	22	4.5	22	5	0.32	n.s.

Low score - agree, high score – disagree

Minimum scores and maximum scores that can be obtained for subscales 1, 10-50; subscale 2, 7-35; subscale 3, 4-20; subscale 4, 2-10; subscale 5, 3-15; subscale 6, 5-25

Table 4. Subscales of the Wikman Attitude Scale (attitudes to parenthood) for the men who had undergone IVF and the men in the control group, rated in pregnancy week 26

Subscales	IVF men		Control men		Z-value	p-value
	Median	IQR	Median	IQR		
1. Children mean existential satisfaction	28	9.5	28	9	0.17	n.s.
2. Children mean restriction of freedom	37	6.25	35	6.5	1.42	n.s.
3. Example of own parents appropriate	8	6	11	4	1.49	n.s.
4. Child's sex is important	10	2	10	2.25	0.57	n.s.
5. Ambivalence influences contraceptive behavior	8	2.25	8	3	0.36	n.s.
6. Children mean existential and social advantage	12	3.25	11.5	4	0.12	n.s.

Low score - agree, high score – disagree

Minimum scores and maximum scores that can be obtained for subscales 1,10-50; subscale 2, 9-45; subscale 3, 4-20; subscale 4, 2-10; subscale 5, 2-10; subscale 6, 5-25

Swedish Parenthood Scale Questionnaire

There were no differences between either the IVF women and the control women, or between the IVF men and the control men, on the subscales of the Swedish Parenthood Scale Questionnaire. The inventory consists of the following subscales: Incompetence, Role restriction, Social isolation, Spouse relationship problems and Health problems.

Perception of infertility among IVF parents (*Paper IV*)

Parental issues regarding treatment disclosure to their children

A great majority of the IVF parents opted for disclosure about the IVF treatment (women 89%, men 81%). A prominent reason mentioned, was that the child would feel *desired and chosen*. Some of the parents expressed a belief about *the child's right* to learn about the IVF treatment. Another compelling reason for disclosure was that because the IVF treatment was *no secret to others* it was also natural to inform the child. Others stated that they would or probably would inform the child about the treatment, since they consider IVF *accepted in society* as being a common treatment option. Some subjects were convinced they would tell the child, as they said that they felt *no shame* about having undergone treatment. This supports the idea that IVF is a normal procedure, and that it is *of no great concern* for having used the technique.

Those parents who had chosen not to disclose or were uncertain about disclosure (women 11%, men 19%) stated the following reasons. Some subjects were concern *about the child becoming stigmatised* after being informed about the method of conception and a worry of possible negative reactions of others was also expressed. One woman stated that it was *irrelevant to inform the child* about way of conception as this normally is not something parents share with their children. One man had *ethical considerations about IVF* and argued that paying for IVF treatment with public money did not agree with his ethical view. He therefore expressed ambivalence about informing his child.

Parental self-image in relation to IVF

About half of the subjects (women 58%, men 47%) believed that they experienced parenthood differently compared to other parents. Some believed that they had *stronger feelings* toward their infants. Another difference pointed out compared to non-IVF parents, was that they had a *higher tolerance* for child difficulties. A number of the subjects believed that they were *more grateful* about parenthood than other mothers and fathers. Some men described themselves as being *emotionally closer as fathers* as compared to non-IVF fathers and they expressed a strong intimacy with their partner due to their previous infertility. Other subjects believed that they were *more worried* as parents since the child probably would be their only offspring. In contrast, one woman felt she was *more relaxed* as a parent compared to non-IVF parents.

The remainder of the parents (women 42%, men 53%) believed they shared similar experiences with other parents. They regarded *the love for a child as something common to all parents*.

Willingness to undergo additional treatment

The results of the analysis of the subjects' attitudes about future IVF treatment showed that 51% of the women and 64% of the men would consider repeating IVF. Some assessed *treatment distress as worthwhile* while others assumed that *to repeat IVF would be their only option in order to have another child*.

The most salient reason given for uncertainty or unwillingness about repeating IVF (women 49%, men 36%) was that the previous IVF treatments had been *emotionally or physically demanding*, and therefore, they did not want to expose themselves to further treatment stress. Some feared possible disappointment about treatment failure.

A few men were doubtful, as they believed the treatment had been far too demanding for their partner. Other subjects stated *economic reasons* for not undergoing another treatment. Some subjects mentioned *adoption* as a possible alternative in the future instead of another IVF treatment.

The impact of the infertility experience post successful treatment

Some subjects described the current impact of infertility in their lives. The most salient description among both women (27/45, 60%) and men (35/43, 81%) was that infertility had a *low emotional impact in their lives*. Some women and men described different strategies of coping with infertility, such as an acceptance of the problem, taking problems as they come and refraining from thinking back on infertility. Some voices: “We accept our fate. We do not want to start a new round of treatments.” and “I think that it has not happened, that we have not undergone IVF. I never think back about the IVF conception. I have left it behind me”.

In contrast, three women described that the infertility still had a *strong negative emotional impact* in their lives, as represented by these quotes: “I am still infertile. I still feel a desperate injustice. What is the meaning of this?” and “I feel that I can get angry and mad about it. I still have the same feelings about infertility as I had before.”

Other subjects described that the infertility had an *occasional emotional impact* (15/45 women, 33%; 8/43 men, 19%). One woman described how having her period triggered her emotions related to her previous infertility: “I had my period a week ago. I had a lot of thoughts. I was reminded of all disappointments earlier when having my period, but I was not unhappy because I was not pregnant now.” Some women and men were still thinking about what had caused the infertility problem.

Some subjects saw different solutions of the infertility problem. Some subjects expressed that infertility was a problem if they wanted more children and some of those perceived infertility as a problem that *technically can be solved*. A number of both women and men expressed a type of *wishful thinking about a solution*, hoping the infertility problem would be solved. One man said “The only thing I think about now is that nature will play a trick and it will work without a problem.” Some subjects thought that psychological factors could have caused or contributed to their infertility problem and that there would be a *psychological solution*. This was the case for subjects both with unexplained, female, male and combined causes of infertility. One statement exemplifying this theme is as follows: “I believe that I can have a biological child now. I think that there was a psychological reason for us, not having a child before. There is not as much pressure now, so it may work.”

5 DISCUSSION

Gender differences

Among couples seeking IVF or ICSI treatment we found sex differences in psychological reactions to infertility. The most important aspect of infertility for the women was the intense desire to have a child, whereas for the men the obligation of fulfilling the male role and the social pressure of becoming a parent were the most central themes. The total Infertility Reaction Scale score was significantly different between the sexes indicating that the women reacted more strongly to infertility, which is supported by other research (Andrews et al., 1991; Collins et al., 1992). Additionally, Collins and Frankenhauser have found gender differences in stress reactions (Collins, 1985; Frankenhauser et al., 1978). Women express subjective reactions to stress but their levels of stress hormones tend to be low whereas men do not report subjective stress but they display greater hormonal reactivity compared to women (Collins, 1985; Frankenhauser et al., 1978). The men, but not the women in our study mentioned a worry about their partner's reactions to infertility. Wirtberg found that men first respond to their partner's emotions about infertility rather than considering their own feelings (Wirtberg, 1992). It is likely that the role of supporting the woman while at the same time struggling with their own infertility distress is extremely demanding for men. Therefore, it would be interesting to study whether there are gender differences in stress hormone reactivity among couples seeking IVF treatment.

We found no differences in information seeking coping style between the women and the men who opted for IVF. In contrast, the women were more likely than men to seek social support and talk about infertility problems. In general it has been found that when confronted with a stressor, women seek social support to a greater extent than do men. If no social support is available women as compared to men may be more negatively affected. Also, women provide more social support and are therefore likely to be more exposed to life crises of other people (Belle, 1987). Nearly half of the men in our study had not confided in anyone about their infertility problems. A French study reported that three-quarters or more of both men and women informed parents and friends of the IVF-treatment (Laffont and Edelmann, 1994). An American study reported that about 80 percent of the men had confided in others about their infertility problems (Collins et al., 1992). This may indicate that an avoidance to seek social support is even more pronounced among Swedish men. However, we do not know if an expanded social network or sharing their worries with others would help men to better cope with infertility. Jordan and Revenson have carried out a meta-analysis of studies published between 1966-1995, examining gender differences in coping with infertility. All studies have employed the Ways of Coping Questionnaire, which has been developed by Folkman and Lazarus. They found that women use the strategies of seeking social support more than men, which is in accordance with our findings. Furthermore, they found that women used escape-avoidance (i.e., hoping a miracle will happen), planful problem solving (i.e., making a plan of action and follow it) and positive reappraisal (i.e., trying to find new faith) to a greater degree than their partners. No gender differences in coping were found for confrontational (i.e., expressing anger), distancing (i.e., trying to forget), self-controlling (i.e., trying to keep feelings to oneself) or accepting responsibility (i.e., criticizing or lecturing oneself) strategies. (Jordan and Revenson, 1999).

Our results indicate that gender may affect how infertility is perceived and how coping strategies are chosen when dealing with infertility distress. Barnett et al. give the following suggestion to gender differences in stress process: "The effects of biological sex are mediated through the psychological and social consequences of being male or female" (Barnett et al., 1987, p 350). Thus, being male or female has an impact on whether or not a situation will be perceived as stressful and subsequent coping resources to deal with the stress. Because of their traditional roles, women and men encounter different forms of stress and because of traditional roles they have also developed different coping strategies (Barnett and Baruch, 1987).

Furthermore, we found that the couples in our study reported that the relationship had improved rather than deteriorated as a result of their infertility, which supports the findings of other studies showing that couples in this stage are well adjusted in their marital relationship (Dennerstein and Morse, 1985; Hearn et al., 1987; Leiblum et al., 1987). It has been speculated whether couples overestimate their relationship when they seek IVF treatment (Dennerstein and Morse, 1985; Leiblum et al., 1987). Alternatively, they may have reached a stage in their infertility process where they have worked through periods of emotional and marital problems (Hearn et al., 1987).

Emotional reactions

We found, that mean scores for all subscales of the Karolinska Scales of Personality inventory, for all the subjects in both the IVF group (those having achieved a pregnancy via IVF) and the control group (those having achieved a pregnancy without assisted reproductive technology), were within the normal range when compared to normative groups. However, when comparing the IVF couples with the controls, we found that the IVF women had more muscular tension and tended to be more irritable compared to the control women. The IVF men had more somatic anxiety, more indirect aggression and more feelings of guilt, they were more detached and tended to have more psychic anxiety than the control men. Greil concluded in a review article that most studies have found no differences in personality profiles between infertile and fertile women and men (Greil, 1997). On the other hand, there are studies that have found infertile women to report more suspicion, hostility (Csemiczky et al., 2000), tension, introversion, anxiety (Fassino et al., 2002b; O'Moore et al., 1983), and guilt (Csemiczky et al., 2000; O'Moore et al., 1983), less cooperativeness (Fassino et al., 2002a) and less angry temperament (Fassino et al., 2002b), as compared to fertile women. Fassino also found higher levels of anxiety among infertile men and both infertile men and women rated higher levels of depression as compared to controls (Fassino et al., 2002b; O'Moore et al., 1983). Also, Berg and Wilson described an "infertility strain profile" characterized by tension, depression and worry among infertile couples (Berg and Wilson, 1990). The ratings of the KSP are assumed to be stable during life but previous studies have shown that some of the subscales fluctuate during e.g. pregnancy and lactation (Nissen et al., 1998; Sjögren et al., 2000). One might speculate whether the findings of the present study with the IVF subjects rating higher on anxiety-, aggression-, hostility- and detachment dimensions reflect a reaction to their previous infertility or whether they are indicative of underlying personality traits.

At the assessment in early pregnancy, it was also found that the mean scores for ambivalence about the pregnancy were low in all groups. However, there were a small number of both women and men in the IVF group and the control group who had strong ambivalence toward the pregnancy. Ambivalent feelings in early pregnancy are considered to be normal even if the pregnancy is planned and desired

(Niemilä, 1992a; Raphael-Leff, 2001). One woman in the present study stated: "I said that I was depressed but the doctor said, 'You do not have a reason for being sad'" (results of interviews of this project that have not yet been published).

We found, that among the women, the pattern of anxiety about loosing the pregnancy was different between the IVF group and the control group (see Figure 1). The overall anxiety of the IVF women was higher and the decrease of their anxiety was more pronounced compared to controls. Klock and Greenfeld found no differences between IVF women as compared to controls on global anxiety, but they found that the ratings of the IVF women decreased as the pregnancy progressed (Klock and Greenfeld, 2000). In agreement with our results, Mc Mahon et al. found higher levels of anxiety about pregnancy loss at pregnancy week 30 among IVF women compared to controls (McMahon et al., 1997a) and high retrospective pregnancy related stress ratings have been found among women who have got their children after assisted reproductive technology (Braverman et al., 1998; van Balen et al., 1996). The pattern of anxiety about the health of the baby during the pregnancy tended to be dissimilar between the two groups of women in our study (see Figure 2). When comparing the ratings in pregnancy week 13 with the ratings in week 36 among the IVF women separately, it was found that the level of anxiety increased while no such increase occurred among the controls. In pregnancy week 36 the IVF women's degree of anxiety about the health of the baby was at the same level as that of the control women. Parallel to the increase of anxiety related to the health of the baby there was a more pronounced decrease of anxiety about loosing the pregnancy between pregnancy week 13 and 36 among the IVF women. It seems that IVF women do not start to worry about the baby until they feel secure that the pregnancy will proceed. Thus, the patterns of pregnancy related anxiety among IVF women may reflect a delay in bonding. McMahon et al showed that IVF women were more anxious about the well being of the baby in pregnancy week 30 (McMahon et al., 1997a). It seems that pregnancy related anxiety, needs to be studied at shorter intervals in order to examine the changes during pregnancy more closely.

Among the men, we found that the pattern of anxiety about loosing the pregnancy was different between the IVF men and controls (see Figure 1). The IVF men's overall anxiety were higher compared to the controls and their decrease of anxiety over time was more prominent. The results are similar to previous retrospective findings (Braverman et al., 1998; van Balen et al., 1996). The pattern of anxiety about the health of the baby tended to be different between the groups (see Figure 2). When analysing the IVF men separately, we found that their anxiety increased from pregnancy week 13 to 26.

Another finding of the study was that the IVF men were more anxious whether the baby might be injured during birth, but such a difference was not found between the IVF women and the controls. It is possible that IVF men are more focused on the result of the pregnancy, a baby, while IVF women are more focused on the pregnancy. Contrary to our results, McMahon et al. found that the IVF women in their study were more anxious about the baby's safety during birth (McMahon et al., 1997a). Thus, this topic needs to be studied further.

Among both the IVF women and the IVF men, we found associations between a high degree of previous infertility distress and high levels of pregnancy related anxiety. Such associations were found at pregnancy week 13, 26 and 36. These findings, suggest that IVF couples who have a strong negative infertility experience do not forget completely their worries and leave their anxieties behind them once they are pregnant.

Interestingly, the IVF women of this study assessed pregnancy discomfort in a more positive way than the controls. May be IVF women are more prepared to accept and cope with problems during pregnancy after a history of infertility and a long period of a wishing for a child. It could also be that they idealize pregnancy and tend to deny problems. Infertility can be accompanied by an impaired body image which may persist during the entire pregnancy (Bernstein et al., 1988) and Bernstein et al. found that previously infertile women were likely to use negative words to describe their pregnant body (Bernstein et al., 1994). In contrast, the present study showed that the IVF women were less negative about their pregnant body.

Furthermore, the study showed that the IVF women were less likely to rate that having children means restriction of freedom. It is possible that IVF women are more prepared to renounce their freedom. Conversely, they may have unrealistic expectations about parenthood. Further, a gender preference was less articulated among the IVF women. It is also possible that the main goal for the IVF women was simply to have a baby and that the sex of the expected child was of less importance. No differences were found regarding expectations and attitudes about pregnancy, children and parenthood between the men in the two groups.

Parenthood

We found no differences in parental stress between the parents who had had their children via IVF and the parents with “naturally conceived” children. The results of this study are both in line with some previous findings (Colpin and Soenen, 2002; Gibson et al., 2000) and also contrary to other results that have found ART parents to rate less stress (Golombok et al., 1995).

Some IVF fathers in the present study believed they were more involved with their child and family than non-IVF fathers as a consequence of having shared problems of infertility together with their partner. Golombok et al found that ART fathers interacted more with their child and were more involved in parenting than others as assessed by their partner (Golombok et al., 1996). Different results concerning parental competence have been found previously. One study found IVF mothers to rate more parental competence compared to controls (van Balen, 1996) while another study showed a tendency of the contrary (Gibson et al., 2000) Lower scores of maternal self-efficacy among IVF mothers has also been reported (McMahon et al., 1997b). No differences between IVF fathers and controls regarding parental competence were found (Gibson et al., 2000; van Balen, 1996).

It could be expected that all couples in this study would inform the child about the treatment as their own gametes were used in the IVF procedure. However, quite a number of subjects seemed to be concerned about the reactions of their child about IVF treatment per se, or worried about negative attitudes toward ART among others. This is in line with findings by Colpin et al. showing that the great majority but not all parents who had undergone homologous IVF intended to inform their children about the treatment (Colpin and Soenen, 2002). According to Brewayes et al, it is not having used the IVF technique that prevents parents from telling their children about

way of conception, what is important for a decision of non-disclosure is having used donated gametes (Brewaeys et al., 1997). In the present study some IVF parents thought it to be irrelevant to give too much weight to the method of conception. The great majority of the couples opted for disclosure about the treatment. Some subjects had also kept mementos of the IVF treatment as a proof of the child's uniqueness.

The subjects in the present study mentioned that one motive for disclosure about IVF was that the child would feel appreciated and desired. Gibson et al found that IVF mothers rated their children as being more vulnerable and special than control mothers (Gibson et al., 2000). Moreover, it has been found that ART mothers report higher emotional involvement with their child compared to controls (Golombok et al., 1996; van Balen, 1996), but no differences have been found regarding IVF fathers' and control fathers' feelings for their children (van Balen, 1996; Gibson et al., 2000). Whether the view of the offspring as being a precious gift and extremely desired has negative or positive consequences is unclear. More over protectiveness among IVF women compared to controls, was found in one study (Weaver et al., 1993), whereas in another study IVF mothers were not observed to be more overprotective, although the mothers themselves reported more protectiveness (Hahn and DiPietro, 2001). Gibson did not find more protectiveness among IVF mothers (Gibson et al., 2000).

The above-cited studies on adaptation to parenthood have been conducted at diverse ages of the children (4 months to 8 years). Longitudinal studies are needed to get a deeper understanding whether there are certain periods during IVF children's early lives, where their mothers and fathers need support in parenting.

Marital satisfaction

The women and men in both the IVF group and the control group of this study reported decreased satisfaction with marital relationship from early pregnancy to six months postpartum suggesting that having experienced infertility does not buffer against marital conflicts during early transition to parenthood. Other studies have also found this period in life to be vulnerable for many couples (Belsky and Rovine, 1990; Cox et al., 1999; Tomlinson, 1987a). However, the results of this study did not correspond to the results described by Sydsjö et al. (Sydsjö et al., 2002). They found that the marital relationship was stable among IVF couples while parents with naturally conceived children rated decreased satisfaction from pregnancy to one year postpartum. It may be that the parents in that study had one-year-old children (Sydsjö et al., 2002) and the assessment in the present study were performed at six months postpartum.

Both groups of women in this study reported a more dramatic decline of satisfaction with the relationship compared to their partners, a gender difference that also has been found previously (Belsky and Rovine, 1990). It may be speculated though, whether the gender difference found in the present study would diminish if repeated assessments would be performed later on, as it has previously been found that the largest decline in partner satisfaction occurs for women between pregnancy and six months postpartum whereas the largest decline for men occurs between six months postpartum and 18 months postpartum (Cowan et al., 1985). Additional research is needed, to obtain a more complete picture of the pattern of the marital relationship during IVF parents' transition to parenthood.

Perception of infertility

The IVF parents in the study described different ways of coping with infertility in their current lives. Some of them stated that they had come to accept having infertility problems, which can be regarded as an adaptive way of coping. Others mentioned that they refrained from thinking back on infertility and the IVF treatment. It may be disputed whether this strategy is adaptive or maladaptive. They may have decided, cognitively, to leave the infertility experience behind them. Most likely, they avoid a problem that is too painful to be reminded of and this strategy reflects a defence against anxiety.

We also found that some couples in our study believed that psychological factors had caused or contributed to the infertility problem. This belief is in accordance with the stress hypothesis model, which proposes that stress can contribute to difficulties in conceiving. Some of the IVF parents expressed magical thinking and wishfully believed that they no longer would need ART in order to conceive. This strategy can be interpreted as a possible denial of having fertility problems. It has been argued that denial of a threat is not necessarily maladaptive, as it can provide a break from negative feelings associated with a threat that is uncontrollable (Moos and Schaeffer, 1986). Further studies are needed to examine more closely coping styles and their consequences for the psychological well being of IVF parents.

The study showed, that about half of the women and one third of the men were uncertain about going through a new treatment despite the fact that their previous treatment had been successful. Psychological and physical strain related to treatment was stated as the main reason. The relatively high proportion of women who were reluctant to start a new IVF may be explained by the fact that the previous treatment was recent. Braverman et al. reported that a proportion of 31 % of parents with older children were unwilling to use ART again (Braverman et al., 1998). Hammarberg et al. found that a majority of both women who had and those who had not succeeded with ART, retrospectively stated that counselling should be offered during treatment (Hammarberg et al., 2001), indicating that even if treatment results in a child, the infertility is recalled as psychologically demanding.

Some subjects described how certain situations were triggers of previously experienced infertility distress. Others said that unanswered questions about the cause of infertility sometimes crossed their minds. A few of the IVF women expressed intense negative emotions related to infertility describing that the infertility still played a considerable role in their lives. These results demonstrate that for quite a few subjects, negative feelings related to infertility are not easily overcome although parenthood is achieved. It is possible that the inability to conceive naturally and being dependent on treatment options may be experienced for some women and men, as deleterious to their self-image and continues to take its toll for a long time.

6 SUGGESTIONS FOR CLINICAL PRACTICE

Midwives are encountered during the journey an infertile couple makes, beginning with seeking IVF treatment, being pregnant after successful treatment, giving birth, and taking care of a newborn. In Sweden, the care of couples during IVF treatment, is primarily given by midwives, whose role is to inform the couples about the treatment procedure, to instruct them about how to follow the medical regiments, to inform them about the progress of the hormonal stimulation, and to assist them when the oocytes are retrieved and when embryos are transferred. Subsequent to the IVF treatment, a midwife is usually the first person at the clinic the couple speaks with after they have learned of a positive result on a pregnancy test. The woman then undergoes one or several ultrasound examinations in order to confirm fetal viability. By that time, the woman has reached six to nine weeks of pregnancy. Subsequently, the couple is referred to an antenatal care clinic, and about three to six weeks later they make their first visit. If the pregnancy is uncomplicated, the women consult for the most part a midwife during pregnancy, and are then assisted by a midwife when they give birth. During the near postpartum period, a midwife normally cares for the mother and her newborn. Midwives therefore play a key role in providing quality care for this population. Below I will present reflections about our findings and suggestions about how our results can be implemented.

Among couples seeking IVF treatment, we found that the women reacted more strongly to their infertility than the men, and they also maintained an intense desire to have a child despite not being able. Women also received more social support than their partners. Conversely, men generally saw the central aspects of infertility as being tied to filling a male role, as well as to filling a social role to become a parent. These differences in perspective are important since it has been generally emphasized in clinical work that the infertile couples should be considered as a unit, with infertility being a shared problem. Our results, however, show that it is reasonable for the IVF team to also consider the woman and the man separately, giving special weight to perceived differences and to coping strategies based upon gender in response to infertility distress.

While it is considered normal to be anxious during pregnancy, our study showed that IVF couples have elevated levels of anxiety about losing the pregnancy that persist through the entire pregnancy. This was particularly true for IVF subjects who had previously experienced high infertility distress. We found that IVF women had more muscular tension and tended to be more irritable compared to the control women. The IVF men had more somatic anxiety, more indirect aggression and more feelings of guilt, they were more detached and tended to have more psychic anxiety than the control men. We do not know whether these findings are due to differences in personality traits between the groups or whether the findings reflect a reaction to the IVF subjects' previous infertility even if personality traits are presumed to be stable during life. These findings suggest that health care providers cannot expect IVF couples who have a strong negative infertility experience, to forget completely their worries and leave their anxieties behind them once they are pregnant. It is of clinical significance to acknowledge these feelings in a professional way.

It is also important in the first place for the IVF team to have a professional stance when discussing a positive pregnancy test and to wait for the reactions of the subjects, instead of overwhelming the couples with enthusiasm over a successful treatment,

which may impede IVF couples to express possible ambivalence. To feel ambivalence is normal for parents in general and Niemilä found, that an intervention group of pregnant women who had the opportunity to reveal ambivalent feelings during pregnancy experienced motherhood in a more positive way and responded faster to the needs of their babies than controls (Niemilä, 1992b).

Moreover, it has been found that pregnant women who received additional social support by midwives, reported better psychosocial health, better physical health for themselves and their babies and they used less health services than controls, in the early weeks postpartum. Furthermore, the intervention group (those having received additional social support) was less worried about their babies (Oakley et al., 1990). Seven years later positive effects were found in favour of the intervention group (Oakley et al., 1996). Conversely, however, it has been suggested that too much social support can lead to dependency (Downe, 1997; Wheatley, 1998). During the infertility investigation and IVF treatment, infertile couples have often been for a long time in the hands of medical experts and they may have developed a strong dependence on them. It is therefore a challenging task for midwives to give adequate social support to IVF couples in a way that balances an acknowledgment of their anxiety with normalizing the pregnancy.

Of particular interest in our study, the IVF women assessed pregnancy discomfort in a more positive way and they had more positive expectations about parenthood than controls. Perhaps IVF women are more prepared to accept and cope with problems during pregnancy after a history of infertility and a long period of a wishing for a child. On the other hand, it could also be that they idealize pregnancy and parenthood and tend to deny problems. In either case, it is important for midwives to be sensitive to IVF couples' needs and to listen carefully to their thoughts and feelings, while making it clear that it is normal for them to feel ambivalence over future parenthood and to have negative feelings about pregnancy discomfort.

Given these findings, stress management may be beneficial in order to help IVF couples lower their tension during pregnancy. Since IVF pregnant couples share the same source of stress, group programs may be beneficial for the exchange of knowledge, skills and experiences. However, it is likely that not all couples are interested in participating in a group program, and therefore, individual counselling for the couple or for the woman and man separately should be offered. Various kinds of psychological support should be offered to the couples and the support should be easily accessible.

Our findings suggest that IVF men might have increased anxiety about the welfare of the baby during birth. The staff assisting IVF couples during birth should take into consideration, a possible strong anxiety among IVF fathers. To attempt to lower anxiety, the staff should inform the fathers about the state of the baby and the progress of the delivery. The information should be explicit in order to avoid misunderstandings.

The IVF parents did not differ from the control parents with regard to parental stress even though the IVF parents had been more anxious about losing the pregnancy. Other studies support this finding (Colpin and Soenen, 2002; Gibson et al., 2000). In fact, lower levels of parental stress have been found among parents with children who were conceived via assisted reproductive technology (Golombok et al., 1995).

We found that the women and the men among both the IVF parents and the control parents in our study experienced deterioration in the partner relationship from early pregnancy to six months postpartum. IVF couples may be expecting that there their lives will be free of problems once they have had a child and they may be unprepared for relational difficulties. It is therefore important for health care providers to be aware of these factors and to be aware of the couples' needs when discussing these matters.

Our results further demonstrated that about half of the women and one third of the men were uncertain about going through a new treatment despite the fact that their previous treatment had been successful. Psychological and physical strain related to treatment was stated as the main reasons. In fact, for quite a few subjects, negative feelings related to infertility were not easily overcome although parenthood was achieved. It is possible that the inability to conceive naturally and being dependent on treatment options may have been experienced for some women and men as deleterious to their self-image. IVF parents may therefore benefit from counselling with regard to the potential long-term impacts of infertility.

Concerning the care of couples at the IVF-clinics, they should be offered an appointment with a midwife in order to discuss their feelings about the pregnancy and to receive health related advice. Such a routine is successfully practised in some American IVF-clinics. Of particular interest, some of the couples in the present study described that they were in a state of "limbo" during the interval between having left the IVF clinic and before entering the antenatal clinic (results of interviews of this project that have not yet been published). This finding suggests that IVF couples with strong anxiety should be offered extra appointments or telephone contacts with the IVF midwife prior to entering the antenatal clinic. Alternatively, it should be considered to schedule earlier contact with the antenatal clinic.

Continuity of carer is a policy that has been discussed when organizing maternal health care. One could speculate whether it would be beneficial for the IVF couples if the IVF clinic midwife would continue to care for them during the entire pregnancy. Such a strategy would have pros and cons, in that an obvious benefit would be the established relationship and familiarity that the midwife already has built up with the couple. A disadvantage may be that it is subsequently difficult for the couples to shift from "a medical paradigm of infertility treatment" to "a normal paradigm of pregnancy".

However, the advantages of continuity of carer became obvious for me when working in the present research project as I had the opportunity to meet with parents from early pregnancy to six months postpartum. This gave me insight into the value of following couples during their transition to parenthood, and I was able to obtain an understanding of how the triad of mother, father and child function. Midwives have the responsibility for the care of mothers and newborn infants during the near postpartum period (Socialstyrelsen, 1995). Subsequently, a nurse at the Well Baby clinic is responsible for the care of the family. An organizational strategy where midwives and nurses work together and place emphasis on overlapping the antenatal health care and the child health care would probably be beneficial for families.

The positive effects of posing questions became apparent to me when conducting the interviews in this research project, since the couples started to reflect and to verbalize their thoughts and expectations about parenthood. The care given by the midwife

shall, according to the Swedish national guidelines, also include psychosocial aspects, in addition to health promotion and the medical surveillance of mother and fetus. Parents-to-be shall also be given an opportunity to prepare for future parenthood (Socialstyrelsen, 1996). In Sweden, this preparation is offered in different ways, though mainly in parental groups and sometimes as lectures. Allowing parents in general, an opportunity to express expectations about their future life with children may be a more effective strategy for support during their parenthood, instead of presenting a ready made model as is common in the present system. Oakley shows that parents appreciate a midwife who is a good listener (Oakley et al., 1990).

Knowledge about infertility and infertility treatment and its emotional consequences should be integrated into current midwifery programs. As new assisted reproductive methods continue to develop, it is of importance for midwives to continuously search new knowledge about the psychosocial consequences of these methods, in order to ensure the provision of quality care for this population.

7 CONCLUSIONS

The results of the present studies indicate that:

- Among couples seeking IVF treatment, women report stronger stress related to infertility than men, and they also feel an intense desire to have a child. They also receive more social support than their partners, who experience the fulfilment of the male role as well as the social role to become a parent as the most central aspect of infertility.
- Women having achieved a pregnancy via IVF (IVF women) have more muscular tension and tend to be more irritable compared to women who have achieved a pregnancy without assisted reproductive technology (control women).
- Men, whose partner have achieved a pregnancy via IVF (IVF men) have more somatic anxiety, indirect aggression, feelings of guilt, more detachment and they tend to have more psychic anxiety than men, whose partner have achieved a pregnancy without assisted reproductive technology (control men).
- Anxiety about loosing the pregnancy is stronger among IVF women and IVF men from early to late pregnancy as compared to control women and control men.
- IVF women are less concerned about physical discomfort during pregnancy and about the child's gender than control women and they are also less worried about possible "loss of freedom" in their future lives as parents.
- IVF men are more anxious that the baby may be injured during birth as compared to control men.
- There are associations between high degree of previous infertility distress and high levels of pregnancy related anxiety among IVF women and IVF men.
- Levels of parental stress among IVF parents are equal to those of control parents.
- Satisfaction with the marital relationship during transition to parenthood is comparable among IVF parents and control parents, with a decline from early pregnancy to six months postpartum.
- Negative feelings related to infertility are not easily overcome even though an IVF treatment is successful and parenthood achieved. The inability to conceive naturally continues to affect the emotions of a proportion of IVF parents.

The results showed that gender may affect how infertility is perceived and how coping strategies are chosen when dealing with infertility distress. Concerning strategies for antenatal care, it is important to pay attention to an elevated anxiety level among IVF couples that should be acknowledged while also lending support to normalize the pregnancy. In addition, it is essential to give them extra time to discuss pregnancy experiences and their future life as parents. It seems that the inability to conceive naturally continues to affect the emotions of a proportion of IVF parents even if pregnancy is achieved and a child is born. The results suggest that IVF parents may benefit from counselling with regard to the potential long-term impacts of infertility.

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