Differences in female and male perception of information and decision-making in single-embryo transfer in in vitro fertilization in Sweden

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Abstract

Purpose The aim of this study was to evaluate the information and the factors that contribute to the decision to accept and choose single embryo transfer (SET) in females and males.

Materials and methods Fifty-four females and males undergoing SET were interviewed separately using a structured questionnaire.

Results The women were significantly more satisfied with the information than the men (odds ratio 3.3), but the decision to accept SET was nevertheless more difficult for women (OR 3.1). Only one-third of both female and males were aware of the increased maternal risks with twin pregnancies. There was a tendency that the women who accepted SET had previous children, shorter duration of infertility, and were younger. Cryopreservation of embryos and a good pregnancy chance were important irrespective of gender.

Conclusion The female needs more support to choose SET. The male needs better information and further involvement

in decision-making. The females were more aware of the fetal risks, but the awareness of the increased maternal risks with twin pregnancies was low.

Keywords In vitro fertilization · Gender · Decision-making · Single embryo transfer

Introduction

One of the main problems in in vitro fertilization (IVF) is the high frequency of multiple pregnancies, and the subsequent high frequency of neonatal problems and sequelae for twins/triplets [1]. From a medical point of view it is unacceptable with twin rates reaching 25 to 40% in IVF pregnancies. Being a twin poses risks during pregnancy such as premature delivery and being born small for gestational age (SGA). An increased risk for neurological sequelae in children born after IVF has been found mainly due to the frequency of twins [2]. Maternal complications, such as pre-eclampsia, are also increased in twin pregnancies [3]. These are reasons why the discussion on “towards a single embryo transfer” has been raised during recent years [4].

Like in most medical situations it is important that the patient is involved in the decision-making. Infertile women are known to have a high percentage of psychological problems, ranging from 25 to 60% [5]. In IVF, males seem to have less, but still increased, frequency of psychological problems, as compared to a normal population [6]. Before treatment anxiety is as the main psychological manifestation, related to the stressful nature of IVF and the fear of failure [7]. On the other hand, other researchers found that couples entering an IVF-programme were, in general, psychologically well adjusted, irrespective of their fertility history, and duration of infertility [8, 9].

The female need more support to accept and choose single embryo transfer, compared to the male and information should in some areas be directed differently to females and males.

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Involvement of both the female and the male in the decision-making concerning IVF procedures is important. Both are generally young and healthy, and have as a rule been childless for a long time. They have a good medical knowledge about infertility and a mutual decision to have a child. In many instances they are personally responsible for the expenses. Psychologically stressful situations may, however, deteriorate decision-making [10]. It is therefore of outmost importance to evaluate how the female and the male are influenced by the recommendations in IVF concerning single embryo transfer. The question is controversial. Several studies [11–13] have found that both women and men undergoing IVF often have a great desire to have twins.

The global trend in IVF is to recommend couples to have single embryo transfer, in relatively young females, with several high-quality embryos, performing their first IVF cycle, and where there is ability to freeze spare embryos. This might contradict the couple's wishes. It is of great importance to clarify which factors that influence the decision to transfer one embryo after information and recommendation from the medical profession.

Gender differences, such as psychological well-being, have been found in infertility patients, undergoing different treatments [14]. It might be necessary for the medical profession to target information specifically for females and males. In Sweden, the midwife has an important role in providing the IVF patient with information. The aim of this study was to evaluate the information and the factors that contribute to the decision to accept and choose single embryo transfer in females, as compared to males.

Materials and methods

Between November 2002 and March 2003, 160 couples undergoing IVF were asked to participate in the study. There was no patient selection based on the number of previous IVF cycles. Each day the first consecutive two couples attending the IVF unit for embryo transfer were asked to participate in the study. The remaining couples during the same day were not asked or included in the study. One hundred and forty-two were enrolled in the study and the remaining 18 couples (11.3%) declined to participate, in general because of lack of time. From the 142 couples in the study population, five women and five men were excluded as they stated that they did not participate in the decision of transferring one embryo or more. A total of 137 females and 137 males were thus available for analysis, giving a total number of 46 (14.4%) patients that were excluded from the analysis. Fifty-four (39.4%) couples chose single-embryo transfer. These 54 couples are the subjects for the present study.

At attendance to the IVF clinic for initial consultation the couple met both the midwife and the physician. They received oral and written information about the entire IVF procedure. In addition to the physician, the midwife had a vital role in informing and supporting the couples. Thereafter the couple had a meeting with the responsible physician for further clarification of the medical care, pharmaceutical treatment, the ordination of the gonadotropin stimulation, and the necessary examinations. Further information was given by the physician, emphasizing the success rate and the risks with multiple pregnancies. The patients often spontaneously asked about how many embryos that would be transferred and it was stressed that the couple should be involved in the choice, although in the end it was the physician who must decide. The latter meeting lasted for 1 to 2 h.

During the IVF treatment the midwife was available for answering questions and, when needed, giving emotional support usually by telephone, or directly at the IVF ward. The patients had in general questions concerning the practical aspects of how the treatment would proceed, questions about the different drugs and their side effects. Often, the patients needed emotional support, someone who could listen and understand their situation and when necessary, the patients were referred to the physician.

The females and males were interviewed separately after embryo transfer and the second part of the couple was interviewed immediately after the first. The structured interview consisted of 68 items. Interviews were conducted personally by one of the authors (MB). There were 17 questions with five alternatives ranging from "of great importance" to "of no importance", and 51 questions with "yes" or "no" alternatives. The interviews lasted for approximately 20–30 min.

The semiquantitative questions allowed for a choice of five answers, where 1 was "of no importance" and 5 "of outmost importance". The answers were analyzed as nominal variables with 1–3, and 4–5 grouped.

Questions included demographic and reproductive characteristics. History of infertility, etiology, duration and previous treatments was sought for as well as a detailed number of questions concerning information. The patient where asked when they received information, from whom and at which stage in the IVF process. They were also asked what influence the information had caused.

The importance of information from the out-patient doctor, IVF doctor, midwife, media, patient organisations, partner and other sources were asked for.

Details about decision-making included when, why and how the decision was made. Influence by others than medical professionals was discussed. Open-ended questions specified knowledge about risks and benefits with one and two embryos transferred respectively and comments about

Table 1 Views about information and its influence in females and males in 54 couples undergoing in vitro fertilization

Views	Female <i>N</i> (%)	Male <i>N</i> (%)	Odds ratio ^a	95% CI ^a
I am completely satisfied with the information about the embryo transfer procedure before oocyte retrieval	42 (84.0)	30 (58.8)	3.30	1.29–9.12
I had no information	4 (9.5)	8 (20.0)	0.50	0.12–1.82
I believe it is a higher chance to become pregnant with two embryos at transfer	37 (77.1)	32 (66.7)	1.39	0.53–3.66
I was informed about the increased risk with twin pregnancies	46 (85.2)	34 (63.0)	3.12	1.22–8.59
I believe it was my decision to transfer one embryo	47 (88.7)	47 (88.7)	1.02	0.27–3.83
I had enough time for my decision	46 (86.8)	50 (92.6)	0.48	0.11–1.80

^aAll odds ratios and 95% confidence intervals adjusted for age

the information given. The possibility of getting pregnant and complications with duplex pregnancies and twins was in focus.

The outcome of previous treatments, controlled ovarian hyperstimulation, oocyte retrieval, fertilization rates and frozen embryos was considered. Finally, the availability the IVF doctor and the midwife during different stages of the IVF process was asked for.

The results were calculated on JMP 3.1 statistical programme (SAS Institute, Cary, USA). For crude comparisons, a χ^2 test (likelihood ratio) was used for nominal variables and *t*-test for continuous variables, which was reported as *p* value. Logistic regression (log likelihood test) were used when adjustment for age was made, and for estimation of odds ratios (OR) and 95% confidence intervals (95% CI).

The study was approved by the Research Ethical Committee, medical faculty, Uppsala University.

Results

The study includes 54 couples undergoing IVF. Mean age of the females was 32.5 years as compared to 35.3 years ($p=0.002$) in the males. The study population was in general employees or running their own enterprise, i.e.. 87.0% of the females and 96.3% of the males ($p=0.07$). Smoking was unusual, with 9.3% of the females and 11.1% of the males ($p=0.75$).

There were no significant differences in reproductive characteristics between the females and the males. Approximately 40% of both females and males had previous children but only 20% of the children were born in the present relation. Mean duration of infertility was 4.1 years and the couples had 1.7 previous IVF treatments. The understanding of the cause of infertility did not differ significantly between the sexes. Twenty-eight percent (28%) of the females and 22% of the males believed that the etiology was male infertility, while 50% of the females, as compared to 57% of the males said that the etiology was unknown.

Twenty-five (46.3%) of the women had a positive pregnancy test and 21 (38.9%) gave birth to a healthy baby. In 35 (64.8%) cases it was possible to cryopreserve good-quality embryos (103 embryos, on average 2.9). Twenty thawed-embryo cycles has been intended. In six of those, the embryos did not survive, and the remaining 14 cycles only resulted in two childbirths. These disappointing figures can partly be explained by problems with the freezer at that period.

Almost all women who underwent single embryo transfer were aware of the increased risks with twin pregnancies (Table 1) and the difference as compared to the men was significant. Significantly more women were completely satisfied with the information. A large majority of both females and males regarded the transfer of one embryo as their own choice, despite that they believed that double embryo transfer gave a higher pregnancy chance.

Both the midwife (100%) and the physician (87%) had been available for questions during the different stages of

Table 2 Factors that influenced the decision to transfer one embryo in females and males in 54 couples undergoing in vitro fertilization

Views	Female <i>N</i> (%)	Male <i>N</i> (%)	Odds ratio ^a	95% CI ^a
I believe that it is an increased risk for maternal complications with twin pregnancies	18 (33.3)	21 (38.9)	0.74	0.32–1.69
I believe that it is an increased fetal risk with twin pregnancies	39 (76.5)	23 (52.3)	2.93	1.18–7.59
The increased risks have influenced my decision	32 (65.3)	34 (73.9)	0.58	0.22–1.49
The doctor's advice made me change my decision	25 (50.0)	20 (40.0)	1.07	0.45–2.51
It was a difficult decision	19 (38.8)	8 (15.1)	3.14	1.21–8.71

^aAll odds ratios and 95% confidence intervals adjusted for age

Table 3 The importance of different factors for decision-making to transfer one embryo in females and males in 54 couples undergoing in vitro fertilization

Important or very important*	Female N (%)	Male N (%)	Odds ratio ^a	95% CI ^a
Previous children	13 (54.2)	10 (47.6)	1.96	0.52–8.33
Age, female	35 (66.0)	30 (55.6)	2.29	0.98–5.62
Ability to cryopreserve embryos	37 (68.5)	36 (66.7)	1.17	0.50–2.74
Increased risk with twin pregnancy	20 (37.0)	31 (57.4)	0.54	0.24–1.22
Pregnancy chance	46 (85.2)	45 (83.3)	1.35	0.46–4.12
Expenses (<i>n</i> =33)	18 (58.1)	13 (40.6)	1.62	0.56–4.72
Travel distance ≥ 200 km	9 (27.3)	6 (17.7)	1.55	0.46–5.45
Doctors' advice	47 (88.7)	47 (87.0)	0.88	0.25–3.09

*Four or five on a scale where five was very important and one was of no importance

^aAll Odds ratios and 95% Confidence intervals adjusted for age

the IVF treatment, equally distributed among sexes. The couples were questioned about who gave the information concerning embryo transfer. More than one alternative was possible to choose. Forty-two (38.9%) patients, when females and males were combined, answered “the midwife,” while 30 (27.8%) mentioned the “physician” (no significant difference). A substantial part of the patients, (28 patients; 25.9%) answered that they had found the main source of information “themselves”. There were no significant gender differences.

Both the females and the males felt strong confidence for the medical professionals (100%). The increased fetal risks with twin pregnancies were significantly more important for choosing single embryo transfer in women, as compared to men (Table 2). Maternal complications were, however, only considered in approximately one third of both the females and the males. The decision to have one embryo transferred was significantly more difficult for the women, as compared to the men.

Finally, the women and the men were told to rank the importance of 17 variables in five steps that could be important for the decision to transfer a single embryo. These variables were; previous children, previous twins, previous miscarriages, common children, duration of infertility, age of the female, age of the male, availability to freeze spare embryos, costs, travel distance from the IVF clinic, increased risks to have twins, physicians' recommendation, and influence of friends, relatives, media and the infertility patient organisation, respectively.

Some of these variables are presented in Table 3. There were no significant differences between females and males. Numerically, however, when the women were compared with the men, odds ratios were circa 2.0 for previous children, duration of infertility, and female age. On the other hand, odds ratio for increased *maternal* risk with twin pregnancy indicate that this was less important for the women than for the men. Costs for IVF were only evaluated among those who paid for IVF privately.

Obviously the chance of getting pregnant and the doctor's advice was very important for both females and males.

Discussion

Some of the important findings of this study were that the knowledge of the infertility cause was equal among females and males. There was a common belief that double embryo transfer gives a higher pregnancy chance, and that the patients experienced single embryo transfer as their own decision, although a large majority felt that the doctor's advice were very important. On the other hand, 50 and 60% of the females and males did not change their decision because of the doctor's advice, which means that they had made their decision to choose one embryo previously.

There were, however, differences between females and males, which must be considered when support to perform single embryo transfer is given by the medical profession. The females were more aware of the increased fetal risks with twin pregnancies, more satisfied with the information, and thought that single embryo transfer was a difficult decision, as compared to the males. This stresses the importance to consider the needs of both the female and the male when the couple receives information.

One strength of this study was that females and males were interviewed separately. Thus, we avoided communication that would allow for the female and male to give the same answers. This is not possible with a self-administered questionnaire. Other strengths were that the interview allowed for explanation of questions, minimizing the responder's interpretation of a question. A personal interview may, however, also induce weaknesses in the study. The respondent might perceive the opinion of the interviewer and could be eager to provide the “right” answers.

The size of the study only allowed for detection of the most important differences, which was reflected by the occasional wide confidence intervals. In Table 3, however,

the women seemed to be more influenced by personal factors, such as age, duration of infertility and previous children. For both the females and the males the pregnancy chance was, naturally, very important. There was a tendency that the males were more concerned with pregnancy risks, while the females were more aware of the fetal risks with twin pregnancies. We believed that the couple consider themselves of having a high pregnancy chance, even when only one embryo was transferred. The majority of the couples, however, still thought that there was a higher pregnancy chance when two embryos are transferred.

Participation of the patient in decision-making in medical care is regarded desirable for many reasons. Some of the most important reasons are patient satisfaction and outcome of medical interventions. From areas other than IVF it has been shown that patient involvement in decision-making gives better compliance [15] and outcome of treatment [16]. We are pleased that a large majority of the patients, especially among those who received one embryo, apprehend that it was their decision and at the same time consider the physician's advice very important. Patients with a smaller pregnancy chance might, however, disregard the information about risks with multiple pregnancies and focus on the possible increased pregnancy chance with two embryos transferred. A large majority of the patients wish to make a shared decision with the doctor [17]. Young, female and well-educated patients are more prone to be involved in medical decision [18]. These characteristics are true for couples undergoing IVF treatment.

A patient's competence in decision-making declines in stressful situations [19]. Infertility gives often rise to a life crisis. According to some investigators [20] the anxiety is greatest at the first and the last IVF cycle, at embryo transfer, and when the pregnancy test should be made. Many patients feel that the IVF treatment could be their "once in their life chance".

Some previous studies have addressed gender differences in general about infertility and IVF treatment Wirtberg [21] found that women reacted earlier than men on the couple's infertility and that the women took the initiative to contact medical authorities. Frank [14] reported that among infertile couples males were more concerned about potential side effects of treatment, while women placed more emphasis on treatment outcome. Hjelmstedt et al. [22] found that the women had a more intense desire to have a child, whereas for the where men the obligation of fulfilling the male role and the social pressure of becoming a parent were the most central themes. The present study partly confirms these results, where the decision to have one embryo transferred, with an assumed lower pregnancy chance, was more difficult for the women than for the men. There was also a tendency that women who chose single embryo transfer considered factors that were positively associated with outcome, such as young female age, short duration of infertility and previous children.

There seem to be gender differences also in psychological aspects of IVF treatment. Laffont and Edelmann [23] found that women had a higher degree of emotional distress than men. Women were more affected by most of the variables that were evaluated, such as sadness, anxiety, sleeping problems, lack of confidence and isolation, as compared to males. On the other hand male infertility has been related to a higher level of male stress, as compared to the stress level in males where female infertility is the course [24, 25]. Other studies showed that women were more concerned of being infertile, of experience parenthood, and of the desire to have a child, than men. The women thought about infertility more frequently, had more difficulties to separate the infertility from other aspects of life, and had a lower self-esteem, as compared to the men [22, 26, 27]. Boivin et al. [28] compared "distress-, intimacy-, optimism- and fatigue levels" in couples at different *stages* of the IVF treatment and found similar responses in females and males. Distress increased equally among females and males at oocyte retrieval and embryo transfer, but mostly in connection with the pregnancy test. It seems as if the women suffers more from infertility as such, while men feel equally distressed about the treatment procedure.

Two dissertations [29, 30] addressing "empowerment" aimed to authorize the patients to take responsibility for certain elements of the treatment, and to participate in its design. In the IVF context this could imply that the couple would have the opportunity to learn and discuss about the importance of the embryo quality, number of embryos transferred, pregnancy outcome, and possible medical risks. Glover et al. [31] found that between 75–88% of men attending a male sub fertility clinic expected information about their specific problem, discussion about possible treatment alternatives, having their question answered and help with decision-making. Fewer males (52%) in the study found it important to discuss their feelings about infertility.

Another study [32] showed the importance of medical information and patient-centered care. Almost all of the participants in the study found information about test results important, and potential treatment options would be explained by the medical staff, while fewer men than women were interested in receiving written information.

During 2003 The National Board of Health and Welfare in Sweden issued recommendations which stated that, "in general", one embryo should be transferred. The choice to transfer one embryo only is difficult. The medical information, the "empowerment" of the patients in decision-making and a supportive attitude are important aspects in providing quality care. The midwife has a natural position in the IVF-patient care when optimal medical information and support should be given. Our study has shown similarities and differences among the women and the men. The results

indicate that the men should be more involved in the decision to transfer one embryo only, while the women need more support in the decision, as compared to the men. The couple must be considered as a unit, but gender differences must be emphasized when information is given. This could be implemented by awareness and sensitivity of possible different needs for the male and female, in particular on the matters that were shown in this study.

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