



Short Communication

Deciding how many embryos to transfer after in vitro fertilisation: Development and pilot test of a decision aid

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ABSTRACT

Objective: When deciding how many embryos to transfer during in vitro fertilisation (IVF), clinicians and patients have to balance optimizing the chance of pregnancy against preventing multiple pregnancies and the associated complications. This paper describes the development and pilot test of a patient decision aid (DA) for this purpose.

Methods: The development of the DA consisted of a literature search, establishment of the format, and a pilot test among IVF patients. The DA development was supervised by a panel of experts in the fields of subfertility, obstetrics and DA-research and it was based on the criteria of the International Patient Decision Aid Standards.

Results: One Cochrane review and 34 articles were selected for the DA content. The DA presents information in text, summaries, tables, figures and through an interactive worksheet. The DA was reviewed positively and as acceptable for use in clinical practice by patients and professionals.

Conclusion: The DA was thoroughly developed and is likely to be helpful for the decision-making process for the number of embryos transferred after IVF.

Practice implications: Physicians and researchers can use the DA without restriction in clinical practice or research related to decision-making.

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1. Introduction

Subfertility is a significant health problem and affects approximately 80 million couples globally [1]. In vitro fertilisation (IVF) is an important treatment option for subfertile couples: more than 365,000 IVF cycles take place in Europe annually. Multiple pregnancies represent roughly a quarter of all pregnancies after IVF [2,3]. There is extensive evidence of higher mortality and morbidity rates for both the mothers and neonates with multiple pregnancies than with singleton pregnancies [4–12]. Long-term consequences of these complications vary, but may result in life-long handicaps [13,14]. Moreover, these complica-

tions of multiple pregnancies cause substantial use of medical budgets [15,16].

Prevention of multiple pregnancies after IVF is fairly easy to accomplish. If only one embryo is transferred instead of two or more, the incidence of multiple pregnancies will diminish to 0–1% [17–19]. However, the use of elective single embryo transfer (eSET) could also reduce the pregnancy rate per IVF cycle [20–22]. The difficult balance between an acceptable pregnancy rate and prevention of multiple pregnancies is probably why implementation of eSET in clinical practice has not been very successful. In Europe, single embryo transfer was used in only 19% of all IVF cycles in 2004 [2].

How many embryos to transfer should ideally be decided in a shared decision-making process by an educated and empowered couple. We have previously explored this issue with IVF professionals and patients, who both agree that these requirements were not present in IVF care [23]. Moreover, those requirements have been identified as important barriers to eSET

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use [20,24–27]. Therefore, we have developed a decision aid (DA) to promote shared decision-making for the number of embryos transferred. DAs increase knowledge and support the decision-making process [28–32]. They contain descriptions of treatment options and clarify risks and consequences of all options in text and visual form. Many DAs assist patients to determine and integrate their own preferences. This paper describes the development of a patient DA for the number of embryos transferred after IVF.

2. Methods

2.1. Systematic approach

The DA development consisted of three steps: a literature search, selection of framework and format, and a pilot evaluation. An expert panel including subfertility specialists, epidemiologists, an obstetrician, an embryologist, an economist, and a DA researcher supervised the DA development.

2.1.1. Literature search

On the basis of our expert panel's opinion and experiences of patients, we identified four domains that are important for a thorough decision for the number of embryos transferred: (1) optimizing the chances of pregnancy after eSET or double embryo transfer (DET), (2) factors predicting the chance of pregnancy, (3) the differences in complication rates for singleton and twin pregnancies and (4) the couples' preferences in this decision. For the first three domains a literature search was performed to collect data for the content of the DA. At least two individuals independently evaluated the papers identified. The inclusion of papers was based on methodological quality and, if applicable, incidence and severity of the potential complications. We also included a randomized controlled trial (RCT) from our own centre, relevant to the first domain [20]. Thus, data regarding the chances of pregnancy mentioned in the DA were based on both local and international results. The format chosen for the fourth domain of personal preferences was determined on the basis of other DAs described in the literature [33].

2.1.2. Selection of framework and format

The DA was modelled on the Ottawa Decision Support Framework [34]. The objective of the DA was to prepare couples for their upcoming decision-making process with their IVF professional. The DA explained the difficult balance between chance of pregnancy and complications associated with twin pregnancies in the course of a variable number of IVF cycles and it presented the information in a patient friendly format. The DA format was designed in concurrence with the checklist of the International Patients Decision Aid Standards, and consisted of 50 items divided over three domains [35].

2.1.3. Pilot evaluation

After our expert group, and employees of the patient association for subfertility in the Netherlands 'Freya', evaluated the DA, we pilot-tested it among seven couples with previous IVF experiences and three couples who were facing the decision for eSET or DET at that time. The seven experienced couples were recruited via the Freya website and the three inexperienced couples were included from the IVF waiting list of our own centre. We evaluated the clearness, structure and relevance of the content, tables and figures of our DA with a questionnaire containing 23 items (20 Likert scale questions and three opportunities for improvement suggestions).

Table 1

Literature used for decision aid content.

eSET versus DET pregnancy rate	Complication occurrence of twin and singleton pregnancies after IVF
Pandian et al. [19] (Cochrane review)	ESHRE Campus course 2001 [36]
Lukassen et al. [20] (local trial)	Bryan et al. [37]
Gerris et al. [22]	Coonrod et al. [38]
Martikainen et al. [18]	Dhont et al. [8]
Thurin et al. [21]	Ericson et al. [39]
Van Montfoort et al. [22]	Helmerhorst et al. [4]
	Klemetti et al. [40]
	Koivurova et al. [41]
	Leslie et al. [42]
Predictors of pregnancy with IVF	Lieberman et al. [43]
Templeton et al. [45]	Mahskeed et al. [44]
Smeenk et al. [47]	Murdoch et al. [46]
Strandell et al. [49]	Ochsenkuhn et al. [48]
Hunault et al. [51]	Pinborg et al. [50]
Hunault et al. [53]	Pinborg et al. [52]
	Pinborg et al. [10]
	Pinborg et al. [54]
	Pinborg et al. [5]
	Rao et al. [11]
	Rutter et al. [55]
	Scher et al. [13]
	Schieve et al. [12]
	Stromberg et al. [14]
	Westergaard et al. [56]

3. Results

3.1. Findings systematic approach

3.1.1. Literature search

Of the 69 papers identified in our literature search, 35 informed the DA content (Table 1). With respect to optimizing the chance of pregnancy after eSET or DET, we included one Cochrane review and five RCTs. We used five papers for the factors predicting chance of pregnancy and 24 papers reporting the differences in complication rates for IVF singletons and IVF twins.

3.1.2. Framework and format

The DA contains three chapters. Chapter one describes optimizing the chances of pregnancy with eSET and DET and names the factors that predict chance of pregnancy. It shows that two IVF cycles with eSET have a chance of pregnancy similar to the chance with one DET cycle. Chapter two reports on the differences in complication rates of IVF singletons and IVF twins. Fig. 1 integrates the information of both chapters. Chapter three provides an 'action plan', assisting couples with their decision for eSET or DET. This plan is supported with a worksheet (Table 2) to help couples explore their preferences in balancing the chance of pregnancy and risks of complications.

We structured the DA with short paragraphs containing a one or two sentence summary. Tables and figures present essential aspects.

3.1.3. Findings pilot test

All patients approved the DA and most found it clear and well structured. After reading the DA, patients reported that they fully understood the pros and cons of eSET and DET. They also valued the DA as a good tool for improving the quality of IVF care. We observed no differences in opinion about the DA between the couples with IVF experience and the couples facing the decision for the number of embryos transferred at the time of evaluation.

The pilot test resulted in some improvements for the DA. For instance, we changed the order of chapters, used different terminology in tables, and chose to describe complications assuming that a viable pregnancy resulted from a transfer, rather

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