

The Comparison Between the Pregnancy Outcome after Easy Embryo Transfer and Difficult Embryo Transfer

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Abstract

Background: The role of embryo transfer (ET) in the success of in vitro fertilization/intra cytoplasmic sperm injection treatment is not well understood. In the present study we classified ET technique as difficult and easy types according to certain strict criteria, and compared the pregnancy outcome of the two ET types.

Methods: This study was performed retrospectively on 295 infertile patients undergoing 308 embryo transfer cycles during May 2006-March 2007 in Mashhad IVF center.

These cycles were divided into two groups. Group I had an easy embryo transfer (n=248) and group II had a difficult embryo transfer (n=60). The ET was considered as easy if the catheter insertion was successfully achieved without difficulty or needed slight manipulations of speculum or outer sheath of the catheter. ET was considered as difficult if slight maneuvers did not result in successful catheter insertion, tenaculum was used, or there was a need to use rigid catheters. Observation of beating fetal heart in a gestational sac of 6-7 weeks considered as positive pregnancy. Comparison of the pregnancy outcome between both groups was performed by using Student *t* test and Chi-square test. The results were shown as $X^2 \pm SD$. P value < 0.05 was considered statistically significant.

Results: The differences between two groups regarding age, number of follicles ≥ 14 mm, number of retrieved oocytes, and number of transferred embryos were not significant ($P > 0.1$). The total number of pregnancies was 55 (17.9%): 48 (19.4%) in group I and 7 (11.7%) in group II. The difference was not significant ($P = 0.163$).

Conclusion: Although the rate of positive pregnancy with easy ET was higher than difficult ET, there was no significant difference between the two groups ($P = 0.163$). This may be due to the type of classification of easy and difficult, or fewer patients.

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Keywords • IVF • embryo transfer • pregnancy

Introduction

Emryo transfer (ET) is a crucial step in the success of in vitro fertilization (IVF) treatment. The technique of ET is a very valuable and important factor and may

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affect the success of IVF.^{1,2} During ET, the aim is to pass the catheter through the cervix to the uterine cavity without touching the fundus and with the least possible trauma to the endometrium. Therefore using ultrasound as a guide of transfer has been reported to affect the success rate in some centers.^{3,4}

Presence of blood or mucus on the cervical canal can decrease the chance of implantation and pregnancy. The type of the catheter (soft versus firm) used for ET may also affect the pregnancy rate.^{5,6}

The degree of difficulty of ET is independent of achieving pregnancy after in vitro fertilization/intra cytoplasmic sperm injection (IVF/ICSI). In the present study, we categorized ET to difficult and easy according to strict criteria that will be presented in patients and methods section and compared the pregnancy rates between these two groups. The results are used to realize which factors may be important to be considered in ET technique.

Patients and Methods

The present study was performed retrospectively on 295 infertile patients undergoing 308 ET cycles during May 2006-March 2007. The study was conducted in Montaserieh IVF clinic, a university-based center affiliated to Women Health Research Center in Mashhad (north-east Iran). All patients had a previous thorough evaluation for infertility.

Different causes of infertility such as those pertain to males or females, and unexplained infertility were included. In the present study, down regulation were done with mid luteal gonadotropin releasing hormone agonist administration (Superfact Adventism Pharma, Frankfurt, Germany). Pituitary down regulation was confirmed by using sonography of pelvis in the 2nd day of the cycle that showed thin endometrium (<4 mm) and follicles <10 mm in diameter, as well as by measuring serum estradiol (<50 pg/ml) and LH (<5 IU). Ovarian stimulation was achieved by using variable daily doses of recombinant FSH (Gonal F, Serono, Switzerland).

The dose was increased according to the follicular size that was followed by serial transvaginal ultrasonography. An intramuscular injection of 10000 IU HCG (Pregnyl, Organon, Netherlands) was administered when at least three follicles were >18 mm in diameter. Oocyte retrieval was performed 36 hours after the HCG injection. Embryo transfer was carried out 2-3 days after the ovum pickup with maximum five embryos.

During embryo transfer the patients were in the lithotomy position with mild sedation. This

procedure was controlled by speculum placed in the vagina to expose the cervix. The cervix was cleaned with sterile saline solution and culture medium followed by aspiration of the cervical mucus. The catheter (Wallace, England) was loaded with the embryos and smoothly introduced through the cervical canal up to 1–2 cm from the uterine fundus, while care was taken to avoid touching the fundus. This procedure was controlled under transabdominal ultrasound guidance (Hitachi 405, Japan).

If the insertion of the catheter was achieved without difficulty or only slight manipulations of speculum or outer sheath of the catheter was needed, the ET was considered to be an easy transfer (Group I). If such maneuvers were not sufficient and a tenaculum was used or rigid catheters were used, the ET was considered to be a difficult transfer (Group II).

The catheters were checked for the presence of retained embryos immediately upon withdrawal. Pregnancy was considered positive when beating fetal heart was detected in gestational sac of 6-7 weeks.

Age, number of follicles \geq 14 mm, number of retrieved oocytes, number of transferred embryos and clinical pregnancy were recorded and compared between the two ET groups.

The data were obtained and statistical analyses were performed by using SPSS software (version 11.5). The comparison between the two groups was performed by using Student *t* test and Chi-square test. The results were shown as $X^2 \pm SD$. P value <0.05 was considered as statistically significant.

Results

There were 248 (80.5%) easy (Group I) and 60 (19.5%) difficult (Group II) embryo transfers.

The following results were found in Group I: The mean age of the patients was 30.8 ± 5 years, total number of follicles \geq 14 mm was 10.5 ± 5.2 , and mean number of retrieved oocytes was 7.5 ± 4.6 . The mean number of transferred embryos was 3.07 ± 1.14 .

The following results were found in Group II: The mean age of the patients was 30.2 ± 4.8 years, the number of follicles \geq 14 mm was 11.5 ± 5 . The number of retrieved oocytes was 8.6 ± 5.2 , and the number of embryos replaced were 3.15 ± 1.13 (table 1).

There was no significant difference between the two groups for the above mentioned variables ($p > 0.05$).

The clinical pregnancy rate after easy embryo transfers was 48 (19.4 %) and after difficult transfers was 7 (11.7 %) ($P = 0.163$, table 1).

Table 1: Comparison of the patients and pregnancy rates according to the degree of difficulty of ET after IVF/ICSI.

	Easy embryo transfer (n= 248)	Difficult embryo transfer (n=60)	P value
Mean age in years	*30.8±5	30.2±4.8	0.377
No. of follicles≥ 14 mm	10.5±5.2	11.5±5	0.192
No. of oocytes retrieved	7.5±4.6	8.6±5.2	0.117
No. of embryos transferred	3.07±1.14	3.15±1.13	0.638
Pregnancy rate (%)	19.4%	11.7%	0.163

* mean ± SD

Discussion

The present study demonstrates that the difficulty of embryo transfer is not correlated with the success of IVF/ICSI. The patients with easy embryo transfer became pregnant slightly more than those with difficult transfer. However, the difference was not significant. (19/4% versus 11/7%).

These finding support the results of previous studies.^{7,8} Although some studies have reported results that are different from those of the present study,^{9,10} such discrepancy may be due to different criteria used to categorize difficulty of embryo transfer. Turkaps, et al. graded cases with mild uterine manipulation as difficult ET,⁷ whereas Candida, et al. considered use of forceps for pulling the cervix and a harder catheter (TDT) instead of initial soft catheter, uterine sounding or dilatation of cervix as difficult ET.¹¹

In this study if a tenaculum was used or if there was a need to change to rigid catheters, the ET was considered to be a difficult transfer.

In difficult transfer, the lower pregnancy rate may be related to several factors. Laceration of the cervix or touching the endometrium in the uterine fundus may diminish the implantation rate.¹²⁻¹⁴ The presence of mucus in the catheter may retain the embryos,¹⁵ and uterine contractions may interfere with implantation,¹²⁻¹⁶ as well as infection on the tip of the catheter may increase unsuccessful cycles.¹⁷ In the present study 19.5% of transfers were difficult. Use of abdominal sonography may reduce the number of difficult transfer.^{18,19} Also, some authors recommended the use of a mock transfer prior to embryo transfer,^{1,20} although the predictive value of such intervention is undefined.²¹ In the present study we performed mock transfer. Distention of bladder, use of antibiotics, speed of injection, and type of catheter may also influence the outcome.^{20,22,23} In our study, we were not able to compare the different types of catheters, because a Wallace soft catheter was used in most of embryo transfers.

The use of cervical dilatation at the time of oocyte retrieval may be justified in success of transfer.²¹

In brief, this study demonstrates that the degree of difficulty in embryo transfer after

IVF/ICSI is not a significant factor to determine the success of the treatment. This may be due to the type of classification of easy and difficult, or our fewer patients.

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