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The correlation between mock embryo transfers prior to the start of IVF cycle with real embryo transfer

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Abstract

Background: It has been demonstrated that performing a mock embryo transfer (ET) significantly improves the pregnancy rate in IVF cycles. The mock ET could be performed prior to the stimulation cycle or immediately before real ET. The problem of the first procedure is the possibility of variation in the uterine position and or cervico–uterine angle.

Objective: The purpose of this study was to determine the consistency of the type of ET in mock ET prior to the treatment cycle with real ET.

Materials and Methods: A prospective comparison between the technique of mock embryo transfer and real embryo transfer. One hundred and sixty treatment cycles on 141 patients between January 2003 and September 2004 ended to ET and they were analyzed prospectively. In each cycle, patients underwent a mock ET in mid luteal phase prior to treatment cycle (the date when patients referred to have consultation about down regulation regimen).

Results: Of 160 mock ET the Wallace catheter passed easily in 144 (90%) of them. In the remaining 16 cycles (10%) a tenaculum and or a rigid cannula had to be used. From 144 cases of easy mock ET, real ET was easy in 121 (84%) cases while 23 (16%) cases had difficultly during real ET. In the 16 cases of difficult mock ET, there was 8 cases (50%) of difficult real ET and 8 cases (50%) of easy real ET ($p=0.001$, $\chi^2=10.67$). The overall clinical pregnancy rate for both difficult and easy transfer was 35%. The pregnancy rate for easy real ET was 37.2% and for difficult real ET was 25.87%. Despite of the difference, the statistical analysis shows no significance difference ($\chi^2=1.21$). The difference between mean age for both difficult and easy real transfer was not significant.

Conclusion: Mock ET before beginning of the treatment cycle is highly consistent with real ET.

Keywords*: Real embryo transfer, Implantation, Mock embryo transfer*

Introduction

Embryo transfer (ET) is the last step in the In Vitro Fertilization cycle (IVF). At this step the most important product of IVF, the embryo, is blindly and occasionally with difficulty transferred to the uterus. It is estimated that poor embryo transfer technique may account for as much as 30% of failures in assisted reproductive techniques (1). There are several suggestions for overcoming the mechanical problem of embryo transfer technique. Some of them are proper evaluation of the length and, the direction of the uterine cavity to discover any unanticipated difficulty in entering the uterine cavity and also to choose the most suitable catheter for ET (1). Mock ET was introduced to minimize the problem of ET and to improve the pregnancy rate (2). Mock ET has been performed either prior to initiation of IVF treatment cycle or immediately before the real ET (3). The problem with the former is that the mobility of the uterus and enlarged ovaries direction in patient may vary on the day of the embryo transfer from what it was during the mock ET (3,4). Considering the unanticipated difficulty in entering the uterine cavity (that most gynecologist involved in IVF program, have certainly confronted with several cases), the suitable equipment would have been prepared to solve the problem. In review of literature, there was only one study comparing the actual incidence of the change in uterine position between mock and real ET (5). In our study from January 2003 to September 2004, mock ET was done before starting the IVF cycle and the technique of mock ET was compared with real ET according to a specific criterion. The

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purpose of this study was to determine the consistency of the type of ET at mock ET prior to the treatment cycle with real ET.

Materials and Methods

One hundred and sixty treatment cycles on 141 patients between January 2003 and September 2004 which ended to ET, were analyzed prospectively. In each cycle patients underwent a mock ET in mid luteal phase prior to treatment cycle, (the date when patients referred to have consultation about down regulation regimen).The mock ET was done under 3.5 MHz trans-abdominal ultrasound probe (Hitachi, EUB-405, Tokyo, Japan) guidance with full bladder in the dorsal lithotomy position. During mock ET the cervix was first inspected for unusual findings like polyp, fibroid and erosions. After cleaning the cervix, a reesterilized ET Edwards-Wallace catheter (SIMS Portex Ltd, Kent, UK) was gently inserted into the internal os, while observing the catheter passage by ultrasonography. If the insertion of the catheter was done without difficulty or if slight manipulations of speculum or outer sheath of the catheter overcame the obstacle, the mock ET was graded as easy transfer. But if such maneuvers didn't work and a tenaculum was used or if there was a need to change to rigid catheters, the mock ET was graded as difficult transfer. In addition to grading of the transfer, the length and position of uterine cavity were recorded. The patients began their IVF treatment cycles and after ovum pick up, the ones that had embryo were scheduled for ET. In real ET patients without getting any premedication, were put on to dorsal lithotomy position with full bladder. The transfer was done with ET Edwards-Wallace catheter under ultrasound guidance. The other procedures were similar to mock ET. Embryos were replaced about 1.5cm below the uterine fundus. The same scoring was used for real ET. The age of the patients and outcome of each cycle (observation of beating fetal heart in a gestational sac of 6-7 weeks considered as positive) were recorded. The statistical analysis was performed using Chi-Square test.

Results

The mean age of infertile women was 27.59 years old. The difference between mean age for both difficult and easy real transfer was not significant (p=0.067). From the total of 160 mock ET, the Wallace catheter passed easily in 144 (90%) of them. In the remaining 16 cycles (10%), a tenaculum and or a rigid cannula had to be used. From 144 cases of easy mock ET, real ET was easy in 121 (84%) cases and in 23 (16%) cases difficulty was met in real ET. From 16 cases of difficult mock ET, there were 8 cases (50%) of difficult real ET and 8 cases (50%) of easy real ET (table I). The Chi square test shows that there is a significant relation between easy mock and easy ET (p=0.001, χ^2=10.67).The overall clinical pregnancy rate in both difficult and easy transfer was 35%. The pregnancy rate for easy real ET was 37.2% and for difficult real ET was 25.87%. However, the difference was not statistically significant (χ^2=1.21) (table II).

Table I. The correlation between mock and real embryo transfer

Real transfer / Mock transfer	Easy	Difficult	Total
Easy	121 (84%)	23 (16%)	144 (90%)
Difficult	8 (50%)	8 (50%)	16 (10%)
Total	129 (80.6%)	31 (19.4%)	160 (100%)

p=0.001 *χ^2= 10.6*

Table II. The correlation between the technique of real ET and pregnancy rate

Pregnancy / Real transfer	Negative	Positive	Total
Easy	81 (62.8%)	48 (37.2%)	129 (100%)
Difficult	23 (74.2%)	8 (25.8%)	31 (100%)
Total	104 (65%)	56 (35%)	160 (100%)

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Discussion

Embryo transfer is the final and most critical step in IVF cycles. About 80% of patients undergoing IVF reach the embryo transfer stage (1), but only minority of them achieves pregnancy. Some mechanical factors might account for lack of implantation (2). Initiation of uterine contractility is one important factor that may lead to an immediate or delayed expulsion of embryo (6-8). Stimulation and traction of cervix by tenaculum causes the release of oxytocin (8,9) and touching the uterine fundus is another cause of uterine contraction (10). Improper placement of the embryo into the uterine cavity is another important factor that may lead to a desperate end to an elaborated process. Therefore, it is important to evaluate the uterine cavity before the IVF cycle in order to ensure the proper placement of the embryo. It has been demonstrated that performing a mock ET significantly improves the pregnancy rate (2). This procedure is important to evaluate the length and direction of the uterine cavity and cervical canal and to choose the most suitable catheter for the embryo transfer. It also helps to discover any unanticipated difficulty in passing the catheter through cervical canal, such as pinpoint external os, cervical polyp or anatomical distortion of cervix from previous surgery or due to congenital anomalies. The mock ET can be done before the stimulation cycle or even right before the actual embryo transfer (3). It seems that mock ET before the stimulation cycle enable us to determine the most suitable catheter and technique for transfer before beginning the cycle, so we will not confront a difficult or even impossible ET without having the required equipment and facilities. According to Sharif *et al* (3) there is a possibility that the direction of the uterus would change, so the real transfer won't be the same as mock ET. The consistency in the uterine position between mock and real ET has been studied by Henne and Milki (5). They find out that retroverted uterus at mock ET will often change position and become anteverted at real ET (55%), but only 2% of anteverted uterus converted to retroverted at real ET. They suggest that the enlarged ovaries resulting from controlled ovarian hyperstimulation has some role in the conversion of uterine position (5). Their study can explain our finding, which 16% of easy mock ET were converted to difficult real ET. The correlation was highly significant (χ^2=10.676, p=0.001). The impact of difficult ET in clinical pregnancy rate is a subject of debate. In the literature, some studies have shown that there is a correlation between difficult ET and reduced pregnancy rate (11,12), whereas some studies have suggested that difficult or repeated ET does not adversely affect the outcome of IVF (13). These contradictory findings may be explained by different definition of difficult ET and or patient selection. In our study pregnancy rate of easy and difficult transfer were 37.2% and 25.8% respectively. The difference was seen but it was not statistically significant that may be explained by the small sample size.

Conclusion

Mock ET before beginning of the treatment cycle is highly consistent with real ET. Therefore, we can suggest it a reliable method for prediction of the technique of real ET. Difference between pregnancy rate in easy and difficult real transfer was not statistically significant (37.2% versus 25.8%), but it was clinically important.

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