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Multiple Attempts at Embryo Transfer do not Adversely Affect In-vitro Fertilization Pregnancy Rates: Related Mucus Contamination

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Objective: We investigate the effects of multiple attempts of embryo transfer because of retained embryos in the catheter and of contaminated mucus on the transferred catheter.

Materials and Methods: We respectively analysed data between November 1998 and August 2002 from 305 patients of 369 cycles who underwent IVF-ET. Of these patients, 47 patients of 50 cycles (Group 2) were required multiple trial of embryo transfer. They were compared with an age-matched control groups (Group 1) with female factor infertility.

Pearson's χ^2 and Fisher's tests were used to compare proportions between discrete variables. Non-categorical data were compared using t-test. Statistical significance was set at $p < 0.05$.

Results: Embryos were significantly more likely to be retained when catheter was contaminated with mucus (Group 1: 22.4%; Group 2: 44.0%). The clinical pregnancy rates, however, for the contaminated mucus or not, were 46.8%, 43.5% respectively. There was no significant difference clinical pregnancy rate between those who had all their embryos transferred at the first attempt (45.4%) and those who required more than one attempt (48.0%).

Conclusions: Contaminated mucus in the catheter is associated with failed embryo transferred at the first attempt. Embryo transfers, however, that are repeated attempts do not adversely affect pregnancy rates following IVF-ET.

Key Words: Retained embryos, Mucus contamination, IVF-ET

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1)

gonadotropin releasing hormone agonist (GnRHa, Lucreline subQ, AB-BOT) follicle stimulating hormone (FSH, Metrodin, Serono) human menopausal gonadotropin (hMG, Pergonal, Serono) GnRHa (GnRHa long protocol)

21 GnRHa

3

FSH

FSH

hMG

estradiol(E₂)

18 mm

가 3

10,000 IU

human

chorionic gonadotropin (hCG, Profasi, Serono)

hCG

36

Tur-Kaspa

(Single Lumen Ovum Pick-Up Needle Set, COOK)

37 5% CO₂

(SZH10, Olympus)

(oocytes cumulus complex,

OCC)

OCC가

(germinal vesicle,

GV)

10% synthetic serum substrate (SSS

Irvine)

가 P 1 (Preimplantation 1)

(metaphase II, MII)

(metaphase I, MI)

(immature, GV) 20

3-4 , 8-10 ,

~48

CO₂

3~5

가

2)

F-10 Nutrient Mixture Medium

가
가
Nabi (1997)⁵
가
(1998)⁶
가
가
가
1.
1998 11 2002 6
258 319
(Group 1)
가
47 50 (Group 2)

(Ham's F-10, Gibco) 0.5% antibiotics (Penicillin-G, Streptomycin sulfate) 가 . 5)

P 1 37

(2.04 mM CaCl₂ · 2H₂O, 101.6 mM NaCl, 4.69 mM KCl, 0.2 mM MgSO₄, 25 mM NaHCO₃, 0.33 mM Na-pyruvate, 21.4 mM Na-lactate, 0.05 mM Taurine, 0.15 mg/l Na-citrate, 10 ? g/l Gentamicin, 0.005 g/l Phenol red) 5% CO₂ 10% SSS가

가 P 1 72

가 가

Sigma (G1), 가

95% 가 G2, 가

, 37 5% CO₂ (CO₂ incubator, Heraeus) 10 20% G3, 50%

G4, 가

3) (human follicular fluid, hFF) 가 가

G5 . 8

G1, G2 GQER

(good quality embryo rates)

30

56 35 (heat inactivation) 0.22? m (Sterivex GV, Millipore) -20 . bivalve speculum

4) (masturbation) G1~G3 4~5

37 20~30 (WHO)⁸ Tomcat

10% (Tomcat Catheter, 8890-793021, Sherwood medical, USA) . Tomcat

가 Ham's F-10 2 1 ml TDT

pellet Ham's F-10 5% CO₂ (T. D. T Catheter set, 2583-R106, Laboratoire CCD, France) 3

30 (swim up) (insemination) 5 ?1 , 10~20 ?1

18~22 (fertilization) , 5 ?1

(male pronuclear) (female pronuclear) 0.5~1 cm

(polar body)가

2

1 가 4~5 가

Table 1. Comparison of clinical characteristics and outcomes in patients without (Group 1) and with (Group 2) retained embryos at transfer

| | Group 1 (n=319) | Group 2 (n=50) |
|-------------------------------|-----------------|----------------|
| Age | 31.7 ±3.1 | 31.3 ±2.9 |
| Duration of Infertility (yrs) | 4.8 ±2.9 | 5.2 ±2.9 |
| IVF indication | | |
| Uterine factors | 8 | 1 |
| Tubal factors | 148 | 22 |
| Endometriosis | 47 | 12 |
| Ovulatory factors | 22 | 0 |
| Peritoneal factors | 2 | 0 |
| Unexplained | 91 | 15 |
| No. of oocyte retrieval | 11.0 ±6.3 | 13.9 ±7.2* |
| Fertilization rate (%) | 80.9 ±16.4 | 77.6 ±13.4 |
| GQER (%) | 39.4 ±26.0 | 37.7 ±21.3 |
| No. of embryo transfer | 4.8 ±1.1 | 5.0 ±0.8 |
| Mucus/cycles | 24.4 (78/319) | 44.0 (22/50)† |
| Pregnancy rate (%) | 45.5 (145/319) | 48.0 (24/50) |
| Implantation rate (%) | 34.5 (248/718) | 35.3 (42/119) |

*† p<0.05

6) 가 Table 1
 (Progesterone in oil, Progest, Samil Pharma, Korea) 50 mg, GQER 가
 13 ?-hCG 1 24.4%
 , ?-hCG 가 (78/319), Group 2 44.0% (22/50) Group 2
 3. (p=0.0038, χ^2 -test). 45.4%, 48.0%
 SAS Pearson's
 χ^2 test Fisher's test (Table 1).
 ,p 0.05 2.

Table 2. Comparison of pregnancy outcome with and without mucus

| | Mucus (+) (n=100) | Mucus (-) (n=269) |
|-----------------------------------|-------------------|-------------------|
| Age | 31.4 ±2.7 | 31.8 ±3.2 |
| Duration of infertility (yrs) | 4.8 ±2.7 | 4.9 ±2.9 |
| No. of oocytes retrieval | 10.9 ±5.4 | 11.6 ±6.8 |
| Fertilization rates (%) | 79.7 ±15.2 | 80.8 ±16.4 |
| GQER (%) | 43.1 ±25.3 | 37.7 ±25.4 |
| No. of embryo transfer | 4.9 ±1.0 | 4.8 ±1.1 |
| Multiple attempts rates at ET (%) | 22.0 (22/100) | 8.2 (22/269)* |
| Pregnancy rates (%) | 43.0 (43/100) | 46.8 (126/269) |
| Implantation rates (%) | 35.6 (73/205) | 34.3 (217/632) |

*p<0.05

가 , , GQ- ER, Tomas (2002)¹⁰ multiple logistic regression 가 43.0%, 46.8% 가 (p=0.5, Table 2). 가 100 22 가 가 16 2 11,12 6,13 8 ,6 3 3 269 28 가 , 가 22 2 10 ,6 가 , 가 . Kovacs (1999)¹⁶ , , , 가 . Goudas (1998)¹⁷

가

Visser (1993)¹ Nabi (1997)⁵
가
, Mansour (1994)²
가 가

(1993)¹ 가 Visser 가
, Nabi (1997)⁵ 가

가 가

44.0% 24.4%

(1997)⁵ Nabi
18 71% 0.5~1 cm
Waterstone (1991)²²
5 cm

가 49% (1985)²³ Nazari (1993)²⁴ 가 Yovich
, 0.5 cm

29.6%가
57% Fanchin 가 가

(1998)¹⁹ 24%, 37% 12,25
McNamee (1998)²⁰ mock transfer 3

Glass (2000)²¹

가 가

(Visser et al., 36 가

1993)¹, 가

.Nabi (1997)⁵ Tur-Kasp a (1998)⁶

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