



(polyspermy) <sup>2,3</sup> ICSI가

2. 1) (short protocol) 2 GnRH agonist Suprefact® (Hoechst AG, Germany) 3 hMG (IVF-M, LG chemistry, Korea) high-purified FSH (Follimone, LG chemistry, Korea) (flare-up protocol). 7 E<sub>2</sub> (estradiol) 가 18~20 mm hCG (IVF-C, LG chemistry, Korea) 10,000 IU , hCG 36

ICSI가 <sup>4,5</sup> ICSI가 E<sub>2</sub> (estradiol) 가 18~20 mm hCG (IVF-C, LG chemistry, Korea) 10,000 IU , hCG 36

ICSI <sup>6,7</sup> ICSI 3~5 37 30 WHO (1992) 가 15 mL 10% Serum Substitute Supplement (IRVINE, 99193, USA; 10% SSS) Ham's F-10 2 300xG 10 1 mL

1. 0.2 mL 60 swim-up 3 ICSI 3) P-1 (IRVINE, 99242, USA; WHO SSS) 10% SSS 가 ( P-1, +10% SSS) 4~5 80 IU/mL hyaluronidase (Sigma, H-3506) 가 3 P-1 30 (Male factor group). CO<sub>2</sub> ICSI (polar body)가

4) (Nikon, Diaphot, Japan) (Narashige, Japan) x100 . 2 HTF (IRVINE, 9962, USA) 20% SSS 가 24

(Humagen fertility diagnostics, Ins., USA) 5~6 ?m 45° 가 3 (fragmentation) Excel-

(mineral oil) (Falcon 1006, USA) phenol red가 EBSS lent, 20% Good, 20% Poor 48~72

(Gibco, 14015-069, USA) PVP (IRVINE, 99219, USA) 가

6) SAS Ver 6.12 (SAS Institute, USA) Student t-test , ?<sup>2</sup>-test Fisher's exact test p<0.05

5) ICSI 16~18 (+10% SSS) 가 P-1

**Table 1.** The causes of infertility in previous in-vitro fertilization failure group (IVF failure group)

Characteristics	No. of cycle
Tubal factor	4
Ovulatory factor	1
Endometriosis Stage III	2
Unexplained	6
Total	13

**Table 2.** Characteristics of ejaculated semen used in male factor group

Characteristics	No. of cycle
Oligozoospermia	4
Asthenozoospermia	11
Oligoasthenozoospermia	12
Asthenoteratozoospermia	2
Oligoasthenoteratozoospermia	1
Total	30

**Table 3.** Clinical features of both group

	IVF failure group	Male factor group	p-value
No. of patients	6	15	
No. of cycles	13	30	
Age			
Female	36.4 ±3.9	30.4 ±4.8	0.001
Male	38.5 ±7.5	36.3 ±6.3	0.34
Duration of infertility (years)	7.1 ±1.4	5.6 ±2.7	0.07
No. of oocyte recovered	11.1 ±7.4	8.1 ±4.2	0.11
Maximal E <sub>2</sub> level (pg/mL)	3412.6 ±1168.4	2878.0 ±1223.1	0.18

E<sub>2</sub>: estradiol, Values are means ±SD

**Table 4.** Results of ICSI of both group

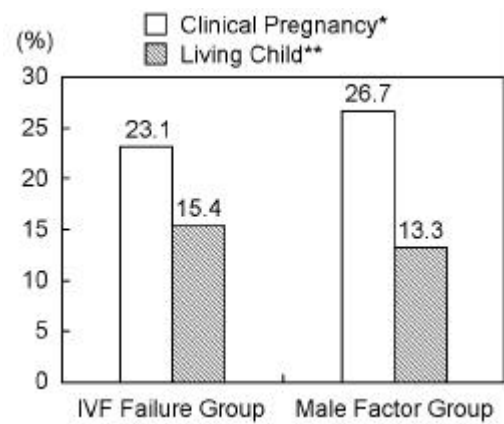
	IVF failure group	Male factor group	p-value
No. of oocytes collected	144	244	
No. of mature oocytes injected	80 (56)	181 (74)	0.001
No. of oocytes fertilized	55 (63)	119 (66)	0.635
No. of oocytes cleaved	55 (100)	111 (93)	0.057
No. of embryo transferred	50	102	
Average no. of embryo per transfer	3.9	3.4	

Values in parentheses are percentages

**Table 5.** Quality of embryo transferred after ICSI

	IVF failure group	Male factor group
No. of blastomere		
3	10 (15)	22 (20)
4~6	45 (85)	85 (77)
7	0 (0)	4 (3)
Morphologic grade		
Excellent	46 (84)	82 (73)
Good	8 (14)	22 (19)
Poor	0 (0)	3 (3)
Arrest	1 (2)	6 (5)

Values in parentheses are percentages



**Figure 1.** Comparison of clinical pregnancy and living child of both group (\*p=0.804, \*\*p=0.858).

가 (Table 3).  
 IVF failure 144, male factor 244. ICSI IVF failure 80, male factor 181, 74% (p=0.001). ICSI IVF failure 55, 63%, male factor 119, 66% (p=0.634). IVF failure 50, 3.9, male factor 102, 3.4 (Table 4).  
 IVF failure 4~6 가 45, 85%, male factor 가 85, 77%.  
 IVF failure Excellent 가 46, 84% Good 가 8, 14% Poor 가 0, 0% Arrest 가 1, 2%  
 IVF failure 가 36.4 ± 3.9, male factor 가 30.4 ± 4.8 (p=0.001).  
 E<sub>2</sub>

가 (Table 3).  
 IVF failure 144, male factor 244. ICSI IVF failure 80, male factor 181, 74% (p=0.001). ICSI IVF failure 55, 63%, male factor 119, 66% (p=0.634). IVF failure 50, 3.9, male factor 102, 3.4 (Table 4).  
 IVF failure 4~6 가 45, 85%, male factor 가 85, 77%.  
 IVF failure Excellent 가 46, 84% Good 가 8, 14%  
 IVF failure 가 36.4 ± 3.9, male factor 가 30.4 ± 4.8 (p=0.001).  
 E<sub>2</sub>

8 14% , male factor Excellent가 82  
73% Good 22 19% (Table 5).  
IVF failure 23.1% , male  
factor 26.7%  
(p=0.804). IVF fai  
lure 15.4%, male factor 13.3%  
가 (p=0.858) (Figure 1).

ICSI가  
mo 8 가 , 1992 Paler-  
ICSI가 26.7% IVF failure 23.1%, male factor 가  
가  $1 \times 10^6$  ICSI  
ICSI가  
ICSI 가  
ICSI 가  
ICSI 가  
ICSI 가  
ICSI가  
factor 66% IVF failure 63%, male  
1998 Tomas 4 ICSI  
65% , 1999 Benadiva 6  
68%, 64%

1996 Gabrielsen 10  
male factor 90%, IVF failure  
82% , male factor  
1999 Benadiva 6  
22.6% 가 ICSI  
20.0% 가  
IVF failure 23.1%, male factor 가  
ICSI  
Lipitz 11  
가 가  
가 ICSI  
가  
IVF failure 36.4  $\pm$  3.9 male factor  
30.4  $\pm$  4.8  
가  
ICSI가

1. Nagy Z, Liu J, Cecile J, Silber S, Devroey P, Van Steirteghem A. Using ejaculated, fresh, and frozen-thawed epididymal and testicular spermatozoa gives rise to comparable results after intracytoplasmic sperm injection. *Fertil Steril* 1995; 63: 808-15.
2. Van Steirteghem AC, Liu J, Joris H, Nagy Z, Janssenswillen C, Tournaye H, et al. Higher success rate by intracytoplasmic sperm injection than by subzonal insemination. Report of a second series of 300 consecutive treatment cycles. *Hum Reprod* 1993; 8: 1055-60.
3. Vanderzwalmen P, Barlow P, Nijs M, Bertin G, Leroy F, Schoysman R. Usefulness of partial dissection of the zona pellucida in a human in-vitro fertilization programme. *Hum Reprod* 1992; 7: 537-44.
4. Tomas C, Orava M, Tuomivaara L, Martikainen H. Low pregnancy rate is achieved in patients treated with intracytoplasmic sperm injection due to previous low or failed fertilization in in-vitro fertilization. *Hum Reprod* 1998; 13: 65-70.
5. Miller KF, Falcone T, Goldberg JM, Attaran M. Previous fertilization failure with conventional in vitro fertilization is associated with poor outcome of intracytoplasmic sperm injection. *Fertil Steril* 1998; 69: 242-5.
6. Benadiva CA, Nulsen J, Siano L, Jennings J, Givargis HB, Maier D. Intracytoplasmic sperm injection overcomes previous fertilization failure with conventional in vitro fertilization. *Fertil Steril* 1999; 72: 1041-4.
7. Svalander P, Forsberg AS, Jkobsson AH, Wikland M. Factors of importance for the establishment of a successful program of intracytoplasmic sperm injection for male infertility. *Fertil Steril* 1995; 63: 828-37.
8. Palermo G, Joris H, Devroey P, Van Steirteghem AC. Pregnancies after intracytoplasmic injection of single spermatozoon into an oocyte. *Lancet* 1992; 340: 17-8.
9. Tesarik J, Sousa M. More than 90% fertilization rates after intracytoplasmic sperm injection and artificial induction of oocyte activation with calcium ionophore. *Fertil Steril* 1995; 63: 343-9.
10. Gabrielsen A, Petersen K, Mikkelsen AL, Lindenberg S. Intracytoplasmic sperm injection does not overcome an oocyte defect in previous fertilization failure with conventional in-vitro fertilization and normal spermatozoa. *Hum Reprod* 1996; 11: 1963-5.
11. Lipitz S, Rabinovici J, Goldenberg M, Bider D, Dor J, Mashiach S. Complete failure of fertilization in couples with mechanical infertility: implications for subsequent in vitro fertilization cycles. *Fertil Steril* 1994; 61: 863-6.