

## 폐쇄성 무정자증과 비폐쇄성 무정자증에서 체외수정기술 후의 임신 결과 비교

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### Comparative Analysis of Pregnancy Outcomes after In Vitro Fertilization with Intracytoplasmic Sperm Injection (IVF-ICSI) between Obstructive and Non-obstructive Azoospermia

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**Objective:** To compare the pregnancy outcomes after in vitro fertilization with intracytoplasmic sperm injection (IVF-ICSI) between obstructive and non-obstructive azoospermia.

**Methods:** From January 1994 to December 2002, 524 patients with obstructive azoospermia (886 cycles) and 163 patients with non-obstructive azoospermia (277 cycles) were included in this study. Microsurgical epididymal sperm aspiration (MESA) or testicular sperm extraction (TESE) in obstructive azoospermia and TESE in non-obstructive azoospermia were performed to retrieve sperm, which was used for ICSI and then fertilized embryos were transferred. The results of ICSI - fertilization rate (FR), clinical pregnancy rate (CPR), clinical abortion rate (CAR) and delivery rate (DR) - were statistically analysed in obstructive versus non-obstructive azoospermia.

**Results:** There were no differences in the number of retrieved oocytes, injected oocytes for ICSI and oocyte maturation rate. FR was significantly higher in obstructive than non-obstructive azoospermia (71.7% vs. 61.1%,  $p < 0.001$ ). There was no difference in CPR per embryo transfer cycle. After pregnancy was established, however, CAR was significantly higher in non-obstructive than obstructive azoospermia (25.6% vs. 12.5%,  $p = 0.004$ ). DR per clinical pregnancy cycle was significantly higher in obstructive than non-obstructive azoospermia (78.0% vs. 64.4%,  $p = 0.012$ ). In the karyotype analysis of abortus, abnormal karyotypes were found in 75.0% (6/8) of obstructive and 55.6% (5/9) of non-obstructive azoospermia.

**Conclusion:** Our data show significantly higher FR in obstructive than non-obstructive azoospermia. Though there was no difference in CPR, CAR was significantly higher in non-obstructive than

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obstructive azoospermia. The abortion may be related to the abnormal karyotype of embryo, but further investigations are necessary to elucidate the cause of clinical abortion in azoospermia.

**Key Words:** Azoospermia, TESE, Fertilization rate, Clinical pregnancy rate, Clinical abortion rate

30~50%  
(intracytopla-  
smic sperm injection, ICSI) .<sup>7</sup> 가 가

가 가 가

(testicular sperm extraction, TESE) 8~11 가 가 가

(microsurgical epididymal sperm aspiration, MESA), 가가 .

(percutaneous epididymal sperm aspiration, PESA) (cli-  
(clinical  
nical pregnancy rate, CPR) (clinical  
abortion rate, CAR) ,

가 가

가 1. 1994 1 2002 12

(TESE)  
(MESA)

(524 , 886 )

(163 , 277 ) hypospermatogenesis,  
Sertoli cell only (SCO) syndrome, maturation arrest  
47,XXY

가 1,2 가 3,4

8.6% 1.7~ 2. 1)<sup>5,6</sup>

, 3% bovine serum albumin (BSA)

, GnRH

immunobead test, 0.4% bovine serum albumin (BSA) 가 Ham's F-10 (Petri dish) 1~2

(microforcep) (squeezing) 가

2) Gonadotropin releasing hormone-agonist (GnRH-a) (long protocol) (short protocol) 6) (Diaphot 300, Nikon, Japan) (NT-88, Narishige, japan)

36 1 0.1% hyaluronidase 8% polyvinylpyrrolidone (PVP) injection pipette (motile sperm) (midpiece) 가 (immobilization) 1

(metaphase II) 1 가 2 3) 0.4% BSA HEPES-buffered T6 medium drop PVP holding pipette 1

(tunica vaginalis) 가 12 6 가 3 가

dle 1 ml 가 24G medicut needle 가 16~20 7) 2~3 12 β-hCG가 5 mlU/ml (pregnacy) (clinical pregnancy) (clinical pregnancy) 20 (clinical abortion) (preterm delivery) 37 (37+0 wk) (term delivery) 37~42 (37+1~ 42+0 wk) (postterm delivery) 42 (42+1 wk) 5) 42 (42+1 wk) 8) mini-Percoll gradient (50~70~100%) swim-up Student's t-test chi-square test (motile sperm) , p<0.05

**Table 1.** Characteristics of patients with obstructive and non-obstructive azoospermia

	Obstructive	Non-obstructive	p-value
No. of patients	524	163	
No. of cycles	886	277	
Male patient age (yr)	38.3±6.8	35.5±4.3	<0.001
Female partner age (yr)	32.9±4.4	32.2±4.1	0.008
Basal FSH (mIU/ml)	7.4±3.0	6.6±2.4	NS
Basal LH (mIU/ml)	3.0±1.8	2.8±1.5	NS
No. of MESA cycles (%)	186 (21.0%)	0	
No. of fresh TESE cycles (%)	441 (49.8%)	226 (81.6%)	
No. of frozen-thawed TESE cycles (%)	259 (29.2%)	51 (18.4%)	

Values: mean ± SD, NS: not significant

가  
82.8% 82.9% 가  
(p=0.01),  
71.7% 61.1%

1,163 (524 , 886 ) (p<0.001).  
(163 , 277 ) 4.3 , 3.8  
가 (p<0.001),

(ovarian reserve) 가  
(Table 2).  
β-hCG 5 mIU/ml hCG  
38.3%,  
1994 1998 37.5% 가  
(MESA)  
186 (CPR) 31.8% 32.5%  
1999 가 (Table 3).  
(TESE)  
, 441 259 23 8.3%  
277 3.9%  
(p=0.006).  
51 25.6%  
12.5% (p=0.004).  
2 30 ( 23

**Table 2.** Outcomes of ICSI cycles in patients with obstructive and non-obstructive azoospermia

	Obstructive	Non-obstructive	p-value
No. of retrieved oocytes	13.5±8.0	14.3±8.1	NS
No. of injected oocytes (MII)	10.9±6.5	11.6±6.5	NS
Oocyte maturation rate (%)	82.8±14.4	82.9±16.1	NS
No. of 2PN embryos	7.6±5.1	6.8±4.8	0.01
Fertilization rate (%)	71.7±22.1	61.1±26.2	<0.001
No. of transferred embryos	4.3±1.9	3.8±1.5	<0.001
Pregnancy (+hCG)/embryo transfers	339/886 (38.3%)	104/277 (37.5%)	NS

Values: mean ± SD, NS: not significant

**Table 3.** Pregnancy outcomes of ICSI cycles in patients with obstructive and non-obstructive azoospermia

	Obstructive	Non-obstructive	p-value
Pregnancy (+hCG) cycles	339	104	
Biochemical pregnancy cycle	58	14	
Clinical abortion cycle	35	23	
Ectopic pregnancy cycle	1	2	
Delivered cycle			
preterm	51	4	
preterm	171	54	
postterm	0	0	
Clinical pregnancies per embryo transfers	281/886 (31.7%)	90/277 (32.5%)	NS
Clinical abortions			
per embryo transfers	35/886 (3.9%)	23/277 (8.3%)	0.006
per clinical pregnancy	35/281 (12.5%)	23/90 (25.6%)	0.004
Deliveries			
per embryo transfers	222/863 (25.7%)	58/270 (21.5%)	NS
per clinical pregnancy	222/281 (79.0%)	58/90 (64.4%)	0.012

NS: not significant

25.7% 21.5% 7 ) . 가 가 (Table 4). 79.0%, (p=0.012) (Table 3). 64.4%

9 8 , 6 5 1993 ,<sup>12</sup>

**Table 4.** Chromosome abnormalities in abortus after ICSI in azoospermic patients

Obstructive	Non-obstructive
47,XX,+13	mos68,XX[23]/69,XX,+mar[18]
47,XY, inv(9)(p11q13),+21	45,X,t(5p;10q)/46,XX,der(5)t(5p;10q)
47,XY,+21[33]/48,XY,+21,+22[16]	47,XX,+3
69,XXX	46,X,+21
47,XX,+13	45,X
47,XX,+22	

가

가

가

가

(PESA)                      가  
(MESA),                      가

1994

1998                      가, Vanderzwalmen                      2.6%,                      22.1%

<sup>14</sup>

Sertoli cell only syndrome                      maturation arrest

가

(MESA)

가                      (multiple TESE)

52.8%

(TESE)                      hypospermatogenesis                      89.2%,

가                      1999                      maturation arrest                      62.5%, Sertoli cell only syn-

drome                      16.3%                      <sup>15</sup>

가                      ,<sup>13</sup>

16

가

Ghazzawi  
 17  
 32~33 (28% vs. 21%)  
 가  
 가 (ovarian reserve) (20% vs. 50%) 21  
 가  
 가  
 2  
 가 (developmental competence)  
 Palermo  
 가 16  
 가 53 255  
 가 (round spermatid) 가 Vernaeve  
 (spermatocyte) (8.6% vs. 12.5%)  
 Mansour Fahmy (17.9% vs. 26.7%)  
 , 18,19 Palermo Kanhraman 22  
 가 16,20  
 Y  
 가  
 Kahraman (1996) 5.1% 가 3.8%, 5  
 1.3% 가 가  
 33.9% 65.3% 가 가  
 , 20 Fahmy (1997) 7.9~23.3%  
 41.2% 57.9% 가  
 19 61.1% 71.7% 1.9~22.1%, 0.6~3.7%  
 6  
 2002 가  
 가 가  
 hCG >5 IU/ml 가 , Silber  
 hCG 가 FISH  
 (CPR)  
 (CAR)





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