폐쇄성 무정자증과 비폐쇄성 무정자증에서 체외수정시술 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 obstrucvtive and non-obstrucvtive 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 ananlysis 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

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30~50%
                                                                                              가
                                                                                                   가
                                     (intracytopla-
smic sperm injection, ICSI)
                                   가
                                                                                                        가
                                                                                                    가
                                                                                     가
                                                          8~11
   (testicular sperm extraction, TESE)
                          (microsurgical epididymal
                                                                    가가
sperm aspiration, MESA),
(percutaneous epididymal sperm aspiration, PESA)
                                                                                                      (cli-
                                      가
                                                        nical pregnancy rate, CPR)
                                                                                                   (clinical
                                                        abortion rate, CAR)
                                                          가
                                                          1.
                    가
                                                                                             (TESE)
                                                                                       (MESA)
                                                                       (524, 886
                                                                                   ) hypospermatogenesis,
                                                                    (163 , 277
                                                        Sertoli cell only (SCO) syndrome, maturation arrest
                                   1,2
  가
                                                                                             47,XXY
                                                          2.
                                             1.7~
                                    5,6
8.6%
                                                          1)
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, 3% bovine serum albumin (BSA)
                      , GnRH
                                                                                        0.4% bovine serum al-
                               immunobead test,
                                                                                 Ham's F-10
                                                          bumin (BSA)
                                                                    (Petri dish)
                                                                                                    1~2
                                                                (microforcep)
                                                                                          (squeezing)
                                                                                                           가
  2)
  Gonadotorpin releasing hormone-agonist (GnRH-a)
            (long protocol)
                                         (short pro-
                                                            6)
tocol)
                                               hCG
                                                                                    (Diaphot 300, Nikon, Japan)
         36
                                                                                       (NT-88, Narishige, japan)
                           0.1% hyaluronidase
                                                                8% polyvinylpyrrolidine (PVP)
                                                                             injection pipette
                              가
                                           2
                                                          (motile sperm)
                                                                                 (midpiece)
        (metaphase II)
                                                          가
                                                                           (immobilization)
  3)
                                                             0.4% BSA HEPES-buffered T6 medium drop
                                                                                       PVP
                                                                                      holding pipette
                                   (tunica vaginalis)
                                                               가 12
                                                                             6
                                                                                3
                           가
                                  24G medicut nee-
                                                                                                            가
dle
              1 ml
                          가
                                                                               16~20
                   가
                                                             7)
                                                                                      2~3
                                                                                     β-hCGフト 5 mlU/ml
                                                                    12
(vasa effrentia)
                                                                           (pregnacy)
                                                                                                         (clin-
  4)
                                                          (gestatinal sac)
                                                          ical pregnancy)
                                                                 20
                                                                (clinical abortion)
   1 cm
                                                          (preterm delivery)
                                                                                   (37+0 \text{ wk})
(tunica albuginea)
                                                                                   37~42 (37+1~ 42+0 wk)
                    0.5 cm
                                                                  (term delivery)
                                                                                          (postterm delivery)
  5)
                                                          42
                                                                (42+1 wk)
                                                            8)
mini-Percoll gradient (50~70~100%)
                                                                              Student's t-test
                                                                                                chi-square test
                                           swim-up
                              (motile sperm)
                                                                           , p<0.05
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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 가 82.8% 82.9% (p=0.01), 71.7% 61.1% (p<0.001). 1,163 (524 , 886) 4.3 , (163 , 277) 3.8 가 (p<0.001), 가 (ovarian reserve) (Table 2). (Table 1). β-hCG hCG 5 mIU/ml 38.3%, 1994 1998 가 37.5% (MESA) 186 (CPR) 31.8% 32.5% . 1999 가 (Table 3). (TESE) , 441 259 23 8.3% 3.9% 277 (p=0.006). 51 25.6% (p=0.004). 12.5% 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. Pegnancy 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	
	preterm	51	4	
Delivered cycle	preterm	171	54	
	postterm	0	0	
Clinical pregnanci	s per embryo transfers 281/886 (31.7%) 90/277 (32.5		90/277 (32.5%)	NS
Clinical bortions	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

, 7)

25.7% 21.5%

. 가 가

79.0%, (Table 4). 64.4% (p=0.012) (Ta-

ble 3).

9 6 5 1993 9 ,¹²

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

Obstructive	Non-obstructive mos68,XX[23]/69,XX,+mar[18]	
47,XX, +13		
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
	(MESA),		가	
(PESA)			, Vanderzwalmen	
		1994	2.6%,	22.1%
1998				.14
			Sertoli cell only synd	
				가
	(MESA)	1		
가			(multiple TESE)	, ,
	(TEGE)	,	1	52.8%
	(TESE)	가 1999	nyposp maturation arrest	ermatogenesis 89.2%, 62.5%, Sertoli cell only syn-
		7[1999		62.5%, Serion cen only syn-
			drome 16.3%	•
가		,13	,	
			16	

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

(CAR)

.23

75.0% (6/8) 55.6% (5/9)
.
フト

가

가 , 가 .

(CAR)

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