

Influence of Sperm Fertilizing Capacity on Embryonic Development and Pregnancy in *In Vitro* Fertilization

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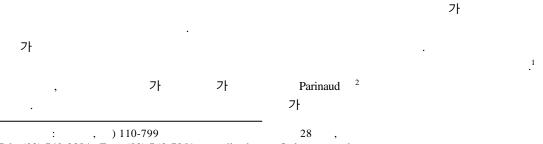
Objectives: To assess the fertilizing capacity using sperm penetration assay (SPA) to predict the outcome of the in vitro fertilization-embryo transfer (IVF-ET) outcome.

Materials and Methods: Semen samples were provided by 129 patients undergoing IVF. We attempted to correlate the extent of sperm penetration under enhanced SPA protocol with the results of fertilization, cleavage, preimplantation embryo development, and pregnancy.

Results: Univariate analysis demonstrated a statistically significant correlation between fertilizing capacity and motility, kinetics, fertilization, cleavage and embryo development, and pregnancy rate. By logistic regression analysis, fertilizing capacity was found to be the only variable that was statistically significant with respect to pregnancy rate. Fertilizing capacity, cleavage rate and pregnant rate were significantly higher in pregnant group. However, the fertilization rates was comparable with both group.

Conclusions: Lower fertilizing capacity could denote a poorer prognosis for establishing a pregnancy, even after satisfactory fertilization rate is achieved.

Key Words: Fertilizing capacity, SPA, IVF-ET



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(<3 \times 10^6/\text{ml})
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                                                              가 swim-up
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                                                           2) Sperm Penetration Assay
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                         sperm penetration assay (
              )가 1976
                         Yanagimachi <sup>5</sup>
  SPA
                          SPA가
                                                           (1)
                        SPA
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                                                         noethane sulfonic acid (TES) 211 mM, hydroxymethyl
                                                         amino methane (Tris) 96 mM, dextrose 11 mM, 1% pe-
                                         가
                                                         nicillin-streptomycin
                                                                                    20%
                                                           가
                             SPA
                                                                   pH 7.4,
                                                                                   290~320 mOsm/kg
                                                               TEST-yolk buffer (
                                                                                     TYB
                                                                                                  )
                                                         1:1
                                                         4
                                                                                   42
                    (fertilizing capacity)
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                           SPA
                                                                    TYB
                                                                                   37
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                                                                        HSA
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                129
                                                           (2)
                                                                 12~16
 2.
  1)
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                                                                                                      1
                GnRH-agonist (
                                    GnRHa
Decapeptyl®, Dtrp-6-LH, Ferring, Malmoe, Sweden)
                                                         PMSG (Sigma G-4877, USA) 35 IU
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Table 1. Comparison with pregnant and non-pregnant group

	Non-pregnant (n=93)	Pregnant (n=36)
Age (female)	33.1 ±3.3	33.5 ±3.5
Age (male)	39.2 ±5.2	38.9 ±5.5
No. of oocytes	602	233
No. of fertilized oocytes	386 (64.1%)	158 (67.8%)
PN	51 (13.21%)	0
2 cell	46 (11.92%)	0
4 cell	157 (40.67%)	103 (65.19%)
8 cell	132 (34.2%)	55 (34.81%)
Fertilizing capacity	6.9 ± 4.6	$11.8 \pm 8.0^*$
Fertilization rate (%)	68.8 ±31.9	71.5 ±22.4
Cleavage rate (%)	61.2 ±33.1	$71.5 \pm 22.6^*$
Well development rate (%)	50.8 ±32.8	71.5 ± 22.4*

^{*}p<0.05, Values: Mean ±SD

, 3	, hCG (Sigma C-		coversli	p			
1063, USA) 35 IU				(metha	anol : glacial	acetic acid=3:	
. hCG 15~16		1)	24		0.25% acetic la		
(cervical dislocation) ,		moid		× 1,000			
	PBS (0.3% HSA						
)가				가			
	(cumulus com-			가			
plex)가 .	0.1% hyaluro-		가				
nidase PBS (0.3% HSA	A)					(pene-	
, 0.1% trypsin	PBS (0.3%	tration in	ndex;		/		
HSA) .		;	PI)	,		
(3)							
2							
가 1 ×10 ⁶ /ml	37 , 5% CO ₂						
10							
0.3% HSA Han	n's F-10 3.5					WHO 10	
					가	. SPA	
(4) ,							
	3						
, (5~10 ?	¹ 1)				가	(Table 1).	
. Coverslip vase-		(Bivariate correlation analysis)			n analysis)		
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	가	netics 1		1 2			

0.30, 0.219	0.205	0.01	가					
0.001			SPA					
		0.365, 0.356		(pene	(penetration index)가			
0.001			I	ROC curve	cut-off	3.0		
		(Multiple regression ana-	가 가	, ,		3.0		
lysis)			98.2%		30%			
		(R=0.213, p<0.001).	.6					
			SPA	1	,			
			,					
			가		SP.	A		
					. Zahalsky	¹⁴ SPA		
	50~80%	10~15%				(Kruger		
		가	morphology)		,			
	.11		SPA					
			,	가				
		가						
				•				
		α.t. μορφ. 12				. SPA		
		(Liu, 1992). ¹²						
. Ron-EL	13 Pair	(male factor)			•			
. 11011 22								
	•	SPA						
			ICSI					
,	,	(capacitation),			가	가		
(acrosome read	ction),	,						
		(decondensation)		가				
					.15,16 S	hibahara ¹⁷		
			SPA			,		
7	L	가				ICSI		
가 ,		TYB		30	0/			
		기 .		30	//0			
		SPA	50)%	26%	•		
				CSI	2370			
		가		가		SPA		

ICSI

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