

Early transient suppression of immune checkpoint proteins T-cell immunoglobulin mucin-3 and programmed cell death-1 in peripheral blood lymphocytes after blastocyst transfer is associated with successful implantation

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Table 1. Demographic characteristics of women included in the study (n=51)

Parameters	Pregnant (n=33)	Non-pregnant (n=18)	P value
Age (years)	34.9±3.2	37.3±1.8	0.007
Body mass index (kg/m ²)	23.5±3.9	22.8±2.7	0.484
Duration of infertility (years)	4.5±3.7	4.8±2.9	0.231
Type of infertility			
Primary	16 (48.5)	10 (55.6)	0.771
Secondary	17 (51.5)	8 (44.4)	
Infertility diagnosis			
Tubal factor	9 (27.2)	4 (22.2)	0.953
Male factor	17 (51.5)	8 (44.4)	
Ovulation disorder	2 (6.1)	2 (11.1)	
Endometriosis	2 (6.1)	1 (5.6)	
Multiple factors	1 (3.0)	1 (5.6)	
Unexplained	2 (6.1)	2 (11.1)	
Baseline FSH (IU/l)	6.7 (5.9~10)	6.5 (4.9~13.3)	0.953
Endometrial thickness (mm) at time of hCG trigger	10.6±2.5	10.1±1.5	0.368
Number of embryos transferred			
1	32 (96.9)	15 (83.3)	0.083
2	1 (3.1)	3 (16.7)	
Cycle type			
Fresh	3 (9.1)	2 (11.1)	0.817

Frozen	30 (90.9)	16 (88.9)	
natural	20 (66.7)	7 (43.8)	0.063
HRT	10 (33.3)	9 (56.2)	

Data are presented with mean ± SD for parametric data, median (range) for non-parametric data and number (%) for categorical variables.

FSH = follicle-stimulating hormone; hCG = human chorionic gonadotropin; HRT = hormone replacement treatment.

Table 2. The changing levels of lymphocyte subsets, Tim-3 and PD-1 expression in lymphocyte subsets after ET

Immune cells Time after ET		NK cells			T cells			NK-like T cells	Tim-3 ⁺ NK cells			Tim-3 ⁺ T cells			Tim-3 ⁺ NK-li ke T cells	PD-1 ⁺ NK cells	PD-1 ⁺ T cells			PD-1 ⁺ NK-lik e T cells
		total NK cells	CD56 ^{dim} NK cells	CD56 ^{bright} NK cells	CD3 ⁺ CD56 ⁻ T cells	CD8 ⁺ T cells	CD4 ⁺ T cells		Total Tim-3 ⁺ NK cells	Tim-3 ⁺ CD56 ^{dim} NK cells	Tim-3 ⁺ CD56 ^{bright} NK cells	Tim-3 ⁺ CD3 ⁺ CD56 ⁻ T cells	Tim-3 ⁺ CD8 ⁺ T cells	Tim-3 ⁺ CD4 ⁺ T cells			PD-1 ⁺ CD3 ⁺ CD56 ⁻ T cells	PD-1 ⁺ CD8 ⁺ T cells	PD-1 ⁺ CD4 ⁺ T cells	
Pregnant	D0	14.51±0.87	94.42±2.21	4.56±0.46	57.40±1.98	35.65±1.42	56.85±1.29	6.20±0.71	34.82±2.03	35.91±2.50	25.58±1.79	3.37±0.32	4.14±0.36	2.91±0.29	3.96±0.51	ND	26.83±1.11	26.53±1.36	26.88±1.15	31.11±1.68
	D3	14.92±1.13	94.31±2.17	4.70±0.38	55.98±1.67	36.62±1.34	56.16±1.29	6.18±0.59	28.59±2.75*	28.76±2.46*	23.51±2.33	2.35±0.33*	2.92±0.33*	1.80±0.26*	2.37±0.28*	ND	25.18±1.18*	25.61±1.61	25.18±1.20*	29.50±1.59
	D6	12.84±1.01	93.76±2.97	4.98±0.43	57.72±2.05	35.40±1.41	57.76±1.32	5.64±0.56	30.62±1.81*	30.89±1.98*	25.54±2.40	2.49±0.25*	3.32±0.34*	1.78±0.18*	2.85±0.39*	ND	24.60±1.12*	24.04±1.52*	25.00±1.14*	29.52±1.55
	D9	13.69±0.93	94.62±2.93	4.48±0.34	56.51±2.12	35.28±1.44	57.25±1.41	6.31±0.71	41.72±2.06*	42.33±2.67*	32.39±2.54*	2.89±0.22	3.52±0.25	2.57±0.19	4.14±0.43	ND	26.04±1.21	25.79±1.49	26.12±1.00	30.08±1.61
Non-pregnant	D0	14.01±0.89	93.66±2.02	5.31±0.55	60.43±1.25	37.66±1.98	56.34±2.07	6.44±0.63	34.01±1.89	34.49±1.97	22.02±1.67	3.08±0.43	3.68±0.48	2.82±0.37	3.15±0.53	ND	26.03±1.37	25.88±1.17	26.11±1.58	27.56±2.44
	D3	13.41±0.86	94.11±1.99	5.27±0.53	60.22±1.39	36.39±1.88	58.22±3.66	6.53±0.74	37.08±3.32	37.53±2.84	25.65±2.64	3.64±0.55	4.18±0.58	3.46±0.46	3.93±0.68	ND	26.77±1.17	26.05±1.11	27.12±1.64	28.96±2.34
	D6	13.47±0.88	94.28±2.18	5.45±0.65	60.73±1.58	36.11±1.71	58.21±2.15	6.23±0.62	37.01±2.62	37.68±2.26	24.57±1.89	3.97±0.53	4.19±0.46	3.65±0.51	4.19±0.49	ND	26.76±1.19	26.52±1.32	26.64±1.65	29.34±2.43
	D9	14.59±1.07	94.61±2.23	4.95±0.51	58.39±3.23	36.69±1.83	57.46±3.66	6.60±0.63	41.83±3.63*	42.17±3.24*	28.11±3.20*	3.16±0.45	3.25±0.45	2.99±0.41	3.11±0.57	ND	25.65±1.18	25.42±1.23	25.86±1.57	28.48±2.36

The results were expressed as the mean value ± standard error of the mean (SEM) (%). ND stands for not detectable. * *P* < 0.05 when compared with D0.

