

High efficient FET is an effective management strategy for patients in high risk of developing OHSS

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Introduction

To investigate the effects of E₂ levels on clinical outcomes of IVF cycles and to assess the efficacy of a D5 frozen embryo transfer program following cancellation of fresh embryo transfers

Material and Methods

All IVF patients in 2008 , 2009 and 2010 including ages of ≤39 years old and endometrium thickness of ≥ 8.5 mm at the day of triggering were pooled.

Stimulation protocols followed the long or the short protocols based on the clinician's decision.

Retrievals were conducted 36 hours after HCG injection.

Recovered eggs were fertilized with ICSI or insemination depending on the parameters of sperm analysis.

The embryos were cultured with the sequential media in 5% O₂, 6% CO₂ at 37 °C. Good qualities of embryos at the day 5 were selected for intrauterine transfer under the ultrasonic guidance.

The remaining blastocysts were frozen by vitrification method following fresh embryo transfer or upon a decision of cancelling embryo transfers due to high risk of developing OHSS or inability to transfer.

In fresh cycles, the outcomes of the embryo development and pregnancy rates were compared among the groups of E₂ level <15000 pmol/ml, 15000-20000 pmol/ml or > 20,000 pmol/ml. The subsequent FET outcomes following cancellation of fresh embryo transfer were examined as well. The differences of the percentages were examined with X² analysis. P<0.05 is considered significantly different.

Results

Table 1. Comparison of IVF outcomes among the groups of patients with different E₂ levels in fresh transfer cycles

E ₂ levels (pmol/ml)	<15,000	15,000-20,000	>20,000	Total
No. of cycles starts	551	85	81	717
Ages	33.17±3.9	33.1±4.6	33.5±3.8	
% of cycles with D5 culture	76(421/551)a	94(80/85)b	100(81/81)b	81(582/717)
% of blastocyst development	56(2112/3749)a	54(496/914)a	57(665/1157)a	56(3273/5820)
% of grade AA blastocysts	47(996/2112)a	47(234/496)a	53(350/665)b	48(1580/3273)
No. of fresh transfer cycles	510	64	25	599
% of β-HCG	63(322/510)a	75(48/64)b	76(19/25)b	65(389/599)

positives				
% of heart beat positives	50(254/510)^a	67(43/64)^b	64(16/25)^b	52(313/599)

The data in rows with different superscripts are different significantly ($p < 0.05$)

Table2. Comparison of FET outcomes among the groups of patients with cancelled fresh embryo transfers

E ₂ levels in fresh cycles pmol/ml	Ages	No. of FET cycles	No. of embryos per transfer	% of β -HCG positives	% of heart beat positives
<15,000	34.15 \pm 3.5	40	1.7	80%(32/40) ^a	68%(27/40)^a
15,000-20,000	33.20 \pm 3.2	20	1.7	90%(18/20) ^a	75%(15/20)^{ab}
>20,000	33.32 \pm 4.0	51	1.8	92%(47/51) ^a	86%(44/51)^b
Total		111	1.7	87%(97/111)	77%(86/111)

The overall gestational pregnancy rates of FET cycles are significantly higher than those of fresh cycles (77% (86/111) vs. 52% (313/599), $P < 0.01$).

Conclusions

- Significantly higher rates of grade AA blastocyst development were obtained in the IVF cycles with E₂ levels of >20,000 pmol/ml.
- Following transfer in fresh cycles, the pregnancy outcomes are better in cycles with E₂ of >15,000 pmol/ml.
- It is possible that the oocytes from the patients with higher E₂ levels acquire better developmental competence during hormonal stimulation.
- We cancelled the fresh transfer cycles for those patients with early onset of OHSS due to high E₂ levels.

Our results showed that subsequent frozen-thawed embryo transfers resulted in significantly better pregnancy outcomes compared to those of fresh embryo transfers, which indicates that freezing all of the transferable embryos is an effective management strategy for patients in high risk of developing OHSS. Furthermore, it is likely that the over stimulation has a negative impact on embryo implantation in fresh cycles.