

Comparison of pregnancy rates following frozen embryo transfer according to the reason for freezing: risk of ovarian hyperstimulation vs inadequate endometrial thickness

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Summary

Purpose: To determine the relative pregnancy rates following frozen embryo transfer according to the reason for deferring fresh embryo transfer and freezing all embryos. **Method:** A retrospective review over a 10-year time period of all in vitro fertilization (IVF) cycles that deferred fresh transfer and cryopreserved all embryos related to risk of ovarian hyperstimulation syndrome or if there was inadequate endometrial thickness. Pregnancy rates according to the reason for freezing were then compared. **Results:** The clinical and live delivered pregnancy rates following frozen embryo transfer in women \leq age 39 was 42.8% and 31.9%, respectively for women deferring for risk of ovarian hyperstimulation syndrome vs 28.7% and 21.8% for those freezing for inadequate endometrial thickness ($p = 0.01$ and $p = 0.07$, respectively). **Conclusion:** Embryo cryopreservation may not be a complete panacea for problems of inadequate endometrial thickness.

Key words: Embryo cryopreservation; Ovarian hyperstimulation; Endometrial thickness.

Introduction

Two reasons for cryopreserving all embryos during in vitro fertilization (IVF) and deferring fresh embryo transfer (ET) is either the risk of ovarian hyperstimulation syndrome (OHSS) or inadequate endometrial thickness at time of peak follicular maturation. Some studies suggest that the frozen/thawed embryos derived from women who hyperstimulate produce normal pregnancy rates and others suggest an inferior pregnancy rate [1, 2].

Though using a graduated oral/vaginal estrogen regimen may increase endometrial thickness, sometimes it does not and the ET occurs despite inferior endometrial thickness. Lower pregnancy rates are found with thin endometria in the late proliferative phase [3].

The objective of this study was to evaluate the efficacy of a modified slow cool embryo freezing technique and at the same time evaluate the effect of deferring ET and cryopreserving all embryos because of risk of OHSS vs cryopreservation for inadequate endometrial thickness.

Materials and Methods

A retrospective study over a 10-year time period was conducted. A requirement was that the source of the embryos were from women who deferred fresh ET either for risk of OHSS or inadequate endometrial thickness in the late proliferative phase on the day of human chorionic gonadotropin (hCG).

A modified slow cool cryopreservation technique was employed in which the programmable freezer was replaced by a rate controlled alcohol bath freezer [4]. A simplified thawing procedure removed the cryoprotectant, 1,2 propanediol, in one

step [4]. Assisted embryo hatching was performed on day 3 embryos prior to transfer [5].

Deferring fresh ET with cryopreservation of all embryos was performed for a serum estradiol > 5000 pg/ml or > 25 follicles of ≥ 12 mm average diameter or endometrial thickness of ≤ 7 mm on the day of hCG injection. Women with endometrial synechiae were excluded.

Results

Pregnancy rates for frozen ET in patients whose fresh transfer was deferred is shown in Table 1. For women ≤ 39 years of age, the clinical pregnancy rate (PR) following frozen ET for those deferring fresh ET for OHSS was 42.8% (389/893) vs 28.7% (25/87) for thin endometria (chi-square analysis showed $p = 0.01$). The live delivered PRs were 31.9% (285/893) vs 21.8% (19/87) ($p = 0.07$, chi-square analysis).

Discussion

The lower pregnancy rate for those deferring fresh transfer for thin endometria vs those deferring for risk of OHSS can be partially explained by still failing to attain adequate endometrial thickness despite a graduated estrogen regimen. These data show that attaining an adequate endometrial thickness is important not just for controlled ovarian hyperstimulation (COH) cycles with fresh ET but also for frozen ET without COH.

These data also show that a graduated oral estrogen regimen in lieu of COH is not necessarily a panacea for inadequate endometrial thickness on COH cycles.

Purposeful cryopreservation for risk of OHSS is performed much more commonly than for thin endometria.

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Table 1. — Pregnancy rates following frozen ET according to reason for deferring fresh ET.

	Deferred for OHSS		Deferred for Poor Lining	
	≤ 35	36-39	≤ 35	36-39
Age				
# transfers	746	147	52	35
% pregnant/transfer (chemical)	50.9	36.1	40.4	34.3
% clinical/trans (ultrasound at 8 weeks)	44.9	32.7	28.8	28.6
% viable/transfer (12 weeks)	40.8	29.3	25.0	25.7
% delivered	38.2	27.2	21.2	22.9
Avg. # embryos transferred	3.1	3.7	2.9	3.5
Implantation rate (%)	22.2	13.5	15.1	9.0

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