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Title:

HISTOPATHOLOGICAL EVALUATION OF PLACENTAS FROM PREGNANCIES RESULTING FROM FRESH VERSUS FROZEN EMBRYO TRANSFERS

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Background:

Frozen-thawed embryo transfer (FET) cycles appear to result in better clinical pregnancy rates and obstetrical outcomes compared to fresh ET. Controlled ovarian hyperstimulation alters the hormonal environment of the endometrium, which in theory could interfere with normal gene expression and creation of an optimal window of implantation. Abnormal placentation and impaired angiogenesis in early gestation could in turn lead to developmental programming sequelae including intrauterine growth restriction and long term health consequences for offspring. Synthetic preparation for FET is designed to mimic the natural cycle and approximate the normal physiological state and potentially result in improved neonatal outcome.

Objective:

To compare birth weights and placental abnormalities in fresh versus frozen embryo transfer cycles resulting in live singleton gestation.

Materials and Methods:

Patients with complete obstetric and placental pathology records who achieved a live singleton birth from fresh and frozen-thaw SETs during November 2002 to October 2015 were included in this retrospective cohort analysis. Abnormal histological findings were categorized into 5 groups: thrombotic (villous ischemia, infarcts, mural thrombi), inflammatory (chorioamnionitis, umbilical phlebitis, villitis), structural (chorioangiogenesis, abnormal cord insertions, single umbilical artery), hemorrhagic (retroplacental hematoma, intervillous hemorrhage), and morbidly adherent (accreta).

Result(s):



A total of 81 patients were included in the study. No significant difference between birth weights and placental pathology in infants born from fresh (n= 45) versus frozen (n=36) SET.

Table 1:

	Fresh SET	Frozen SET	P value
Placental pathology available	45	36	
Endometrial thickness at transfer	8.9 ± 1.7	9.1 ± 2.4	NS
Placental weight	434.6 ± 141.7	443.4 ± 135.0	NS
Placental weight percentile	34.0 ± 38.6	23.3 ± 32.6	NS
Birthweight	2895.4 ± 731.9	2973.1 ± 761.1	NS
Low birth weight <2500g	20.0% (9/45)	19.4% (7/36)	NS
Correlation of placental to birth weight	r=0.52 p=0.0004	r=0.55 p=0.0006	
EFW 18-20 wks	355.7 ± 129.7	331.2 ± 104.3	NS
EFW 24 wks	633.2 ± 154.1	744.0 ± 103.2	0.08
EFW 32 wks	1958.6 ± 490.9	2056.9 ± 342.7	NS
Thrombotic	62.2% (28/45)	50.0% (18/36)	NS
Inflammatory	42.2% (19/45)	38.9% (14/36)	NS
Structural	20.0% (9/45)	16.7% (6/36)	NS
Hemorrhagic	11.1% (5/45)	5.6% (2/36)	NS
Adherent	6.7% (3/45)	2.8% (1/36)	NS
No histological abnormality	11.1% (5/45)	27.8% (10/36)	0.06

Conclusion(s):

Despite a subtle increase in growth based on EFW at 24 weeks gestation (744.0±103.2g vs. 633.2±154.1g, p=0.08), FET cycles were associated with birth weights at term comparable to those seen in fresh cycles. A trend towards increased histological abnormalities in placentas from fresh SET is consistent with previous studies and could be explained by supraphysiological estradiol levels occurring when embryos are transferred following controlled ovarian hyperstimulation in a fresh cycle. To our knowledge, this is the first study to directly compare placental pathology in pregnancies resulting from fresh versus frozen SET. Our findings can be



used to inform clinical decision-making regarding both methods for SET, and to promote the efficacy of FET in improving obstetrical outcomes.