VITRIFICATION, MORPHOLOGY AND SINGLE EUPLOID BLASTOCYST OUTCOMES

J.-H. Tsai, J. Lim, T. Han, J. Graham, M. Tucker
Shady Grove Fertility Reproductive Science Center, Rockville, MD, USA

Objective: Preimplantation genetic screening (PGS) has been increasingly used to identify euploid embryos. The present study evaluated clinical outcomes of PGS IVF cycles with transfer of a single blastocyst assessed as euploid by day 5 (D5) trophectoderm biopsy followed by either frozen embryo transfer (FET) or day-6 (D6) fresh transfer during 2013-2015. We further evaluated whether blastocyst morphology correlated outcomes.
Design: Retrospective study.
Materials and Methods: 348 single embryo transfers of euploid blastocysts after analysis of D5 trophectoderm biopsy were analyzed. Embryo morphology (AA, AB, BA and BB) was scored prior to trophectoderm biopsy. Comparative genomic hybridization array, qPCR or SNP array were used for PGS. Transfer was performed either on D6 (fresh) or following vitrification and warming. Implantation (IR), ongoing/delivered (OGD), and spontaneous abortion (SAb) rates were compared by t-test. Statistical significance was defined as $P < 0.05$. Ongoing pregnancies were those with fetal cardiac activity at or beyond 8 weeks gestational age.
Results: There were 278 cycles in which D5 biopsy was followed by FET and 70 cycles with D5 biopsy followed by D6 fresh transfer. Though all outcomes analyzed favored FET, no statistically significant differences were found for FET vs. fresh D6 transfer for IR (P=0.37), OGD (P=0.36), or SAb (P=0.78). Also no statistically significant differences in outcomes were associated with blastocyst morphology (Table).

	N	**IR sacs (%)**	**OGD OG/D (%)**	**SAb (losses /CP;%)**
D5 BX/FET	**278**	**175 (62.9)**	**152 (54.7)**	**21/173 (12.1)**
AA grade	99	**59** (59.6)	**50** (50.5)	**8/58** (13.8)
AB grade	155	**103** (66.5)	**91** (58.7)	**11/102** (10.8)
BA grade	11	**6** (54.5)	**5** (45.5)	**1/6** (16.7)
BB grade	13	**7** (53.8)	**6** (46.2)	**1/7** (14.3)
D5 BX/D6 ET	**70**	**40 (57.1)**	**34 (48.6)**	**4/38 (10.5)**
AA grade	37	**19** (51.4)	**16** (43.2)	**2/18** (11.1)
AB grade	29	**18** (62.1)	**16** (55.2)	**1/17** (5.9)
BA grade	3	**3** (100.0)	**2** (66.7)	**1/3** (33.3)
BB grade	1	**0** (0)	**0** (0)	N/A

Conclusions: FET and fresh D6 transfer of single euploid blastocysts showed similar IR, OGD and SAb rates. Similarly, transfers of AA grade blastocysts had similar outcomes to those of lower grade, suggesting that morphology may be a less critical parameter for PGS euploid blastocyst transfers. Given the lack of advantage of D5 biopsy with fresh D6 transfer, we recommend vitrification with subsequent FET after PGS biopsy. This practice further enables trophectoderm biopsy and PGS of embryos that reach the blastocyst change on D6/D7.
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