Euploidy Status and Single Embryo Transfer Success is Independent of Day 5 and Day 6 Blastocyst Development.

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INTRODUCTION

Early embryo aneuploidy is widely accepted as a major reason of implantation failures. The goal of many IVF programs is to offer high success without the risk of multiple gestations through single embryo transfers (SET). The use of Preimplantation Genetic Screening (PGS) is considered a valuable ART tool to help clinicians choose only top quality, genetically euploid embryos for SET.

Experimental Questions

Are there differences in euploidy rates between Day 5 and Day 6 blastocysts? Does the day of blastocyst development predict implantation or ongoing/live birth rates in single euploid vitrified blastocyst transfers?

EXPERIMENTAL DESIGN & METHOD

Euploidy was determined through PGS/vitrification-all cycles with biopsy between 1/1/2012 and 12/31/2013, resulting in 244 cycles and 1259 blastocysts. All blastocysts were biopsied on Days 5 or 6 and required a 3BB or better grade. Pregnancy results were based on 108 (average age: 35.6) vitrified-warmed single euploid embryo transfers.

Patients autonomously chose PGS-trophectoderm biopsy/vitrification-all cycles. Embryos were laser hatched on Day 3 and herniating blastocysts were biopsied (quality grade 3BB or better) on Day 5 or 6. Euploidy results were determined on every patient enrolled and pregnancy outcomes were based on non-donor, single embryo transfers only.

RESULTS

Day 5 euploidy rate (50.4%) showed no difference (p=0.56) compared to Day 6 (48.6%). No significance was observed with SET ongoing/live birth for Day 5 at 75.4% versus Day 6 at 72.1% (p=1.00). Furthermore, the data revealed no differences in Day 5 and Day 6 implantation rates (83.6% versus 83.7%; p=0.798). There was a trend toward increased spontaneous abortions, %SAB, with Day 6 blastocysts being 13.9% compared to 4.2% for Day 5 (p=0.13). Age stratification of the data reveals no significant differences, although a majority of our Day 6 SABs did occur in the 35-37 year old age group where 91.7% produced a viable sac, but only 53% sustained the pregnancy. Physiologic patient variation is likely a more critical factor than age in influencing pregnancy outcomes.

DISCUSSION

Advanced growing blastocysts have long been thought to have higher euploidy and success rates. This study indicates that when corrected for aneuploidy, day of blastocyst development does not influence success. The trend we observed with higher SAB rates with Day 6 embryos appeared correlated to "B quality" TE grades (subject of a separate Oral presentation). With a demand for high SET take home baby rates, the need to better assess blastocysts beyond quality grades and developmental pace is necessary to increase IVF success. The perceived emphasis for faster growing embryos places higher importance for transferring Day 5 blastocysts versus Day 6 when equal quality blastocysts are available. A prospective randomized trial could eliminate this perceived importance and correct for embryologist bias in the future. Overall, our goal at SCCRM / SCIIRS is “One embryo – One baby” ™.