PREIMPLANTATION GENETIC SCREENING (PGS) IN LOW RESPONDERS SHORTENS TIME TO LIVE BIRTH: A RANDOMIZED CONTROLLED TRIAL

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OBJECTIVE: Human aneuploidy contributes to poor reproductive outcomes and this effect increases with age. There are class I data for the use of PGS in normal responders which show improved reproductive outcomes. However, there are no class I data employing blastocyst culture and PGS in poor responders. This interim analysis seeks to determine if patients who are at risk for poor response have a shorter time to live birth when employing PGS.

DESIGN: Randomized Controlled Trial

MATERIALS AND METHODS: Patients screened for enrollment between 2013 and 2016 were expected to be poor responders by having either and AMH level of <1.1 ng/mL within the past year or a total basal antral follicle count of <8. Patients with a history of endometrial insufficiency and those with BMI ≥35 kg/m2 were excluded. Patients underwent IVF treatment per routine protocol and were block randomized by age at the time of blastocyst formation by the embryology team utilizing serially numbered opaque envelopes. The treatment group had trophectoderm biopsy, PGS, and fresh or frozen euploid embryo transfer. The control group underwent fresh or frozen unscreened blastocyst transfer. The primary outcome was time to live birth. Secondary outcomes included clinical loss and ongoing aneuploid pregnancies. Life table analyses and Kaplan-Meier survival curves were employed for the primary outcome and Chi-square analysis for secondary outcomes.

RESULTS: There were 181 patients enrolled and 128 underwent randomization with designated outcome of live birth, completed study protocol, drop out of care, and ongoing treatment. The mean age was 37.4 (±3.3) in the control group and 37.1 (±2.9) in the PGS group; mean AMH was 0.59 (±.28) ng/mL and 0.68 (±0.41); and mean AFC was 8.2 (±2.4) and 8.0 (±2.4) respectively with no statistically significant differences between groups. When time to live birth was analyzed, there were 69 total deliveries, 37 in the control and 32 in the PGS groups. Randomization to PGS resulted in significantly less time to live birth from a mean of 301 days in the control group to 209 days in the PGS group (p=0.02). There were 18 clinical loses, 5 in the PGS group and 13 in the control group (p=0.079). This included two instances of termination of pregnancy for a trisomy 18 and a trisomy 13 pregnancy in the control group.

Conclusions: PGS significantly decreased time to live birth by an average of three months in patients with diminished ovarian reserve. Further, PGS appears to have a decreased risk for ongoing aneuploid gestations as compared to standard IVF, as there were two terminations required for trisomic gestations in the control group. Offering this embryonic screening paradigm to these patients serves as a way to decrease time to live birth and may decrease the risk of clinical miscarriage and abnormal ongoing gestations.