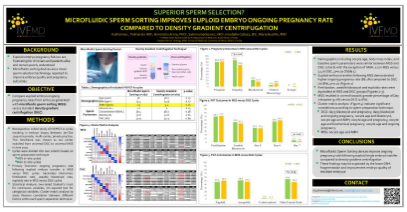
Track: ART - LAB

Poster Session: ART Lab: Outcome Predictors

(P-45) SUPERIOR SPERM SELECTION? MICROFLUIDIC SPERM SORTING IMPROVES EUPLOID EMBRYO ONGOING PREGNANCY RATE COMPARED TO DENSITY GRADIENT CENTRIFUGATION

Saturday, October 17, 2020 4:30 PM – 6:00 PM



Author(s)

Katherine L. Palmerola

Reproductive Endocrinologist
IVFMD, South Florida Institute for Reproductive Medicine
MIAMI, Florida

Objective: Euploid embryo pregnancy failures are frustrating for clinicians and patients alike and remain a poorly understood aspect of infertility. Novel sperm selection techniques using microfluidic sorting devices are reported to improve embryo quality and pregnancy outcomes, though existing data is limited by small sample size. This study aims to compare euploid embryo ongoing pregnancy rates from embryos generated with the use of microfluidic sperm sorting (MSS) versus standard density gradient centrifugation (DGC). **DESIGN:** Retrospective cohort study **MATERIALS AND**

Methods: All IVF/PGT-A cycles resulting in embryo biopsy between January and October 2019 at a large, multicenter, private practice were included in analysis. Our center transitioned to use of MSS devices for all IVF cycles mid-way through this time period. PGT-A cycles were divided into two cohorts based on sperm preparation technique prior to ICSI: MSS (n = 167 cycles) and DGC (n = 167 cycles). Primary outcome was ongoing pregnancy rate following euploid embryo transfer. Secondary outcomes included fertilization rate, biopsiable blastocyst rate, and euploidy rate. Statistical analysis included two-tailed Student's t-test for continuous variables and Chi-square test for categorical variables, with $p < 0.05$ defining statistical significance.

Results: Demographics, including oocyte age, body mass index, and baseline sperm parameters, were similar between MSS and DGC cohorts with the exception of AMH: mean 2.5 ng/mL in MSS versus 3.4 ng/mL in DGC, p=0.01. Euploid embryo transfers following MSS demonstrated higher ongoing pregnancy rate (86.1%) compared to DGC (70.8%), p=0.02 (Table 1). Fertilization, biopsiable blastocyst and euploidy rates were equivalent in MSS and DGC groups. Of note, MSS resulted in a trend towards greater percentage of Day 7 biopsies (5.1%) versus DCG (2.6%). Table 1. MSS versus DGC Primary & Secondary Outcomes

	Microfluidic Sperm Sorting (MSS)	Dens
Fertilization Rate (%)	69.7	71.5
Biopsiable Blastocyst Rate (%)	54.8	51.2
Euploidy Rate (%)	47.4	50.2
Pregnancy Rate (%)	80.9	82.3
Ongoing Pregnancy Rate (%)	86.1	70.8
Biochemical Pregnancy Rate (%)	22.2	16.7
Clinical Miscarriage Rate (%)	5.6	10.4

Conclusions: Despite equivalent fertilization, embryo progression, and euploidy rates, microfluidic sperm sorting results in a higher ongoing pregnancy rate following euploid embryo transfer compared to standard density gradient centrifugation. Our findings may be explained by the lower DNA fragmentation and hence improved embryo quality of resultant embryos.