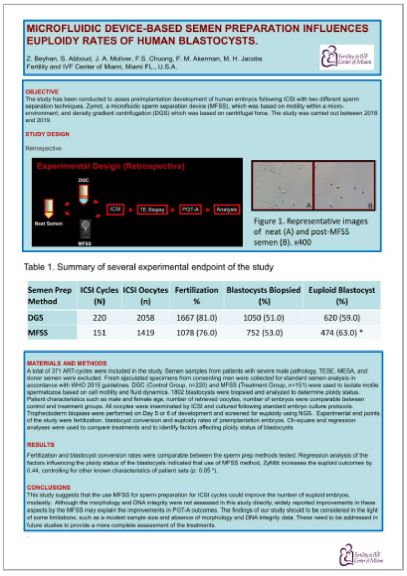
Track: ART - LAB

Poster Session: ART Lab: Outcome Predictors

(P-48) MICROFLUIDIC DEVICE-BASED SEMEN PREPARATION INFLUENCES EUPLOIDY RATES OF HUMAN BLASTOCYSTS.

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


MICROFLUIDIC DEVICE-BASED SEMEN PREPARATION INFLUENCES EUPLOIDY RATES OF HUMAN BLASTOCYSTS.

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OBJECTIVE
The study has been conducted to asses preimplantation development of human embryos following ICSI with two different sperm separation techniques. Zymot, a microfluidic sperm separation device (MFSS), which was based on motility within a micro-environment, and density gradient centrifugation (DGS) which was based on centrifugal force. The study was carried out between 2018 and 2019.

STUDY DESIGN
Retrospective

Experimental Design (Retrospective)

Figure 1. Representative images of neat (A) and post-MFSS semen (B). x400

Table 1. Summary of several experimental endpoint of the study

Semen Prep Method	ICSI Cycles (N)	ICSI Oocytes (n)	Fertilization %	Blastocysts Biopsied (%)	Euploid Blastocyst (%)
DGS	220	2058	1667 (81.0)	1050 (51.0)	620 (59.0)
MFSS	151	1419	1078 (76.0)	752 (53.0)	474 (63.0) *

MATERIALS AND METHODS
A total of 371 ART-cycles were included in the study. Semen samples from patients with severe male pathology, TESE, MESA, and donor semen were excluded. Fresh ejaculated specimens from consenting men were collected for standard semen analysis in accordance with WHO 2015 guidelines. DGC (Control Group, n=220) and MFSS (Treatment Group, n=151) were used to isolate motile spermatozoa based on cell motility and fluid dynamics. 1802 blastocysts were biopsied and analyzed to determine ploidy status. Patient characteristics such as male and female age, number of retrieved oocytes, number of embryos were comparable between control and treatment groups. All oocytes were inseminated by ICSI and cultured following standard embryo culture protocols. Trophectoderm biopsies were performed on Day 5 or 6 of development and screened for euploidy using NGS. Experimental end points of the study were fertilization, blastocyst conversion and euploidy rates of preimplantation embryos. Chi-square and regression analyses were used to compare treatments and to identify factors affecting ploidy status of blastocysts

RESULTS
Fertilization and blastocyst conversion rates were comparable between the sperm prep methods tested. Regression analysis of the factors influencing the ploidy status of the blastocysts indicated that use of MFSS method, ZyMot increases the euploid outcomes by 0.44, controlling for other known characteristics of patient sets (p: 0.05 *).

CONCLUSIONS
This study suggests that the use MFSS for sperm preparation for ICSI cycles could improve the number of euploid embryos, modestly. Although the morphology and DNA integrity were not assessed in this study directly, widely reported improvements in these aspects by the MFSS may explain the improvements in PGT-A outcomes. The findings of our study should to be considered in the light of some limitations, such as a modest sample size and absence of morphology and DNA integrity data. These need to be addressed in future studies to provide a more complete assessment of the treatments.

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