AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE
2022 SCIENTIFIC CONGRESS & EXPO

A RETROSPECTIVE ANALYSIS OF CHYMOTRYPSIN USE FOR IVF SPERM PREPARATION ANDITS EFFECTS ON FERTILIZATION, BLASTULATON AND PLOIDY

David L. Shelley, Carlos Hernandez-Nieto, Dmitry Gounko, Joseph A. Lee, Natan Bar-Chama, Rose Marie Roth, Christine Briton-Jones, Alan B Copperman, Richard E. Slifkin

1. Reproductive Medicine Associates of New York, New York, NY
2. Icahn School of Medicine at Mount Sinai, New York, NY

OBJECTIVE:

Previously published research about chymotrypsin treatment has shown no effect on sperm motility or viability, yet, there remains a paucity of data on its association with fertilization, blastulation, and ploidy. This study evaluated whether there is a latent effect on IVF outcomes in patients in whom chymotrypsin treatment is used in IVF for sperm preparation.

MATERIALS AND METHODS:

The study included patients at a single, academic center who underwent IVF treatment from 2016 to2022. Preimplantation Genetic Testing for Aneuploidy (PGT-A) with next generation sequencing(NGS) was performed after trophectoderm (TE) biopsy. Insemination of fresh oocytes was conducted via intracytoplasmic sperm injection (ICSI). Study patients utilized chymotrypsin treatment due to high seminal viscosity. Control patients did not require use of chymotrypsin. Only patients with fresh ejaculate and a total count of ≥ 30 million total motile were included in the analysis. Patients with recurrent pregnancy loss (RPL), recurrent implantation failure (RIF) and/or chromosomal rearrangements were excluded from the analysis. Baseline demographic characteristics, hormonal profiles, ovarian stimulation parameters, oocyte quality, fertilization rates, blastulation rates, and embryo ploidy rates were compared between cohorts. Comparative statistics and a logistic regression analysis adjusting for potential confounders was performed. A sample size of 329patients per cohort was calculated to ensure an 80% power to detect a difference of 10% on fertilization rates (α=0.05). A sub analysis for all cohorts included assessment of pregnancy outcomes after a single euploid embryo transfer on a synthetic endometrial preparation cycle.

RESULTS:

Differences in oocyte age, AMH, male age, total sperm count, and total gonadotropin dosage were found among cohorts. No differences were found in number of stimulation days, peak estradiol during COH, mean oocytes retrieved, and mean M2 oocytes. Oocyte maturity rates, fertilization, blastulation, and euploidy rates were comparable between cohorts. Mosaicism was significantly higher in the control group. In a multivariate logistic regression analysis adjusted for oocyte age, AMH, gonadotropin dose, partner's age, and total sperm count; no association was found between chymotrypsin use and odds of fertilization (aOR 0.9 CI95% 0.8-1.09), blastulation rate (aOR 1.006 CI95% 0.8-1.13),euploidy rate (aOR 0.98 CI95% 0.8-1.1), or rates of mosaicism (aOR 0.85 CI95% 0.5-1.2). Sub-analysis found no differences among controls and patients who utilized chymotrypsin in implantation(73% vs 74% p=0.83), clinical pregnancy (62% vs 62% p=0.82), live birth (52% vs 50% p=0.64), and clinical pregnancy loss rates (11% vs 11% p=0.68).

CONCLUSIONS:

No significant effect was observed on fertilization, blastulation and embryo ploidy rates in patients who utilized chymotrypsin treatment for sperm preparation.

IMPACT STATEMENT:

Chymotrypsin appears to be safe and efficient in sperm preparation for IVF cycles.

REFERENCES:

N/A