77th ASRM Scientific Congress & Expo

October 16-20, 2021 // Baltimore, MD, USA

ELEVATED SPERM DNA FRAGMENTATION DOES NOT RESULT IN INCREASED PREGNANCY LOSS RATES AFTER SINGLE, EUPLOID FROZEN EMBRYO TRANSFER

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OBJECTIVE: Some authors have proposed a relationship between high sperm DNA fragmentation (SDF) and impaired in-vitro fertilization (IVF) outcomes, including poor fertilization, decreased embryo quality, and increased risk of early pregnancy loss.[1] Theoretically, sperm DNA damage may cause chromosomal aberrations, delayed cell cleavage and defective cellular processes, leading to reduced embryo quality and/or early pregnancy loss of chromosomal unscreened embryos. To date, no peer reviewed publications has explored the relationship between high SDF and miscarriage after euploid embryo transfer. The aim of this study is to evaluate if high SDF is associated with an increased rate of spontaneous abortion after a single, euploid frozen embryo transfer (FET).

MATERIALS AND METHODS: The study included all single, euploid FET cycles in which Sperm DNA Fragmentation Index (DFI) was analyzed from 2016 to 2020. DFI was calculated using sperm chromatin dispersion, acridine orange, TUNEL or sperm chromatin structure assays. Patients were segregated into 2 groups: normal DFI rate (≤30%) and elevated DFI rate (≥30%). Frozen/thawed semen samples and patients with recurrent pregnancy loss diagnosis were excluded from the analysis. Demographic characteristics of populations, clinical embryology parameters, and clinical loss rate (CLR) were assessed. Comparative statistics and multivariable logistic regression were used.

RESULTS: Of the total 330 single, euploid FET cycles that were included in the study, 167 cases involved elevated DFI and 163 cases had normal DFI. A significant difference was found in the mean age of men between cohorts (37.5 ±5 years old, 36.4±4 years old, p=0.043) respectively. No differences were found in the remaining demographic characteristics, number of good quality embryos transferred (≥4BB Gardner's) and CLR (15.3% vs 17.3%, p=0.61). After adjusting for female and male patient's age, BMI, AMH, and embryo grade there was no association with elevated DFI and higher odds of CPL (OR 0.96, CI 95% 0.6-1.3, p=0.85).

CONCLUSIONS: Although multiple studies have reported poor outcomes in patients with elevated DFI, our study demonstrated that elevated DFI does not appear to increase pregnancy loss rates after a single, euploid FET. Patients with elevated DFI can be reassured that once a pregnancy has been achieved, they have similar pregnancy outcomes compared to those without normal DFI.

IMPACT STATEMENT: Elevated DFI does not increase miscarriage rates after a single, euploid frozen embryo transfer.

REFERENCES:

1. Zhao J, Zhang Q, Wang Y, Li Y. Whether sperm deoxyribonucleic acid fragmentation has an effect on pregnancy and miscarriage after in vitro fertilization/intracytoplasmic sperm injection: a systematic review and metaanalysis. Fertil Steril 2014; 102:998–1005.