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HUMAN ZYGOTES RESPOND TO SPERM DNA DAMAGE BY DELAYING EMBRYONIC DEVELOPMENT.

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Baseline Demographics and Cycle Characteristics for Embryos with High Quality (A/B) vs. Low Quality High TE Grade (n¼40,945) Low TE Grade (n¼23,992) P Value Male Partner Age (y) 39.1 _ 5.2 39.7 _ 5.3 0.04 Female Partner Age (y) 34.7 _ 4.4 35.5 _ 4.6 <0.0001 SA Concentration (million sperm) 64.6 _ 49.9 64.0 _ 49.5 0.14 % Motility 53.0 _ 17.6 52.8 _ 17.4 0.29 % Morphology - Normal Abnormal 25,632 (69.9%)/ 11,054 (30.1%) 14,857 (69.2%)/ 6623 (30.8%) 0.08 Oligospermia 3809 (9.3%) 2097 (8.7%) 0.15 Insemination Type - Conventional - ICSI Split 10,203 (20.8%)/ 29, 406 (71.8%)/ 1336 (3.3%) 4983 (20.8%)/ 18,343 (76.5%)/ 666 (2.8%) <0.0001 Sperm Source - Fresh Ejaculate - Frozen Ejaculate Testicular 20,794 (86.7%)/ 2570 (10.7%)/ 628 (2.6%) 35,608 (87.0%) /4250 (10.4%)/ 1087 (2.7%) 0.40 % Biopsied for PGT 17,386 (42.2%) 7829 (32.6%) <0.0001 % Re-biopsied 476 (2.7%) 184 (2.35%) 0.07 Euploid Embryo 9692 (55.8%) 2984 (38.1%) <0.0001 e92 ASRM Abstracts Vol. 110, No. 4, Supplement, September 2018 OBJECTIVE: Time-lapse monitoring (TLM) technology has been implemented in the clinical setting for the culture and selection of human embryos. Little is known about the effect of male gamete on the embryo division timings, but some experiments performed on mouse zygotes showed that sperm DNA damage elicits a specific mechanism to slow early embryonic progression (1). The main goal of this study was to evaluate the correlation between sperm DNA fragmentation (sDNAf), male age and embryo kinetics parameters.

DESIGN: Prospective, non-interventional study.

MATERIALS AND METHODS: Embryonic TLM data was obtained for 631 embryos from 61 couples undergoing ART at an academic fertility center. To minimize the effect of any female factor infertility, only couples enrolled in an oocyte donation program were included. Fresh ejaculated samples were evaluated according to the WHO criteria and processed through density gradients. The aliquot used to perform the ICSI was analyzed by flow cytometry TUNEL assay to measure the level of sperm DNA fragmentation. The fertilization process and embryo development were assessed through an EmbyoScope_ (Vitrolife) time-lapse system until D+5 of development. Association between sDNAf, male age and morphokinetic parameters was investigated using the Pearson correlation coefficient. RESULTS: Mean age of males was 41.10 (95% IC 39.40-42.80) and mean sDNAf was 14.13 (95% IC 11.68-16.58). When the effect of DNA damage was analyzed, we found a significantly positive correlation between sDNAf and both time of second polar body extrusion (tPB2) (r¼0.02, p¼0.015) and

time of pronuclear appearance (PNa) (r¼0.09, p¼0.034). The remaining morphokinetic variables were not related with sperm DNA damage. Regarding paternal age, we did not find any relationship between paternal age and any morphokinetic parameters but observed a clear positive relationship with sDNAf (r¼0.303, p¼0.0001).

CONCLUSIONS: According to our study, sperm DNA fragmentation is affecting the timing necessary to resume meiosis (defined by 2PB extrusion) and the initiation of S-phase of first embryo cell cycle (defined by the PNa). Further basic studies may be necessary to understand the molecular processes that may condition our observations. References: 1. Gawecka JE, Marh J, Ortega M, Yamauchi Y, Ward MA, Ward WS. Mouse zygotes respond to severe sperm DNA damage by delaying paternal DNA replication and embryonic development. PLoS One. 2013;8(2):e56385. Supported by: None.