77th ASRM Scientific Congress & Expo

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

CLEAVAGE STAGE MORPHOLOGY IS NOT ASSOCIATED WITH THE IMPLANTATION POTENTIAL OF SCREENED BLASTOCYSTS

Carlos Hernandez-Nieto, MD, Joseph A. Lee, BA, Tamar Alkon-Meadows, MD, Deborah Cassis-Bendeck, MD, Martha Luna-Rojas, MD, Alan B Copperman, MD and Benjamin Sandler, MD

1. Reproductive Medicine Associates of New York, New York, NY

OBJECTIVE:
It has been shown that cleavage stage morphokinetic apperance correlates with embryonic ploidy, competence and implantation potential[1]. Commonly, an embryo from the same patient can show differences in grade assessment at varying points of development. For instance, a cleavage staged embryo could receive a poor quality grade, but after blastulation, could be receive a high quality grade, undergo PGT-A, and become selected for embryo transfer. Our study objective is to analyze IVF outcomes of embryos with initially suboptimal morphokinetic characteristics at cleavage stage that later developed into high quality expanded blastocysts and were selected for transfer in single, euploid frozen embryo transfers (FET)

MATERIALS AND METHODS:
All FET cycles from 2016-2021 were analyzed. PGT-A with *NGS* was performed for all cases. Cohorts were segregated into three groups based on Day 3 embryo morphologic grade. Embryo grading was rated based on the Istanbul Consensus scoring system[2]. Only embryos that continued development to blastocyst stage and underwent PGT-A were included. Patient demographics and cycle outcomes after a single euploid blastocyst embryo transfer were recorded. Comparative statistics, ANOVA and an adjusted mixed model with a GEE were utilized for analyses

RESULTS:
8,041 single, euploid FETs were analyzed. 7,763 Good, 235 Fair and 43 Poor graded Day 3 embryos were analyzed. A difference was found in number of blastomeres ($p < 0.0001$), % of fragmentation ($p < 0.0001$) and multinucleated blastomeres ($p < 0.0001$) on Day 3 among cohorts. Also, the percentages of top quality blastocysts that were transferred ($p < 0.0001$) and endometrial thickness at FET ($p = 0.01$) were significantly different among cohorts. No differences were found in patient's age, BMI, AMH, and other demographic variables between cohorts
Significant differences were found in implantation ($p = 0.007$), clinical pregnancy ($p=0.0006$) and ongoing pregnancy rates ($p=0.02$), yet, no differences were found in Clinical Pregnancy Loss (CPL) rates among cohorts. After adjusting for age, BMI, AMH, blastocyst quality, day of biopsy and endometrial thickness, no association was found between Day 3 grading and increased odds of CPL (OR 3.67 CI95% 0.21-63.6); lower implantation (OR 1.65; 0.72-3.80); clinical pregnancy (OR 1.51; 0.70-3.20); and ongoing pregnancy rates (OR= 1.19; 0.54-2.61). On a sub analysis there was no association with lower implantation rates and the number of blastomeres (OR= 1.03; 0.97-1.03); multinucleated blastomeres (OR= 0.7; 0.37-1.51) and % of fragmentation (OR= 0.9; 0.97-1.007) during cleavage stage

CONCLUSIONS:

The morphokinetic appearance of an embryo during cleavage stage predicts blastulation, but not necessarily full reproductive potential. Our analysis demonstrated that embryos can receive a suboptimal quality grade on day 3 and still successfully blastulate and achieve a live birth after a FET

IMPACT STATEMENT:

Our study demonstrated that an embryo with a suboptimal quality assessment on day 3 of development can safely reach blastulation, become selected for transfer, and achieve a successful pregnancy outcome

REFERENCES:

- Zaninovic N, et al. Assessment of embryo morphology and developmental dynamics by time-lapse microscopy: is there a relation to implantation and ploidy? Fertil Steril. 2017 Nov;108(5):722-729.
- The Istanbul consensus workshop on embryo assessment: proceedings of an expert meeting. Hum Reprod. 2011 Jun;26(6):1270-83.