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INNER CELL MASS AND TROPHOCTODERM MORPHOLOGY IMPACT THE LIKELIHOOD OF ACHIEVING SUSTAINED IMPLANTATION AMONG EXPANDED, EUPLOID BLASTOCYSTS.

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OBJECTIVE: Preimplantation for genetic testing for aneuploidy (PGT-A) has been prospectively demonstrated to increase implantation rates over morphologic assessment alone. However, it is unclear whether morphology retains additional predictive power once an embryo is diagnosed as euploid with PGT-A. We sought to evaluate the influence of morphologic assessment by comparing pregnancy outcomes among expanded, euploid blastocysts (blasts).

DESIGN: Retrospective cohort.

MATERIALS AND METHODS: All autologous IVF cycles between 2012-2016 were reviewed for inclusion. Only transfer of expanded blasts were performed during this time period (at least Grade 4 by Gardner criteria) and only single embryo transfers were included. The subjects were separated into 3 groups (good, fair, poor) based on the morphology of the inner cell mass (ICM) and trophoctoderm (TE). Good quality blasts were defined as having any combination of A or B grades for both ICM and TE. Fair quality blasts were those with only 1 C grade assigned to either ICM or TE grade. Blasts with C grades in both ICM and TE were categorized as poor. The primary outcome was sustained implantation rate (SIR), defined as presence of fetal cardiac activity at 8 weeks. Logistic regression was performed to control for female age, size of the blast cohort, and day of transfer (5 or 6). Secondary outcome included pregnancy loss rate following a positive serum beta human chorionic gonadotropin (bHCG).

RESULTS: A total of 2949 transfers were included. Blasts graded as good, fair, and poor quality demonstrated SIR of 70.5%, 56.9%, and 47.5%, respectively. Compared to the good quality cohort, and after controlling for age, cohort size, and day of transfer, the adjusted odds of sustained implantation were significantly reduced for the fair (aOR 0.56, 95% CI 0.44-0.71, $p < 0.001$) and the poor-quality group (aOR 0.35, 95% 0.22-0.55) ($p < 0.001$). Pregnancy loss rate was significantly lower among good quality blasts ($p < 0.001$).

CONCLUSIONS: Even among fully expanded, euploid blasts, ICM and TE morphology influence the likelihood of achieving a sustained implantation. The letter C grade in either or both ICM and TE is also associated with an increased risk of miscarriage. These data indicate that morphologic assessments should be considered when counseling patients on anticipated success - even among euploid blasts. This information may be particularly useful to patients who are planning to bank multiple euploid embryos to achieve their desired family size. e212

ASRM Abstracts Vol. 110, No. 4, Supplement, September 2018 References: 1. Irani, M., Reichman, D., Robles, A., Melnick, A., Davis, O., Zaninovic, N., ... & Rosenwaks, Z. (2017). Morphologic grading of euploid blastocysts influences implantation and ongoing pregnancy rates. *Fertility and sterility*, 107(3), 664-670. 2. Heitmann, R. J., Hill, M. J., Richter, K. S., DeCherney, A. H., & Widra, E. A. (2013). The simplified SART embryo scoring system is highly correlated to implantation and live birth in single blastocyst transfers. *Journal of assisted reproduction and genetics*, 30(4), 563-567.