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CLINICAL AND EMBRYOLOGICAL FACTORS ASSOCIATED WITH A HIGH PROPORTION OFMOSAIC EMBRYOS: CAN WE IDENTIFY ANYONE AT RISK?

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OBJECTIVE:

Mosaicism is defined as the presence of more than one cell line in a single embryo and is inferred on preimplantation genetic testing for aneuploidy (PGT-A) by an intermediate copy number on next generation sequencing (NGS). The estimated rate of reported mosaicism is between 3-20%. However, there are selected patients who experience higher proportions of mosaic embryos than expected compared to the general patient population who undergoes in vitro fertilization (IVF)with PGT-A. The objective of this study was to investigate whether there are risk factors associated with patients who have an increased proportion of embryos reported to be mosaic in a single IVF with PGT-A cycle.

MATERIALS AND METHODS:

This study included all patients undergoing IVF with intracytoplasmic sperm injection (ICSI) and PGT-A at a single academic center from January 2020-March 2022. All PGT-A testing was performed using next generation sequencing (NGS) that reported for mosaicism. Our primary outcome was mosaicism rate. Cycles were categorized by the percentage of embryos diagnosed on PGT-A as mosaic (as ≤ 20% or >20%) and demographic and cycle characteristics were collected. Comparative statistics were performed with t-test, Kruskal-Wallis, and chi-square. The groups were analyzed using a multivariate regression analysis.

RESULTS:

A total of 3,848 IVF cycles were included in our analysis. 17,505 embryos were biopsied with a 10.4% average rate of mosaicism. Baseline characteristics were obtained and examined including: primary diagnosis, oocyte age, partner age, semen analysis parameters, body mass index(BMI), anti mullerian hormone (AMH), basal antral follicle count, Day 3 follicle stimulating hormone, estrogen at time of surge, cumulative and individual gonadotropin dose

(recombinant follicle stimulating hormone/menotropin/combined). After multivariate regression analysis, no patient or cycle characteristics were found to be significantly associated with increased odds of >20%mosaicism in an embryo cohort from a single cycle.

CONCLUSIONS:

This study was unable to identify any patient or cycle characteristics that are associated with having a high proportion of mosaic embryos from IVF with PGT-A. Although we have previously reported that older oocytes are more likely to result in individual embryos being classified as aneuploid rather than mosaic, our findings are in agreement with the literature that states there are no known risk factors that are correlated with IVF cycles that have a high percentage of embryos classified as mosaic. Further research into the mechanism behind post-fertilization mitotic errors and predisposing risk factors is needed.

IMPACT STATEMENT:

Patients can be assured that there is no individual and/or cycle-specific characteristic found to be associated with experiencing >20% embryos diagnosed as mosaic in a single IVF with PGT-A cycle.

REFERENCES:

N/A