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EFFECT OF RACE ON EUPLOIDY STATUS AND LIVE BIRTH RATES IN ART TREATMENTS

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OBJECTIVE:

Racial disparities in outcome have been reported in fertility care, and in particular, in Assisted Reproductive Technology (ART) treatment. Existing studies have been limited by sample size and have relied upon outcomes from fresh IVF. To our knowledge, no study has evaluated the impact of race and ethnicity with regard embryo ploidy status and subsequent euploid embryo transfer outcomes. The aim of this study is to analyze the euploidy status of embryos using preimplantation genetic testing for aneuploidy (PGT-A) and live birth (LB) outcomes following single, euploid embryo transfer (SEET) among various racial groups.

MATERIALS AND METHODS:

The study included all ovarian stimulation cycles in a single academic institution in which PGT-A was performed using Next Generation Sequencing from January 2016 to February 2021. Our primary outcome was embryo euploidy status; the secondary outcome was LB. Baseline demographics were obtained: age, body mass index (BMI), antimüllerian hormone (AMH), basal antral follicle count, basal follicle stimulating hormone, peak serum estradiol, endometrial thickness at transfer, and self-reported race. ANOVA, Kruskal-Wallis, chi-square, and multivariate logistic regression were used for analysis.

RESULTS:

A total of 6122 patients underwent an IVF cycle with ICSI & PGT-A: Of these, 3628 self-reported as white (59%), 336 as black (5%), 1122 as Asian (18%), 534 as Hispanic (8%), 150 other (2%), and 352 (6%) did not specify their ethnicity. Black women were significantly older (38.0 ± 3.1 yrs, $p=0.0006$), and Black and Hispanic women had significantly higher BMI (27.9 and 26.6 kg/m², respectively, $p=0.001$) compared to the other cohorts. All other cycle characteristics were comparable among groups. When analyzing embryo ploidy status, white women had higher number of euploid embryos/euploidy rate ($3.4 \pm 1.9/49.7 \pm 35.3\%$, $p<.02$) compared to the other groups. After adjusting for age, BMI and AMH, white women were more likely to have euploid embryos (aOR 1.13, CI 1.06-1.20, $p= 0.0001$) when compared to other races. SEET was performed for 4524 women. No statistical significance was observed in LB rates between white women and other races after adjusting for confounders (aOR 1.19, CI 95% 0.2-6.4, $p=0.8$).

CONCLUSIONS:

The higher rate of aneuploidy in non-white races may explain, in part, the poorer outcomes reported in prior studies of untested embryos in fresh embryo transfers. These results suggest differences in basic mechanisms governing meiosis and/or its repair mechanisms by self-reported race. However, LB outcomes following a SEET do not appear to differ among women of different races. This data may help reassure non-white patients that once a euploid embryo is transferred, the odds for a live birth is not affected by race.

IMPACT STATEMENT:



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These data indicate that race remains a persistent independent stratifying factor of ART outcomes, particularly, affecting the odds of achieving a euploid embryo.