RISK FACTORS FOR EMBRYO ANUEPLOIDY IN YOUNG PATIENTS

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Background:
Embryo aneuploidy is a significant cause of early pregnancy loss and *in-vitro* fertilization (IVF) failure (1). As preimplantation genetic testing for aneuploidy (PGT-A) of embryos has become an increasingly utilized resource, the likelihood of obtaining euploid blastocysts has become a focus of counseling between providers and patients. It is well understood that the risk of creating aneuploidy embryos increases with increasing maternal age (2). However, it is unknown whether there are risk factors apart from age associated with higher rates of embryo aneuploidy in younger patients.

Objective:
Our goal was to determine if prior infertility diagnosis, treatment-specific parameters, or other medical comorbidities may predispose young patients to the creation of aneuploidy embryos.

Materials and Methods:
This was a retrospective cohort study of all patients 18-37 years old who underwent an IVF stimulation cycle, cryopreservation of embryos with PGT-A, and subsequent frozen embryo transfer between January 2020 and December 2021 at a tertiary care center. Demographic information was summarized using descriptive statistics. Risks of creating aneuploidy embryos were estimated using Pearson's chi-squared analyses and multivariable logistic regression.

Results:
Approximately 215 subjects and 248 assisted reproductive technology cycles were included. The average age of participants was 33.9 (SD = 2.5). Most participants identified as White (82.0%), followed by Asian (7.9%), Black (2.8%), Pacific Islander (1.4%), and Hispanic (0.5%). Age was associated with increasing odds of aneuploidy (OR = 1.2, 95% Confidence interval 1.0-1.3). Prior infertility diagnoses including fibroids, polyps, diminished ovarian reserve, tubal factor, endometriosis, ovulatory dysfunction, unexplained infertility, recurrent pregnancy loss, chromosomal translocation, and male factor infertility were not associated with aneuploidy risk. Treatment-specific parameters including sperm source, anti-Mullerian hormone level, follicle stimulating hormone level, peak estradiol level, the use of intracytoplasmic sperm injection, and the number of blasts produced in a cycle also did not correlate with higher aneuploidy rates. A greater total number of oocytes retrieved was associated with risk of aneuploidy in the univariable analysis, though this association was lost on multivariable analysis. Personal histories of obesity, cardiovascular, autoimmune, neurological, gastrointestinal, hematologic, endocrine, renal, psychiatric, alcohol use, tobacco use, or substance use disorders were also not associated with aneuploidy risk.

Conclusion:

Our study demonstrates that embryo aneuploidy was associated with increasing age but not prior infertility diagnosis, treatment-specific parameters, or other medical comorbidities, which may have important implications for counseling of young patients considering PGT-A and healthcare resource utilization.

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References:

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