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SHOULD PATIENTS WITH ONLY TWO EMBRYOS ELIGBILE FOR BIOPSY AFTER A SINGLE CONTROLLED OVARIAN HYPERSTIMULATION CYCLE UTILIZE PGT-A PRIOR TO TRANSFER SELECTION?

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OBJECTIVE:
Preimplantation genetic testing for aneuploidy (PGT-A) is often utilized to enhance implantation rates by enabling the selection of a euploid embryo for transfer. Clinicians may question whether the use of PGT-A is beneficial, especially for patients who produce low numbers of embryos after controlled ovarian hyperstimulation (COH).[1] Our study aims to assess the potential benefit and/or risk of utilizing PGT-A prior to embryo transfer in patients with only two available embryos compared to fresh or frozen ET cycles without PGT-A.

MATERIALS AND METHODS:
This study included patients who underwent an IVF cycle and had only two viable embryos available after COH from January 2003 to March 2021. Patients were separated into three groups: Group A: Patients who underwent subsequent single euploid blastocyst FET; Group B: Patients who underwent subsequent single blastocyst FET without the use of PGT-A; Group C: Patients who underwent fresh double embryo transfer (DET) on day 3 or 5. Patients who utilized PGT-A were included in the study if they had at least one euploid embryo available for transfer. Basic demographic and cycle characteristics were compared between groups. Statistical analysis was performed using ANOVA, chi-square, and logistic regression.

RESULTS:
Of the 949 patients included in this study, 772 underwent a single euploid blastocyst FET, 123 underwent a single FET w/o the use of PGT-A, and 54 underwent a fresh DET, . All patients attempted at least one embryo transfer cycle, and 102 patients underwent two embryo transfer cycles. Patients who underwent FET with PGT-A were more likely to become pregnant, and more likely to become pregnant after their first embryo transfer when compared with both FET without PGT-A patients and Fresh DET ($p < 0.0001$). Negative pregnancy outcomes as defined by a transfer resulting in a biochemical pregnancy, clinical pregnancy loss, or ectopic pregnancy were similar amongst all groups for both the first and second embryo transfer.
On multivariate logistic regression, after adjusting for age, BMI, endometrial thickness, and embryo quality, there was a lower odds of pregnancy when undergoing single blastocyst FET without PGT-A compared to single blastocyst FET with PGT-A (OR 0.334 95% CI 0.139-0.805). There was no difference in negative pregnancy outcomes between the groups.

CONCLUSIONS:
A decision must be made for patients with only two embryos available after COH whether to undergo fresh ET (with one or two embryos) or to cryopreserve the embryos with or without the use of PGT-A. This study uses big data to develop a decision-support tool to aid physicians in making this decision. Our study demonstrates that in patients who develop only two viable embryos, use of PGT-

A enhances the likelihood of achieving a successful pregnancy compared to patients who underwent a day 3 or 5 fresh DET or single blastocyst FET with untested embryos.

IMPACT STATEMENT:
In patients with a low number of embryos per cycle, utilization of PGT-A leads to higher odds of pregnancy and should be considered over transfer of unscreened embryos.

REFERENCES:
1. Lukassen HGM. Two cycles with single embryo transfer versus one cycle with double embryo transfer: a randomized controlled trial. Human reproduction. 2005;20(3):702-708. doi:10.1093/humrep/deh672