

SUCCESS PREDICTS SUCCESS: OBTAINING A EUPLOID EMBRYO IN FIRST IVF CYCLE DEMONSTRATES INCREASED CHANCES FOR SUBSEQUENT CYCLES

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Background: Multiple IVF cycles are often required to achieve one live birth (1). According to the SART Preliminary National Summary Report for 2022, only 43.1% of women less than 35 years old have a live birth from their first egg retrieval (2). Preimplantation genetic testing for aneuploidy (PGT-A) can be used to guide whether patients should complete additional IVF cycles, as patients are often counseled to acquire two euploid blastocysts for one live birth. A recent study found that patients who had all aneuploid embryos in the first IVF cycle had comparable chance of euploid embryos and live birth rates to national age-based standards in their second cycle (3). On the other hand, does obtaining a euploid embryo from one cycle predict the same result in a subsequent cycle?

Objective: To determine if obtaining a euploid embryo in the first IVF cycle is associated with an increased chance of having additional euploid embryos in subsequent cycles.

Materials and Methods: This was a retrospective cohort study of embryo biopsies for PGT-A analyzed by Progenesis from 1/1/2019 to 9/1/2024. Donor egg cycles were excluded as well as patients with less than two autologous IVF cycles. A multilevel logistic regression model was conducted to analyze the likelihood of having a euploid embryo in a subsequent cycle after obtaining a euploid embryo in the first cycle. Odds ratios (OR) with 95% confidence intervals (CI) were reported to quantify this association. We repeated our analysis after categorizing the patients by their SART-defined age groups: <35, 35-37, 38-40, 41-42, and >42 years old.

Results: There were 2,037 patients who underwent two or more autologous IVF cycles with PGT-A. These patients completed 6,548 cycles and 19,001 embryos underwent PGT-A testing. The median number of cycles per patient was 3 (± 1.30), and the mean ratio of euploid to non-euploid embryos per cycle was 0.388 (± 0.379). 4,027 (62%) cycles had at least one euploid embryo. The odds ratio (OR) of having another euploid embryo in a subsequent IVF cycle for patients who had a euploid embryo in the first cycle was 7.75 (6.79-8.84, $p < 0.0001$). Age was a significant effect modifier, so the analysis was repeated accounting for SART age group (Table 1).

Table 1: Likelihood of a euploid embryo in subsequent IVF cycles after obtaining a euploid embryo in the first cycle by SART age groups

Age	Patients	Cycles	OR	p-value
<35	435	1,176	9.81 (6.86, 14.0)	<0.0001
35-37	602	1,529	5.10 (3.92, 6.57)	<0.0001
38-40	775	1,986	5.61 (4.61, 6.83)	<0.0001
41-42	498	1,192	3.40 (2.66, 4.34)	<0.0001
>42	271	665	3.80 (2.61, 5.55)	<0.0001

Conclusions: Obtaining a euploid embryo in the first cycle was predictive of having another euploid embryo in a subsequent cycle. While this was significant for all comers and each SART age group, association was strongest for younger patients. However, even in the >42-year-old age group, obtaining one euploid embryo in the first cycle demonstrated a statistically significantly increased likelihood of obtaining additional euploid embryos. Therefore, even patients in older age groups may be encouraged to undergo subsequent IVF cycles after obtaining a euploid embryo in the first cycle if additional euploid embryos are needed to reach their family goals.

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References:

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