

THE ASSOCIATION BETWEEN EMBRYO SEX AND PREGNANCY OUTCOMES IN EUPLOID EMBRYOS

Sharon Zhao BA ¹, Yuqi Bian BA ¹, Maxwell Edwin Shramuk MS ², Jacob Schauer PhD ², Joan Riley PhD ³, Allison Komorowski MD ³, Lia Bernardi MD ³

¹ Northwestern University Feinberg School of Medicine, Chicago, IL; ² Biostatistics Collaboration Center, Northwestern University, Chicago, IL; ³ Division of Reproductive Endocrinology and Infertility, Northwestern University Feinberg School of Medicine, Chicago, IL

BACKGROUND: The selection of an embryo to transfer following IVF is often based on embryo quality or sex preference. Previous studies have revealed varying sex-related differences among frozen embryos and pregnancy outcomes. The rationale for selecting an embryo to transfer and whether differences exist in pregnancy rates and outcomes between these groups remains unclear.

OBJECTIVE: To examine pregnancy outcomes by embryo sex and to assess whether there was an association between sex selection and pregnancy outcomes among patients undergoing single euploid frozen embryo transfer (FET).

MATERIALS AND METHODS: This was a retrospective cohort study of patients who underwent FET at a single academic medical center between 2020-2021. Chart review was conducted to assess patient demographics, embryo characteristics, and pregnancy outcomes. As patients were permitted to select which embryo to transfer if they had equally graded embryos of both sexes, whether a patient chose a specific sex was also determined. Chi-square tests were used to compare outcomes between female and male embryos. Mixed-effect multivariable logistic regression was performed to determine odds ratios. A p-value of <0.05 was considered statistically significant.

RESULTS: Data from 768 euploid embryo transfers (576 patients) were analyzed. At the time of FET, the mean patient age was 36.3 years, and the mean BMI was 25.9 kg/m². Following FET, 52.6% of cycles resulted in live birth (LB), 15.4% ended in a clinical or biochemical miscarriage, and 29.8% of cycles did not result in a pregnancy.

Of the FETs that resulted in LB, a significantly higher proportion of male embryos were cryopreserved on day 5 (74.3%) when compared to the proportion of female embryos cryopreserved on day 5 (63.3%) (p=0.037). The LB rate was not significantly different between day 5 male (54.6%) and day 5 female (57.8%), p=0.523. However, the LB rate was significantly lower for day 6 male embryos (35.9%) compared to day 6 female embryos (50.0%), p=0.033.

Embryo sex was known in 79.4% of transferred embryos. Amongst these, 51.0% were female and 49.0% were male. The LB rate was 54.3% for female embryos and 48.2% for male embryos. The odds of LB was not significantly different between female and male embryos (aOR 1.14, 95% CI 0.96-1.36). Miscarriage rates were similar in female (15.7%) and male (15.4%) embryos (p=0.899).

There were 161 transfers (21.0%) where embryo sex was selected, and 52.2% of sex selected embryos were male while 47.8% were female. The LB rate was 52.8% in cycles where patients selected sex and 52.6% in cycles where sex was not selected. Selecting embryo sex did not lead to a significant difference in the odds of LB (aOR=1.03, 95% CI 0.84-1.25).

CONCLUSIONS: Embryo sex and sex selection were not associated with the odds of LB in patients undergoing single euploid FET. If aiming to achieve the highest LB rate, embryo sex should not drive decision making on which embryo to transfer.