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DO EARLY BHCG DYNAMICS DIFFER BETWEEN MOSAIC AND EUPLOID TRANSFERS?

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Title:

DO EARLY BHCG DYNAMICS DIFFER BETWEEN MOSAIC AND EUPLOID TRANSFERS?

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Preferred Presentation Type:

Oral or Poster

Study Type:

Retrospective Cohort Study (includes comparator groups)

Category - Subcategory(ies):

ART: Clinical

ART: Outcomes

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References:

1. Hernandez-Nieto C, Lee J, Alkon-Meadows T, Briton-Jones C, Sandler B, Copperman A, Mukherjee T. Biological relevance of trophoctoderm morphology: initial β -hCG measurements correlate with trophoctoderm grading on euploid frozen embryo transfers. J Assist Reprod Genet. 2022 Sep;39(9):2051-2059. doi: 10.1007/s10815-022-02553-6.

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Nothing to disclose. No off-label or otherwise non-approved product use.

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Abstract Category:

All Other Categories

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Abstract Text:

OBJECTIVE:

Serum β human chorionic gonadotropin (β -hCG) threshold levels and the rate of β -hCG rise are well-established predictors of pregnancy viability in invitro fertilization cycles.¹ While prior studies on early β -hCG trends have explored variables such as embryo developmental stage, they have not specifically addressed the potential difference between the transfer of a mosaic versus euploid embryo. The aim of this study is to compare early serum β -hCG dynamics between single mosaic embryo transfer (SMET) and single euploid embryo transfer (SEET).

MATERIALS AND METHODS:

This retrospective study, conducted at a single academic center, included all patients who underwent a SMET resulting in a positive pregnancy test (serum β -hCG ≥ 2.5 mIU/mL) between 2021 and 2025. Each case was matched in a 3:1 ratio to patients who underwent a SEET with a positive pregnancy test, based on age at oocyte retrieval and embryo transfer, body mass index (BMI), embryo grade, and day of embryo biopsy. Only cases that had a first β -hCG measurement on day 9 post transfer were included in the analysis. The primary outcome was serum β -hCG levels on days 9 and 11 post transfer; secondary outcomes included the rate of β -hCG rise from day 9 to day 11 post transfer and live birth rates. Statistical analyses were conducted using Mann–Whitney U, Chi-square test, a mixed effects model and multivariate linear regression. A sample size of 56 patients in the SMET group and 168 patients in the SEET group was calculated to achieve 80% power to detect a 25% relative difference in mean serum β -hCG levels on days 9 and 11 ($\alpha=0.05$).

RESULTS:

A total of 62 patients who underwent SMET were matched with 186 patients who underwent SEET. Serum β -hCG levels were comparable between groups on both day 9 (132.9 ± 98.2 vs. 131.0 ± 100.0 mIU/mL; $p = 0.90$) and day 11 (385.2 ± 205.0 vs. 379.1 ± 212.0 mIU/mL; $p = 0.87$) post-transfer. Rise in β -hCG from day 9 to day 11 was also similar, with an increase of 252.3 mIU/mL (189.8%) in the SMET group and 248.1 mIU/mL (189.4%) in the SEET group ($p = 0.84$). Live birth rates were significantly lower in the SMET group (46.6%) compared to the SEET group (64.4%; $p = 0.01$). After adjusting for age, BMI, endometrial thickness at transfer, embryo grade, and day of embryo biopsy, no significant correlation was found between the transfer method and mean β -hCG levels on day 9 ($R^2 = 0.01$, $p = 0.95$) or day 11 ($R^2 = 0.01$, $p = 0.95$).

CONCLUSIONS:

While early β -hCG dynamics do not differ by embryo type, reproductive outcome in this study is consistent with existing literature that demonstrates reduced live birth rates in SMET compared to SEET. Despite similarities in early biochemical markers of implantation, mosaic embryos carry a lower potential for live birth.

IMPACT STATEMENT:

Mosaic single embryo transfers result in significantly lower live birth rates, despite similar early β -hCG dynamics to SEETs, emphasizing the importance of embryo chromosomal status in predicting pregnancy success.

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Biographical Sketch Jensen Reckhow is a PGY-3 Resident in Obstetrics and Gynecology at Mayo Clinic. She completed her BS in Environmental Engineering and MPH at Yale University. She conducted translational immunology research at NIH for two years prior to attending Ben Gurion University in Israel for medical school. This is her first time attending and presenting at ASRM and she is looking forward to learning from this passionate and inspiring community.

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Biographical Sketch Early success, marked by his first publication in CELL at Harvard Medical School, inspired Joseph to continue his research endeavors in reproductive endocrinology and infertility. Joseph has been with Reproductive Medicine Associates of New York since 2011. Joseph has authored over 400 peer-reviewed abstracts & manuscripts. Passionate about development, he cultivates relationship with investors & entrepreneurs to advance reproductive endocrinology & infertility care.
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Biographical Sketch Dr. Martha Luna is a board certified reproductive endocrinologist and infertility specialist . She joined RMA of New York in 2005 and is currently Medical Director of RMA International Mexico located in Mexico City. She completed her fellowship in RMA NY/ Mount Sinai School of Medicine and holds a masters degree by EVMS. Dr. Luna is a clinical professor of the Obstetrics and Gynecology residency program at the American British Cowdray (ABC) Hospital in Mexico City and serves as the Co-Chair of the REI Fellowship Program in Hospital Angeles del Pedregal in Mexico City. She is President of the Mexican Society for Reproductive Medicine (AMMR). Belongs to the Global Associate Panel of Fertility and Sterility.

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Progyny	Company Officer Relationship Began - Friday, August 25, 2017 Relationship Ended - Thursday, June 1, 2023 Paid Consultant Relationship Began - Relationship Ended - Direct Stockholder Relationship Began - Friday, August 25, 2017 Relationship Ended - Friday, November 1, 2024	Self

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