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PREDICTORS OF IVF CYCLES THAT DO NOT PRODUCE BLASTOCYST EMBRYOS

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Title:
PREDICTORS OF IVF CYCLES THAT DO NOT PRODUCE BLASTOCYST EMBRYOS

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Preferred Presentation Type:
Oral or Poster

Study Type:
Retrospective Cohort Study (includes comparator groups)

Category - Subcategory(ies)s:
Infertility: Outcomes

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Abstract Category:
All Other Categories

Applied for the In-Training Award for Research

Abstract Text:
OBJECTIVE: Assisted reproductive technology (ART) treatment is the most effective option for family-building for patients facing subfertility and infertility. However, unsuccessful ART cycles

impose financial, physical, and emotional burden on patients. This study aims to identify patient-specific factors associated with the absence of embryos created after ART, to identify patients who may benefit from an alternative treatment approach.

MATERIALS AND METHODS: This retrospective cohort study evaluated autologous in vitro fertilization (IVF) cycles with ≥1 oocyte retrieved between 1/2004 and 12/2024. Cycles were grouped by whether they produced blastocyst embryos, including those suitable for transfer, biopsy for preimplantation genetic testing, or cryopreservation. The primary outcome was creation of such a blastocyst embryo. Secondary outcomes included number of oocytes retrieved and rates of fertilization, blastulation, biopsy, and euploidy. Patient demographics and cycle characteristics were compared using chi square analyses, Student t test, and Kruskal-Wallis tests. Receiver operating characteristic (ROC) curves with Youden indices identified threshold values of predictive parameters for the primary outcome.

RESULTS: In total, 22,452 IVF cycles were included: 18,167 (80.9%) with suitable embryos and 4,285 (19.1%) without. Compared to those who produced blastocysts, patients whose cycles did not yield blastocysts were older (mean oocyte age 40.0±3.8 years vs 37.4±4.3 years, p<0.0001), had a lower median anti-Mullerian hormone (AMH, ng/mL) level (0.82, IQR 0.42-1.55 vs 1.66, IQR 0.84-3.12, p<0.0001) and required higher cumulative gonadotropin doses (median 4575IU vs 4125IU, p<0.0001). No cycle with oocytes aged >48.6 yielded any blastocysts suitable for transfer or biopsy, and no euploid blastocysts were obtained with oocytes aged >45.8. The lowest antral follicle count (AFC) for a cycle that produced any blastocysts was 2, which was also the minimum AFC which yielded any euploid embryos. The highest basal follicle-stimulating hormone (FSH, IU/L) in cycles that yielded ≥1 euploid embryo was 28.5. No euploid embryos were obtained from any patient >45 years old with an AFC <3, nor from patients >43 years old with a basal FSH >10. Among patients with undetectable AMH (<0.02), no blastocysts suitable for transfer or biopsy were obtained in patients over age of 27. Nearly 80% (79.8%, N=148) of cycles in patients ≥35 years with basal FSH >10 and AMH <0.1 were unsuccessful in obtaining a blastocyst suitable for biopsy or transfer.

CONCLUSIONS: Increasing oocyte age, particularly >45, significantly reduces the likelihood of developing blastocysts suitable for transfer, biopsy or cryopreservation. When considered alongside oocyte age, AMH, AFC, and FSH offer valuable prognostic insight into the probability of obtaining transferable or testable embryos in ART cycles.

IMPACT STATEMENT: Oocyte age, in combination with ovarian reserve assessment (AMH, AFC, FSH), can help identify patients at high risk of cycle failure due to absence of transferable or testable blastocysts, offering a data-driven framework for more personalized and realistic fertility counseling.

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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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