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RAPID THAWING IS ASSOCIATED WITH IMPROVED EMBRYO SURVIVAL AND PREGNANCY OUTCOMES IN EUPLOID FROZEN EMBRYO TRANSFERS

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Title:
RAPID THAWING IS ASSOCIATED WITH IMPROVED EMBRYO SURVIVAL AND PREGNANCY OUTCOMES IN EUPLOID FROZEN EMBRYO TRANSFERS

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Oral or Poster

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Case Control Study

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ART: Clinical
ART: Laboratory
ART: Outcomes

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Applying for an award

Trainee: No

Abstract Category:
All Other Categories

Abstract Text:

OBJECTIVE:

Post-vitrification, standard thawing (ST) follows a three-step washing protocol—thawing, dilution, and washing solutions—over 7-10 minutes. However, a newer rapid thawing (RT) protocol only warms embryos in thawing solution for 1 minute before placing into equilibrated culture media prior to transfer. Support for RT is based on the premise that earlier exposure to culture media at 37°C post-thaw provides early exposure to essential nutrients that help the embryo resume critical biological processes. Due to small samples sizes, limited research has been able to corroborate whether RT yields comparable embryo thaw survival and pregnancy rates to ST. This study evaluates whether RT is an efficient protocol for embryo re-warming, preserving embryo quality, and supporting pregnancy rates in euploid frozen embryo transfers (FET).

MATERIALS AND METHODS:

The retrospective study, conducted at an academic infertility clinic, include patients who planned euploid FETs from 2016 to 2025. Cases were allocated based on the thawing protocol: ST or RT. Primary outcomes was thaw-survival rate. Secondary outcomes included pregnancy outcomes after euploid FET. Dispersion, univariate and an adjusted multivariate GEE analyses were performed. A sample size of 769 cases per group was calculated to achieve 80% power to detect a 3% difference in survival rates (α=0.05).

RESULTS:

A total of 15,523 FETs were included, with 1,322 in the RT cohort and 14,201 in the ST cohort. In the univariate analysis, euploid embryos warmed using the RT protocol demonstrated higher post-thaw survival rates (99.2% vs 98.2%, p=0.005) clinical pregnancy rates (66.5% vs 63.0%, p=0.01) and live birth rates (59.9% vs 53.3%, p=<0.001) compared to those thawed with the ST protocol. Also, the RT cohort was associated with lowered biochemical pregnancy loss (13.0% vs 15.9%, p=0.02), clinical pregnancy loss (8.7% vs 13.0%, p=0.0002), and multiple pregnancy (0.0% vs 1.2%, p=0.0006).

In an adjusted multivariate analysis adjusting for age, BMI, AMH, year of treatment, embryo quality, and type of cryopreservation protocol; RT was significantly associated with lower odds of embryo non-survival after thaw compared to ST (aOR=0.21, CI95% 0.5-0.83), and RT was not associated with increased odds of embryo score downgrading after re-warming.

RT was significantly associated with higher implantation rates (OR=0.81, CI95% 0.68-0.97) and lower clinical pregnancy loss rates (aOR=0.72, CI95% 0.53-0.99) compared to ST. All other pregnancy outcomes were comparable among groups.

CONCLUSIONS:

RT demonstrated higher embryo survival, improved implantation and live birth rates, and reduced pregnancy loss. These findings suggest that RT enhances workflow efficiency while maintaining or improving clinical outcomes in euploid frozen embryo transfers.

IMPACT STATEMENT:

Embryos re-warmed using the rapid thaw protocol demonstrate improved clinical thaw-survival and pregnancy outcomes compared to those thawed using standard protocols.

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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 Richard Slifkin, MS, TS(ABB), CLT(NYS) serves as the Associate Laboratory Director at Reproductive Medicine Associates of New York. Rick is a frequent presenter and has led the development and dissemination of best practices for embryology laboratory efficiencies and how to employ emerging technologies to lower staff burnout while improving pregnancy rates and integrity of specimen identity.
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Biographical Sketch Christine Briton-Jones, PhD HCLD serves as the Director of Laboratory Services at Reproductive Medicine Associates of New York (RMA of New York) and as a faculty member of the Reproductive Endocrinology and Infertility (REI) fellowship of Mt. Sinai School of Medicine. Prior to joining RMA in 2015, Dr. Briton-Jones trained in Australia and worked in combined research and clinical positions in Australia, Hong Kong, and directorial positions in California, Utah, Idaho and Nevada. Dr. Briton-Jones has over 20 years of experience in clinical embryology and has participated in developing and refining the laboratory techniques that have contributed to the growing success of assisted reproductive technologies with over 150 peer reviewed scientific manuscripts and abstracts published in international journals. While in Hong Kong, Dr. Briton-Jones secured over $1 million in grants to fund research projects and developed Y-chromosome microdeletion screening services through the Hospital Authority of Hong Kong. While in California, she was the research director for ART Reproductive Center in Beverly Hills, the embryology service for UCLA and Cedars Sinai Medical Center. Dr. Briton-Jones is a frequent presenter at the American Society for Reproductive Medicine's annual conference as well as the Pacific Coast Reproductive Society annual meeting, and was an invited speaker at fertility conferences in the United States, Scotland, England, Canada, Australia, Guadalajara, Mexico; mainland China and Hong Kong. She was an Associate Editor of Reproductive Biology and Endocrinology Journal (RBEJ) from 2005 to 2016 and is an ad hoc reviewer for Fertility and Sterility; Journal of Reproductive Biology and Endocrinology, Reproductive Biology and Endocrinology Journal Online, Journal of Assisted Reproduction and Genetics, Theriogenology Journal, and the Human Reproduction and Molecular Human Reproduction Journals.
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