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P-247  Fresh oocyte donation, the use of donor sperm, and the number of usable blastocysts are associated with higher clinical pregnancy rates: results from 1655 cycles


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Study question: What are the factors associated with clinical pregnancy in the first single embryo transfer of an oocyte donation treatment?

Summary answer: The number of blastocysts and the use of donor sperm were positively correlated with clinical pregnancy, while the use of vitrified/warmed oocytes was negatively correlated.

What is known already: The use of donor oocytes for in vitro fertilization treatments is often necessary to overcome infertility. The number of donor oocytes allocated to each recipient is a key variable to the cumulative success of these treatments. However, time to pregnancy is another key metric in assisted reproduction, and it is important to achieve a better understanding of the factors influencing the success of the first embryo transfer of an oocyte donation treatment.

Study design, size, duration: A retrospective study was conducted to analyze the outcome of the first single blastocyst transfer of 1665 oocyte donation cycles, from 8 private IVF units, from July 2018 to July 2021. Patients who underwent multiple cycles were only included in the study once, during their first treatment. The endpoint of the study was the clinical pregnancy rate, defined by the presence of a gestational sac confirmed by ultrasound one month after the transfer.

Participants/materials, setting, methods: All cycles during the study period, using donor oocytes, resulting in a first fresh or frozen single blastocyst transfer were analyzed. Cases that used PGT-A or sperm from testicular biopsy were excluded. Multiple logistic regression was used to determine the association of the variables: patient age, sperm origin, vitrified/warmed oocytes, fertilization and blastocyst development rate, total number of usable blastocysts obtained, fresh/frozen transfer, and embryonic day at transfer.

Main results and the role of chance: A total of 972 (58.4%) embryo transfers resulted in a clinical pregnancy in the study population. The mean age of the recipient and male partner was 42.1±4.4 years and 42.1±6.0 years, respectively, and did not differ between positive and negative transfer groups. Statistically significant higher pregnancy rates were observed for day 5 transfers vs. day 6 (59% vs 46%) and fresh vs. vitrified/thawed oocytes (64% vs. 55%). The mean number of zygotes (5.1 vs. 4.8, p = 0.032), the mean fertilization rate (76.3% vs. 72.8%, p = 0.007), the mean usable blastocyst development rate (60.0% vs. 57.7%, p = 0.006) and the mean total number of usable blastocysts (2.9 vs. 2.6, p < 0.001) were higher in clinical pregnancy group.

The results of multiple logistic regression showed that the use of sperm donor increased the chances of achieving a clinical pregnancy rate in the first embryo transfer (OR 1.36, 1.04-1.79), and the use of vitrified/thawed oocytes reduced them (OR 0.69, 0.56-0.85). There was a positive association with a higher number of usable blastocysts obtained in a cycle, and higher pregnancy rates (OR 1.16, 1.07-1.26), presumably by allowing for additional morphological embryo selection.
participants/materials, setting, methods: To create hydrogels, we employed a decellularization protocol based on SDS detergent. After characterization, the tissue-specific ECM hydrogels were used for culture and control conditions (Francé-Herrero et al. 2021). With a total of 284 embryos transferred, the implantation and live birth rates were slightly lower (75.64 and 48.06%, respectively) in the experimental group compared to the control group. Although this difference was not significant at birth (75.15 ± 10.81 g vs 942.43 ± 154.92 g at week 5, 2513.98 ± 428.72 g at week 10), it was significant at week 12 (168.52 ± 6.44 g vs 3475.56 ± 270.35 g, §P < 0.05 statistically significant). After delivery, the rabbits were weighed during lactation in vivo.

Study design, size, duration: Rabbit oviducts (n = 6) were derived from decellularized (DC) fallopian tubes and cultured under optimal conditions mimicking the native environment. Nonspecific and biological signals from the native source tissue were provided by a derived culture complements, these changes can be ameliorated. The tissue-specific ECM hydrogels from DC rabbit fallopian tubes have phenotypic consequences when used for embryo culture. The interaction between humans and Artificial Intelligence (AI) augmented intelligence, (AuI) is dependent on the AI's ability to provide “black-box” advice that might cause difficult interaction with their human counterpart.

Wider implications of the findings: Factors of an oocyte donation treatment influencing the outcome of the first embryo transfer were identified. A better understanding of these factors, and interactions amongst them, is key to maximize the efficacy of these treatments, and achieve an optimal use of a limited resource such as donated oocytes.

Trial registration number: not applicable

Limitations, reasons for caution: Certain confounding factors were not accounted for: variability of results between the different IVF units, endometrial preparation protocols, post-warming embryo morphology, sperm analysis diagnostic, as well as variability in recipients’ and donors’ baseline characteristics.

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