P-781 Birthweight is not affected by freezing process. Results from a quasi-experimental study using the Oocyte Donation Model

N. Díaz[1], J. Llácer[2], E. Álvarez[3], E. Serrano[3], J. Ortiz[4], A. Bernabeu[2], J. Ten[1], R. Bernabeu[2]

[1]Instituto Bernabeu, Reproductive Embriology, Alicante, Spain ;
[2]Instituto Bernabeu, Reproductive Medicine, Alicante, Spain ;
[3]Instituto Bernabeu, Reproductive Embriology, Mallorca, Spain ;
[4]Instituto Bernabeu, Molecular Biology, Alicante, Spain

Study question: Is the freezing process responsible to increase the birthweight or the incidence of Large for Gestational Age (LGA) in Frozen Embryo Transfers (FET)?

Summary answer: Neither the birthweight nor the LGA incidence were different in embryos that underwent the freezing-thawing process.

What is known already: Freezing-thawing constitutes one of the processes with a potential impact on the health of the newborn. Data coming from register-based studies and metaanalisis have found an increase in birthweight with a higher incidence of LGA in newborns coming from FET. This is a matter of concern since epigenetic alterations have been suggested to explain this finding casting doubts on future health during childhood and adulthood. Clarifying the safety of cryotechniques should be a priority taken into account that at present frozen embryo transfers outnumber fresh embryo transfers in IVF clinics.

Study design, size, duration: This retrospective cohort study evaluated 670 women oocyte recipients who underwent fresh (367 cycles) or frozen embryo transfer (303 cycles) at Instituto Bernabeu between July 2017 and March 2019. All recipients were prepared with substitutive cycle and received single blastocyst embryo transfers on day five. All of them at the same culture medium, resulting in a singleton live birth.

Participants/materials, setting, methods: 1637 patients were assessed for eligibility but 967 were excluded. The sample size has been calculated accepting an alpha risk of 5% and a beta risk of 20%. A sample size of 266 patients (133 per group) is required to detect a minimum mean difference of 275 grams with a standard deviation of 800 grams. Pearson´s Chi-square test (univariate) and binary logistic regression (multivariate for confounding factors) were used to analyze association between variables.

Main results and the role of chance: Maternal age (42.21 ± 4.45; 42.79 ± 3.83 p=0.519), BMI (23.34 ± 3.69; 24.99 ± 15.52; p=0.060), maternal parity (Nulliparous 81.5%; 85.5%; Multiparous 18.5%; 14.5% p= 0.177), gestational diabetes (4.9%; 4.3% p=0.854), preeclampsia (2.7%; 5.6% p=0.074), hypertensive disorders (3.3%; 2.3% p=0.494), maternal smoking (10.8%; 13.0% p=0.475), gestational age (38.96 ± 1.97; 38.77 ± 2.15; p=0.207) and liveborn gender (Female 44.5%; 48.8%; Male 55.5%; 51.2%p=0.276) do not present statistically significant differences between fresh or frozen groups, respectively.

However endometrial thickness was statistically signiticantly different in both groups (8.83mm ± 1.73 fresh; 8.57mm ± 1.59 frozen p=0.035)

The mean birthweight did not present statistically significant differences (3239.21 ± 550.43 fresh; 3224.56 ± 570.83 frozen p=0.211). There were also no differences regarding macrosomy (7.1% fresh; 6.3% frozen p=0.317), LGA (6.0% fresh; 6.7% frozen p=0.866), pre-term birth (10.9% fresh; 9.0% frozen p=0.988), very pre-term birth (0.8% fresh; 1.3% frozen p=0.999), and extremely pre-term birth (0% fresh; 1.0% frozen p=0.998).

There were statistically significant differences regarding underweight (10.0% fresh; 7.0% frozen p=0.020), but there were no differences in very low weight (0.6 fresh; 1.1% frozen p=0.972) and SGA (1.9% fresh; 0.7% frozen p=0.432).

Limitations, reasons for caution: Despite a quasi-experimental design, the synchronization in fresh embryo transfer drove to a longer preparation with a thicker endometrium. It's not possible to rule-out the influence in the results of this parameter.

Wider implications of the findings: As a hypothesis, the increase in birthweight and/or an abnormal placentation in FET could be explained by the endometrial preparation more than the freezing process. Studies must be planned in the future to explore the possibility of changes in the birthweight between embryos transferred in natural vs artificial endometrial preparations.

Trial registration number: Not applicable