Summary answer: Prolonged cryopreservation of vitrified blastocysts up to 24 months increased the incidences of clinical pregnancy, ongoing pregnancy, and live birth, while decreased early miscarriage rate.

What is known already: Vitrification is adopted as the dominant approach for cryopreservation of human oocytes and embryos. However, little is known about the potential effect of prolonged storage after vitrification on the genomic integrity and metabolism of embryos. Several studies have sought to decipher the effect of cryopreservation duration on IVF pregnancy outcomes, but few were confined to vitrification and the results were inconsistent.

Study design, size, duration: This retrospective study included 6722 patients undergoing their first vitrified-warmed blastocyst transfer (VBT) cycles from January 2015 to June 2019 in a single fertility center in South China. The study was approved by the hospital's Ethics Committee.

Participants/materials, setting, methods: A total of 6722 eligible patients were divided into five groups according to the storage duration after vitrification: Group I: 0-3 months; Group II: 3-6 months; Group III: 6-12 months; Group IV: 12-24 months; Group V: 24-36 months. The IVF pregnancy outcomes were compared between groups. Multivariate logistic regression was conducted to evaluate the independent effect of storage duration on pregnancy outcomes.

Main results and the role of chance: The odds of clinical pregnancy outcomes were similar from Group 1 to 4. However, the chance of clinical pregnancy (Group 1 as reference; Group 2: adjusted odds ratio (aOR)= 1.04, 95% CI 0.93-1.17; Group 3: aOR = 1.02, 95% CI 0.84-1.25; Group 4: aOR = 0.93, 95% CI 0.66-1.31; Group 5: aOR = 0.54, 95% CI 0.38-0.76) , ongoing pregnancy (Group 2: aOR=0.99, 95% CI 0.89-1.11; Group 3: aOR = 0.94, 95% CI 0.77-1.14; Group 4: aOR = 0.87, 95% CI 0.62-1.22; Group 5: aOR = 0.41, 95% CI 0.29-0.60), and live birth rate (Group 2: aOR=1.00, 95% CI 0.89-1.12; Group 3: aOR = 0.98, 95% CI 0.81-1.19; Group 4: aOR = 0.91, 95% CI 0.65-1.27; Group 5: aOR = 0.46, 95% CI 0.32-0.66) significantly decreased, while the early miscarriage rate (Group 2: aOR=1.11, 95% CI 0.92-1.35; Group 3: aOR =1.25, 95% CI 0.92-1.70; Group 4: aOR = 1.33, 95% CI 0.77-2.31; Group 5: aOR = 2.42, 95% CI 1.36-4.31) significantly increased as the storage duration increased up to 24-36 months.

Limitations, reasons for caution: The primary limitation of this study was its retrospective nature. Besides, as all these data come from a single IVF treatment center, the results should be confirmed by a larger multicenter study.

Wider implications of the findings: Our study provides more evidence about the negative impact of long-term storage of vitrified embryos on the clinical outcome. Clinicians should adapt FET strategies based on the embryo storage duration.

Trial registration number: not applicable

P-194 Impact of cryopreservation duration on pregnancy outcomes of vitrified-warmed blastocysts transfer using an open-device system

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Study question: Is there a negative effect of long-term cryopreservation upon pregnancy outcomes after transfer of vitrified-warmed blastocysts stored in an open-device system?