

P140. Morula-stage embryo vitrification in cryopreservation cycles: five years of positive experience

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Context: World-wide clinical application of blastocyst cryopreservation is explained by relatively high pregnancy rates, but is as well associated with cycle cancellation due to reduced embryo quality or failure of blastulation. At the stage of morula embryo requires less technical manipulations during cryopreservation process, thus, might have better survival rates in frozen-thawed embryo transfer (FET) cycles when compared to blastocyst.

Objective: was to determine if day 4 (morula) is equally efficient to day 5 (blastocyst) embryo cryopreservation and, thereby, be implemented to routine in vitro fertilization (IVF) practice.

Methods: We performed a retrospective analysis of 1368 FET conducted at the IVF department between January 2011 and June 2017.

Patient(s): The study groups consisted of women undergoing FET whose embryos had been vitrified during preceding fresh IVF cycle on cultivation day 4 (morula, group 1, n=1328) or day 5 (blastocyst, group 2, n=91). Cycles with donor oocyte, surrogacy or genetic diagnostics were excluded. Embryos were thawed/cultivated 18-24 hours (group 1) and 2-4 hours (group 2) before ET.

Intervention(s): None

Main Outcome Measure(s): of the study was clinical pregnancy rate (CPR) per FET.

Result(s): During the past 6 years the majority (91.5%) of FET cycles at our unit were performed after morula-stage embryo thawing and resulted in an overall CPR of 27.3%. Cycle cancelation rate, as well as embryo survival rate post-thawing, did not differ between group 1 and group 2 (92.3% vs. 93.4%, $p=0.63$). In 74.2% of cases morula-stage embryos resumed development to blastocyst after overnight culture. We failed to demonstrate any significant differences in CPR between the groups (27.6% vs. 23.1%, $p=0.56$). The linear regression model showed the impact of the timing of FET on CPR, which improved in our clinic from 2011 to 2016 ($r=0.14$, $p<0.0001$). When adjusting to the number of embryos transferred, day 5 compared to day 4 FET was associated with equivalent multiple pregnancy rates (odds ratio 1.2; 95% CI 0.89-1.37).

Conclusions: Morula vitrification and thawing offer a simple approach for embryo selection in cryopreservation programs and, concerning acceptable pregnancy rates, can be successfully applied in clinical practice. However, a relatively small group 2 size limits the generalizability of the obtained results. Further trials may estimate the cost-effectiveness and other clinical applications of day 4 vitrification.

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