EXPERIMENTAL STUDY

Effect of the Developmental Stage and Thawing Temperature on the Survival and Development of the Vitrified Embryos

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Abstract

Objectives

The best developmental stage and the best thawing protocol suitable for cryopreservation of the early embryos are not well documented. The present study aimed at evaluating the effect of the ultra rapid cryopreservation (vitrification) technique, followed by slow or fast thawing protocol, on the fertilized ova, 4-cell embryos and morula.

Methods

The vitrification method included equilibrating the ova in the vitrification solution (EFS40; consisted of 40% ethylene glycol, 30% Ficoll, 0.5 M sucrose in D-PBS) for 2 minutes before immersion in liquid nitrogen. Slow and fast thawing were done and the cryoprotectants were withdrawn by a hyperosmolar sucrose solution, which was then gradually diluted and replaced by culture medium.

Results

The best results were obtained with vitrification of the 4-cell embryos both with slow and fast thawing, which gave survival rate of 86% and 94%, and in vitro development rate of 74% and 80%, respectively. Fast thawing showed better survival rates (80%, 94%, 77%) and better in vitro development rates (60%, 80%, 63%) than those of slow thawing, following vitrification of the fertilized ova, 4-cell embryos and morula, respectively.

Conclusion

These criteria of vitrification/ thawing could be inferred to the human 4-cell embryos in the IVF protocol.

Key words: Development rate, Embryos, Fertilized ova, Mice, Morula, Survival rate, Thawing, Vitrification

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