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Influence of storage period of vitrified embryos on clinical outcome

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Introduction

Frozen-thawed or vitrified-warmed embryo transfer (FET) in ART has been recently increasing with not only an advancement of cryopreservation technique such as vitrification, but also a trend of single embryo transfer (SET) to prevent multiple pregnancy. Cryopreservation of embryos by slow freezing method has been used more than 30 years and the influence of this method has been evaluated. However, vittrificaion is a relatively new technique and influence of vitrification on clinical outcome has not been elucidated. The present study was conducted to investigate the influence of vitrification on laboratory and clinical outcomes depending on the period of storage in the stage of 2PN, cleaved embryo and blastocyst. .

Material & methods

In 3392 FET cycles of SET (1674 patients), 8796 embryos (6069 2PNs, 1573 cleaved embryos and 1154 blastocysts) were warmed for transfer from January 2010 to December 2012. Data obtained from these embryos were analyzed retrospectively. Those embryos were divided into 4 groups based on the storage period, A: <1 year, B: 1-2 years, C: 2-3 years, D: >3 years. Survival after warming in each period was compared in each stage of embryos. Moreover, the influence of storage period on the rates pregnancy and live birth were compared.

Results

1. Survival rates in group A, B, C, D and average were as follows. 2PN: 98.0%, 98.7%, 100.0%, 100.0% and 98.1%. Cleaved embryo: 96.3%, 95.1%, 94.9%, 100.0% and 96.1%, respectively. Blastocyst: 97.9%, 97.8%, 100.0%, 100.0% and 97.9%, respectively. There were no significant differences among these 4 groups in each stage.

2. Pregnancy rates in group A, B, C, D and average were as follows. Cleaved embryos: 32.6%, 42.9%, 26.7 % and 25.0% and 33.0%. Blastocyst: 42.9%, 45.7%, 56.3% and 41.7%, and 43.7%, respectively. Live birth rates were as follows. Cleaved embryos: 76.5%, 83.3 %, 100.0%, 50.0%, and 77.1%. Blastocyst: 80.5%, 79.3%, 77.8%, 60.0%, and 80.0%, respectively. There were no significant differences among 4 groups either in cleaved embryo or blastocyst.

Conclusions

The present study suggested that cryopreservation of embryos at any stages by vitrification had no detrimental effect on cryosurvival and clinical outcome regardless of storage period for at least 3 years. The longest period was 5 years and 6 months with healthy baby born. Vitrification is very effective, laboratory friendly and safe cryopreservation method.