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Oocyte Vitrification Is a Strategical Option For Patients Who Undergo Autologous Mitochondrial Transfer Due To Poor Oocyte/Embryo Quality And Poor Ovarian Response.

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Objective: Autologous mitochondria transfer recently came into practical use as a new fertility treatment for patients with recurrent failures due to poor oocyte/embryo quality. Many of those patients show poor ovarian response and cannot produce enough number of oocytes in the cycle of mitochondrial transfer. In this study, we evaluated the impact of oocyte vitrification on fertilization and embryonic developmental competence in autologous mitochondrial transfer into mature oocytes.

Materials and Methods: Fourteen poor responders (40.6 years old ranged from 31 to 47) with recurrent failure due to low oocyte /embryo quality who underwent the mitochondrial transfer treatment were included in this study. Mature oocytes were vitrified and accumulated using a closed vitrification device (Cryotop®CL, KITAZATO®) before the treatment cycle in poor responders. Then, the mitochondrial transfer was conducted into vitrified and fresh oocytes. The autologous mitochondria extracted from egg precursor cells in patients' own ovarian cortical tissues were injected with sperm at the timing of intracytoplasmic sperm injection to 63 fresh and 74 vitrified-warmed oocytes.

Results: The average duration for cryopreservation of oocytes was 108.9±48.0 days and the survival rate of vitrified-warmed oocytes was 97.3% (74/78). The rates of normal, abnormal fertilization and morphologically good embryo were 71.7±35.0, 6.6±11.3 and 29.6±26.0% (fresh oocytes, respectively) and 69.7±18.7, 11.8±18.7 and 41.4±29.2% (vitrified-warmed oocytes, respectively). There was no difference in terms of biological competence between the embryos produced from vitrified-warmed oocytes and those from fresh oocytes as recipients for autologous mitochondrial transfer.

Conclusions: The present study revealed that fertilization and embryonic developmental competence following autologous mitochondrial transfer into oocytes was not affected by oocyte vitrification.

Preparing larger number of vitrified oocytes in advance is an effective option in order to increase pregnancy chances in patients who undergo autologous mitochondrial transfer due to poor oocyte/embryo quality and poor ovarian response.

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