

VITRIFICATION HAD IMPAIR EFFECT ON THE MITOCHONDRIAL ENZYME ACTIVITY, TFAM GENE EXPRESSION AND ROS LEVEL OF MOUSE MII OOCYTE

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Abstract Body

Introduction: Mitochondria have an important role in the oocyte development, fertilization and function. The aim of this study was to evaluate the effect of vitrification-warming method on the oocyte quality, and embryo development and mitochondrial enzyme activity. **Material and methods:** The metaphase II (MII) oocytes were collected from oviduct of ovarian stimulated pregnant adult NMRI female mice and were divided into vitrified and non-vitrified groups. Vitrification was done using ethylene glycol, dimethylsulfoxide and sucrose as cryoprotectants. After warming of the oocytes were inseminated with capacitated spermatozoa derived from 7-8 weeks old adult male mice. Fertilization, embryo developmental rate, ROS level, the ratio expression of mitochondrial transcription factor A (TFAM) gene and mitochondrial cytochrome oxidase and succinate dehydrogenase activity were assessed and compared. **Results:** The fertilization rate and the percent of embryos reached to hatching stage were 83.30 and 49.42% in non-vitrified group than 79.88 and 45.66% in vitrified oocytes respectively. TFAM gene expression (0.33 ± 0.08 vs 0.1 ± 0.04) and mitochondrial intensity of cytochrome oxidase enzyme activity (178.13 ± 0.83 vs 160.38 ± 3.47) were significantly higher in non- vitrified oocytes than vitrified oocytes ($P < 0.05$) but there was no significant different between both groups regarding to intensity of succinate dehydrogenase enzyme activity. The ROS level was increased in vitrified MII oocytes (4.39 ± 0.11) comparing with non vitrified MII oocytes (2.64 ± 0.03 ; $P < 0.05$).