



## The Role of Coenzyme Q<sub>10</sub> on the Levels of Total Antioxidant Capacity and Superoxid Dismutase of Mouse Vitrified Pre-Antral Follicles

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**Background:** Cryopreservation can be used as an inspiring technique to preserve female fertility. Oxidative stress during cryopreservation can be neutralized by an antioxidant. The aim of the present study was to evaluate the effect of Coenzyme Q<sub>10</sub> (CoQ<sub>10</sub>) as a potent antioxidant on the developmental competence and oxidative status of mouse vitrified pre-antral follicles.

**Methods and materials:** Isolated Preantral follicles of 14 days old mice were divided into vitrified and fresh groups. Each group was subjected to *in vitro* Culture with or without CoQ<sub>10</sub> for 12 days followed by adding human chronic gonadotropin to induce ovulation. In parallel, the amount of total antioxidant capacity (TAC) levels and superoxide dismutase (SOD) were assessed.

**Results:** The rates of survival, antrum formation, and metaphase II oocytes were significantly higher in CoQ<sub>10</sub>-supplemented groups compared to those of not treated CoQ<sub>10</sub> groups. TAC and SOD were decreased significantly during the culture period up to 96 h in the absence of CoQ<sub>10</sub> in both vitrified and non-vitrified pre-antral follicles. However, with pretreatment of CoQ<sub>10</sub>, TAC and SOD levels were increased significantly compared to respective groups without pretreatment of CoQ<sub>10</sub>.

**Conclusion:** It seems that maturation medium supplemented with coenzyme Q<sub>10</sub>, enhance the developmental competence of fresh and vitrified pre-antral follicles via increasing the levels of TAC and SOD.

**Keywords:** Vitrification, Pre-antral follicle, Coenzyme Q<sub>10</sub>, Oxidative Stress