

## **CAN WE DELAY OOCYTE AGING: ROLE OF COENZYME Q10**

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### **Abstract Body**

The main factors affecting women undergoing IVF treatments are age, oocyte quality and ovarian reserve. It is well known that decline in ovarian function accelerates during mid-30s. Oocyte is highly influenced by its granulosa cells as well as the environmental status of its surroundings (biochemical interactions with the follicular fluid). Oocyte aging disrupts meiotic spindle, shortens length telomeres, produces DNA damage by oxidative stress, mitochondrial DNA mutations and embryos arrests and fragmentation.

The oocyte has the largest number of mitochondria and mitochondrial DNA (mtDNA) of any cell. During maturation, oocyte suffers a cytoplasm maturation, which requires high amount of energy. Older infertility patients have insufficient mitochondrial activity and so, low ATP production. It has been suggested that deficiency in ATP levels can cause meiotic spindle, embryo aneuploidy and implantation failure.

Oocyte obtains its energy mostly from mitochondria via oxidative phosphorylation (OP). One of the products of the OP chain is the reactive oxygen species (ROS), which participate in oocyte aging. Coenzyme Q10 (CoQ10) is a molecule synthesized within de mitochondria and is used for antioxidant defence. It is also an essential component of electron transport chain involved in energy production, and decreases in human after 30 years of age. This data coincide with the loss of fecundity and the increase of embryo aneuploidy.

A balance between oxidants and antioxidants must be maintained. Decrease in CoQ10 concentrations lead to an increase in ROS and therefore mitochondrial dysfunction and compromised embryo development.

Data suggest that supplementation with CoQ10, an antioxidant supplement, can improve oocyte quality in a certain group of patients such as advanced age women, PCOS and obesity.