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Title: L Carnitine has a potent antioxidant effect in the mouse embryos culture media
Objective: Oxidative stress is involved in the etiopathogenesis of defective embryo development. ROS may originate in the embryo or from the extraneous factors. Hydrogen peroxide (H$_2$O$_2$) at concentrations >200μM has been reported to cause embryo block and apoptosis. Strategies to reduce ROS production, by addition of free radical scavengers and/ or lowering the oxygen tension are important for improving the fertility potential in an IVF setting. L-Carnitine has antioxidant activity that combines both free radical scavenging and metal-chelating properties. There are no reports investigating the role of L-Carnitine on the developing embryos. Our objective was to investigate the role of antioxidant activity of L Carnitine on mouse embryos culture media by exogenous induction of oxidative stress using hydrogen peroxide (H$_2$O$_2$).

Design: Prospective in vitro study.

Materials and Methods: A total of 140 mouse embryos (4 to 8-cell) were randomly assigned into 4 groups: group 1: control (HTF media only); groups 2 (H$_2$O$_2$ 500μM) group 3-4: (H$_2$O$_2$ 500μM + LC (0.3 and 0.6 mg/mL). LC concentrations were not embryotoxic based on our pilot study. Embryos were incubated at 37°C in 5%CO$_2$. Assessment of embryo development was done by examining the percentage blastocyst development rate (%BDR). Detection of apoptosis was done after TUNEL staining and measuring the % of damaged blastomeres using confocal microscopy.

Results: Comparison of %BDR and apoptosis between control, H$_2$O$_2$ alone, and H$_2$O$_2$ + Carnitine are shown in the table.

Conclusions: LC has a strong antioxidant effect on embryo development. It can neutralize the embryotoxic effects of oxidative stress induced by hydrogen peroxide. Supplementation of LC in culture media may offer a novel approach to minimize oxidative stress and thereby improve IVF outcome.

Support: None.