Title: L-Carnitine as an antiapoptotic supplement in mouse embryo culture media
Objective: Human embryos generated from in vitro fertilization (IVF) show varying degrees of cytoplasmic fragmentation. Reports suggest that cytoplasmic fragmentation in human embryos arises from apoptosis. Mitochondrial membrane potential and energy production in preimplantation embryos have recently been the focus of many studies. L-Carnitine (LC) has no major side effects on embryonic cells, interactions with other drugs or teratogenicity. It acts by stabilizing the mitochondrial membrane and protecting the cell from apoptosis. The aim of our study was to investigate the antiapoptotic effect of LC supplementation in mouse embryo culture media.

Design: Prospective in vitro study

Materials and Methods: A total of 240 mouse embryos (8-cell) were randomly assigned into 4 groups: group 1: control (HTF media only); groups 2 (Actinomycin D 5 ng/mL; dose based on previous literature) group 3-4: (Actinomycin D 5ng/mL + two concentrations of LC (0.3 and 0.6 mg/mL). LC concentrations were based on pilot study by our group to optimize the dose of LC in mouse embryo culture media. Embryos were incubated at 37°C in 5%CO₂, Assessment of embryos development was done after 48 hours by examining the percentage blastocyst development rate (%BDR). After TUNEL staining, the blastocysts were examined by confocal microscopy. Apoptosis was measured by examining the percentage of TUNEL positive blastomeres.

Results: Comparison of %BDR and apoptosis between control, actinomycin alone, and actinomycin + Carnitine are shown in the table

Conclusions: L-Carnitine improves the blastocyst development rate and reduces apoptosis. Supplementing in vitro culture media with L-Carnitine may improve the fertilization outcome.

Support: None