

EFFECTS OF MYO-INOSITOL ALONE AND IN COMBINATION WITH SELENO-L-METHIONINE ON CADMIUM-INDUCED TESTICULAR DAMAGE IN MICE

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Introduction: Cadmium (Cd) impairs gametogenesis and damages blood-testis barrier. As the primary mechanism of Cd-induced damage is oxidative stress, the effects of two natural antioxidants, myo-inositol (MI) and seleno-L-methionine (Se), were evaluated in mice testes.

Materials and method: Eighty-four male C57BL/6J mice were divided into twelve groups: 0.9% NaCl (vehicle; 1ml/kg/day i.p.); Se (0.2mg/kg/day per os); Se (0.4mg/kg/day per os); MI (360 mg/kg/day per os); MI plus Se (0.2mg/kg/day); MI plus Se (0.4mg/kg/day); CdCl₂(2mg/kg/day i.p.) plus vehicle; CdCl₂plus MI; CdCl₂plus Se (0.2mg/kg/day); CdCl₂plus Se (0.4mg/kg/day); CdCl₂plus MI plus Se (0.2mg/kg/day); CdCl₂plus MI plus Se (0.4mg/kg/day). After 14days, testes were processed for biochemical, structural and immunohistochemical analysis.

Results: CdCl₂increased inducible nitric oxide synthases (iNOS) and tumor necrosis factor- α (TNF- α) expression and malondialdehyde (MDA) levels, lowered glutathione (GSH) and testosterone, induced testicular lesions, and almost eliminated claudin-1 immunoreactivity. Se administration at 0.2or 0.4mg/kg significantly reduced iNOS and TNF- α expression, maintained GSH, MDA and testosterone levels, structural changes and low claudin-1 immunoreactivity. MI alone or associated with Se at 0.2or 0.4mg/kg significantly reduced iNOS and TNF- α expression and MDA levels, increased GSH and testosterone levels, ameliorated structural organization and increased claudin-1 patches number.

Discussion and conclusion: We demonstrated a protective effect of MI, a minor role of Se and an evident positive role of the association between MI and Se on Cd-induced damages of testis. MI alone or associated with Se might protect testes in subjects exposed to toxicants, at least to those with behavior similar to Cd. Also, our data warrant future studies to explore gonadal protection from exposure to other environmental toxicants, at least to those with mechanism of action similar to Cd.