-Protective effects of thymoquinone and l-cysteine on cadmium induced reproductive toxicity in rats

Manal M Sayed, Khaled MA Hassanein, Waleed Senosy

Abstract:

This study was conducted to investigate the possible protective role of thymoquinone (TQ) and l-cysteine on the reproductive toxicity of male rats induced by cadmium chloride (CdCl2). Forty rats were divided into four even groups. The first group served as untreated control. The second, third and fourth groups received CdCl2, CdCl2 and TQ, and CdCl2 and l-cysteine, respectively for 56 days. Cd exposure caused spermatological damage (decrease sperm count and motility and increased the rates of sperm abnormalities), decrease serum testosterone level and increased oxidative stress. Histological alterations were also observed in the form of vascular and cellular changes in CdCl2 treated rats. The vascular changes were congestion of the blood vessels with interstitial edema in the testes, epididymis, seminal vesicle and prostate. The cellular changes were in the form of degenerative changes with presence of multinucleated giant cells in the lumen of seminiferous tubules, vacuolation and sloughing of the lining epithelium of the epididymis, seminal vesiculitis and prostatitis. Co-administration of TQ and l-cysteine with CdCl2 increased glutathione (GSH), superoxide dismutase (SOD), catalase (CAT) and testosterone and reduced lipid peroxidation (LPO) activity. In conclusion, our results showed that TQ and l-cysteine can ameliorate the deleterious effects of CdCl2 probably by activating testicular endocrine and antioxidant systems.

Keywords:

Cadmium; Thymoquinone; l-cysteine; Histopathology; Antioxidants

Published In:

Toxicology Reports, 1, 612-620