

Effect of Visnagin on Altered Steroidogenesis and Spermatogenesis, and Testicular Injury Induced by the Heavy Metal Lead

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Abstract : Background: Lead (Pb) is an environmental pollutant causing serious health problems, including impairment of reproduction. Visnagin (VIS) is a furanochromone with promising antioxidant and anti-inflammatory effects; however, its protective efficacy against Pb toxicity has not been investigated. Objective: This study evaluated the protective effect of VIS on Pb reproductive toxicity, impaired steroidogenesis and spermatogenesis, oxidative stress and inflammation. Methods: Rats received VIS (30 or 60 mg/kg) and 50 mg/kg lead acetate for 3 weeks, and blood and testes samples were collected. Results: Pb intoxication impaired the pituitary-testicular axis (PTA), manifested by the decreased serum levels of gonadotropins and testosterone. Pb decreased sperm count, motility and viability, increased sperm abnormalities, and downregulated the steroidogenesis markers StAR, CYP17A1, 3 β -HSD and 17 β -HSD in the testis of rats. VIS significantly increased serum gonadotropins and testosterone, alleviated sperm parameters and upregulated steroidogenesis. In addition, VIS decreased pro-inflammatory cytokines, testicular lipid peroxidation and DNA fragmentation, downregulated Bax, and enhanced antioxidants and Bcl-2 Conclusion: These results demonstrate the protective effect of VIS against Pb reproductive toxicity in rats. VIS improved serum gonadotropins and testosterone, enhanced steroidogenesis and spermatogenesis, and attenuated oxidative injury, inflammation and apoptosis. Therefore, VIS is a promising candidate for the protection against Pb-induced reproduction impairment.

Keywords : pituitary-gonadal axis, cytokines, DNA damage, apoptosis

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