Antioxidant effect of vitamin E treatment on some heavy metals-induced renal and testicular injuries in male mice

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Abstract Toxic heavy metals in water, air and soil are global problems that are a growing threat to humanity. Heavy metals are widely distributed in the environment and some of them occur in food, water, air and tissues even in the absence of occupational exposure. The antioxidant and protective influences of vitamin E on a mixture of some heavy metals (Pb, Hg, Cd and Cu)-induced oxidative stress and renal and testicular injuries were evaluated in male mice. Exposure of mice to these heavy metals in drinking water for seven weeks resulted in statistical increases of plasma creatinine, urea and uric acid concentrations. The levels of glutathione (GSH) and superoxide dismutases (SOD) in kidney and testis tissues were significantly declined. Moreover, the histopathological evaluation of kidney and testis showed severe changes in mice treated with these heavy metals. Administration of vitamin E protected the kidney and testis of mice exposed to heavy metals as evidenced by appearance of normal histological structures, insignificant changes in the values of plasma creatinine, urea and uric acid, and the levels of kidney GSH and SOD, while the levels of testis GSH and SOD were notably decreased. These data suggest that the administration of vitamin E protects against heavy metals-induced renal and testicular oxidative stress and injuries.

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