



ORIGINAL ARTICLE

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

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Received 2 October 2010; accepted 9 October 2010  
Available online 16 October 2010

## KEYWORDS

Antioxidant;  
Vitamin E;  
Heavy metals;  
Kidney;  
Testis;  
Mice

**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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## 1. Introduction

Environmental pollution is the contamination of the ecosystem that causes instability, disorder, harm or discomfort to the

physical systems or living organisms. Environmental factors have important links with infectious as well as non-infectious diseases of both acute and chronic nature. Global burden of disease attributable to selected sources of environment like water sanitation and hygiene, urban outdoor and indoor pollution, occupational carcinogens, noise and airborne particulates has been assessed to be 8–9%, measured either in terms of mortality or disability adjusted life years (DALYs). DALYs incorporates number of years lived with a disability due to disease or injury, weighted according to its severity (Ezzati et al., 2002). The increase in pollution is a major and global problem. This is due to the use of toxic chemicals or xenobiotic substances or by certain synthetic compounds such as heavy metallic compounds (Foulkes, 1990; Jagadeesan and Pillai,

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