The protective role of folic acid against testicular dysfunction in lead-intoxicated rat model

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Abstract:

There is an increasing concern over male reproductive toxicity caused by lead exposure. Folic acid (FA) is supposed to be a promising therapeutic strategy against lead toxicity. Therefore, the aim of this experimental study was to shed light on the potential protective role of FA on lead-induced testicular dysfunction in rats and its possible underlying mechanistic pathways. Rats (n= 24) were divided into four groups: Control, FA, Lead, and FA+ Lead group. After 4 weeks, lead intoxication resulted in a marked reduction in the relative testicular weight and the serum level of testosterone, an impairment in the characters of semen analysis, and an increased content of lead, malondialdehyde and both interleukin-6 and-10 and a decreased antioxidant enzyme levels in the testicular tissue homogenate. Furthermore, marked degenerative histological changes and an increased expression of NF-κB were also noticed in the testicular tissue of Lead group. Supplementation of FA in association with lead considerably alleviated these adverse outcome responses most probably owing to its cytoprotective ability as emerged from combating the oxidative stress and inflammatory reactions. We concluded that FA could act as a highly effective fighting approach against lead-associated testicular toxicity.

Keywords:

Folic acid — Lead — NF-κB — Oxidative stress — Semen analysis

Published In:

General Physiology and Biophysics, issue 3, Volume 36, 297-308