



Short communication

Acute doxorubicin nephrotoxicity in rats with malignant neoplasm can be successfully treated with fullereneol C₆₀(OH)₂₄ *via* suppression of oxidative stress

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Abstract:

Oxidative stress has an important role in the pathogenesis of doxorubicin (DOX)-induced nephrotoxicity. The aim of this study was to investigate the nephroprotective effects of fullereneol (FLR), an antioxidant agent, on DOX-induced nephrotoxicity.

The investigation was carried out on adult female Sprague Dawley outbred rats with chemically induced breast cancer (1-methyl-1-nitrosourea; 50 mg/kg; *ip*). Rats were divided into the following groups: control healthy, control cancer, DOX alone (8 mg/kg, *ip*, cancer), DOX plus FLR as a pre-treatment (8 mg/kg and 100 mg/kg, respectively, *ip*, cancer), and FLR alone (100 mg/kg, *ip*, cancer). At the end of the 2nd day after drug administration, blood and kidney tissues were taken for analysis. The activity of lactate dehydrogenase and α -hydroxybutyrate dehydrogenase as serum enzymes, as well as level of malondialdehyde, glutathione, glutathione peroxidase, glutathione reductases, catalase and superoxide dismutase, were determined.

DOX caused nephrotoxicity, but FLR pre-treatment prevented oxidative stress, lipid peroxidation and the disbalance of GSH/GSSG levels in kidney tissue caused by DOX. Our results confirm satisfactory nephroprotective efficacy of FLR in the acute phase of toxicity and encourage further studies regarding its use as a potential nephroprotector.

Key words:

doxorubicin, nephrotoxicity, fullereneol, oxidative stress, kidney, rats, mammary carcinomas
