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Sinapic Acid Attenuation of Cyclophosphamide-Induced Liver Toxicity in Mice by Modulating Oxidative Stress, Nf-κB, and Caspase-3

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Abstract : Objective(s): Cyclophosphamide (CP), as an antineoplastic drug, is widely used in cancer patients, and liver toxicity is one of its complications. Sinapic acid (SA), as a natural phenylpropanoid, has antioxidant, anti-inflammatory, and anti-cancer properties. Materials and Methods: The purpose of the current study was to determine the protective effect of SA versus CP-induced liver toxicity. In this research, BALB/c mice were treated with SA (5 and 10 mg/kg) orally for one week, and CP (200 mg/kg) was injected on day 3 of the study. Oxidative stress markers, serum liver-specific enzymes, histopathological features, caspase-3, and nuclear factor kappa-B cells were then checked. Results: CP induced hepatotoxicity in mice and showed structural changes in liver tissue. CP significantly increased liver enzymes and lipid peroxidation and decreased glutathione. The immunoreactivity of caspase-3 and nuclear factor kappa-B cells was significantly increased. Administration of SA significantly maintained histochemical parameters and liver function enzymes in mice treated with CP. Immunohistochemical examination showed SA reduced apoptosis and inflammation. Conclusion: The data confirmed that SA with anti-apoptotic, anti-oxidative, and anti-inflammatory activities was able to preserve CP-induced liver injury in mice.

Keywords : apoptosis, cyclophosphamide, liver injury, inflammation, oxidative stress, sinapic acid
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