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Histopathological and Biochemical Investigations of Protective Role of Honey in Rats with Experimental Aflatoxicosis

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Abstract : The aim of this study was to investigate the antioxidant properties and protective role of honey, considered a part of traditional medicine, against carcinogen chemical aflatoxin (AF) exposure in rats, which were evaluated by histopathological changes in liver and kidney, measuring level of serum marker enzymes [aspartate aminotransferase (AST), alanin aminotransferase (ALT), gamma glutamil transpeptidase (GGT)], antioxidant defense systems [Reduced glutathione (GSH), glutathione reductase (GR), superoxide dismutase (SOD), glutathione-S-transferase (GST) and catalase (CAT)], and lipid peroxidation content in liver, erythrocyte, brain, kidney, heart and lungs. For this purpose, a total of eighteen healthy Sprague-Dawley rats were randomly allocated into three experimental groups: A (Control), B (AF-treated) and C (AF+honey-treated). While rats in group A were fed with a diet without AF, B, and C groups received 25 µg of AF/rat/day, where C group additionally received 1 mL/kg of honey by gavage for 90 days. At the end of the 90-day experimental period, we found that the honey supplementation decreased the lipid peroxidation and the levels of enzyme associated with liver damage, increased enzymatic and non-enzymatic antioxidants in the AF+honey-treated rats. Hepatoprotective and nephroprotective effects of honey is further substantiated by showing almost normal histological architecture in AF+honey-treated group, compared to degenerative changes in the liver and kidney of AF-treated rats. Additionally, honey supplementation ameliorated antioxidant defense systems and lipid peroxidation content in other tissues of AF+honey-treated rats. In conclusion, the present study indicates that honey has a hepatoprotective and nephroprotective effect in rats with experimental aflatoxicosis due to its antioxidant activity.

Keywords : aflatoxicosis, honey, histopathology, malondialdehyde, antioxidant, rat
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