

Dietary Importance of Lycopene Against Carbon Tetrachloride Induced Hepatotoxicity in Rats

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Abstract

Chronic liver disease is a clinically silent condition that causes significant morbidity and mortality around the world. This study aimed to investigate the dietary importance of lycopene against Carbon Tetrachloride inducing hepatotoxicity in rats. Thirty five albino rats were divided randomly for two groups. The first group G1(7 rats), its diet was only basic diet, considering it negative control group. The remaining of rats injected with a subcutaneous of carbon tetrachloride (2ml/ kg b.w./ week) for two weeks to induce hepatic damage. After injected animals, they divided for 4 subgroups (7 rats/ once). Rats in G2 considered as positive control. Rats in G3, G4, G5 fed on the basal diet contained different levels of dried tomato and ketchup 5%, 7.5% and 10%, respectively. After eight weeks, liver and kidney functions were evaluated. Antioxidant activity was estimated, in addition to histological examination of liver tissues. The results indicated that there were significantly increasing in the levels of ALT, AST, ALP, albumin, total and direct bilirubin in G2 when compared with G1, while G3, G4 and G5 showed significant decreasing in the levels compared to positive control group. Urea nitrogen and creatinine levels in G2 showed significant increasing comparing with negative control group, the improvement were noticeable in all examined groups comparing to positive control group. Furthermore, the levels of GSH and CAT showed significant improvement in all tested groups comparing to the positive control one. The histological findings of liver tissues were consistent and confirmed the changes in the biochemical and oxidant/antioxidant parameters of the experimental groups. It could conclude, that there were noticeable improvements in the biochemical and histopathological changes resulting from exposure to CCl₄ in groups of rats whose diet contained dried tomatoes and ketchup. The results of the study scientifically proved that lycopene has significant therapeutic effects against liver damage caused by CCl₄, due to its antioxidant activity and flavonoid contents. Therefore, the recommendation of the study is increasing dietary lycopene intake may have a benefit for patients with liver disease.

Key words: lycopene, liver functions, liver injury, antioxidant mechanism.