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The protective effects of silymarin in 5-fluorouracil-ınduced hepatotoxicity and nephrotoxicity in rats

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Abstract

Silymarin as an antioxidant compound has hepatic and renal protection effects. Numerous studies have reported liver and kidney damage caused by 5-fluorouracil (5-FU). Hence, the present study aimed to evaluate the protective effects of silymarin against 5-FU-induced hepatotoxicity and nephrotoxicity. Rats were divided into three groups: control (distilled water + dimethyl sulfoxide1ml/day intraperitoneal for two weeks), 5-FU (distilled water + dimethyl sulfoxide1ml/day intraperitoneal from the first day to the end of the eighth day along with 20mg/kg of 5-FU from the ninth to the end of the study), and 5-FU + silymarin (50mg/kg silymarin /day intraperitoneal for 2 weeks along with 20mg/kg of 5-FU from the ninth day to the fourteenth day). At the end of the experiment, the rats were killed and blood samples were taken for measuring serum alanine aminotransferase (ALT), aspartate transaminase (AST), alkaline phosphatase (ALP), and lactate dehydrogenase (LDH), blood urea nitrogen (BUN), creatinine, and antioxidant activities. Also, liver and kidney tissues were sampled. Results revealed that the activities of ALP, ALT, AST, and LDH in the 5-FU group were higher than in the control group, while their activities were similar in both silymarin and control groups. The silymarin group had a significant decrease (20.64%) in urea compared to the 5-FU group. Also, the silymarin group had significant increases (37.47%) in total antioxidant capacity compared to the 5-FU group. Histopathological analyses of the liver revealed the hepatic focal necrosis and renal epithelial necrosis in the 5-FU group compared to the control group. However, there were not notable pathologic changes to liver and kidney tissues of the silymarin group. It was concluded that silymarin had the protective effects on 5-FU-induced hepatotoxicity and nephrotoxicity.

Keywords: 5-Fluorouracil, Silymarin, Hepatotoxicity, Nephrotoxicity

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