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Biochemical and immunological basis of silymarin effect, a milk thistle (Silybum marianum) against ethanol-induced oxidative damage.

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Abstract

Ethanol metabolism induces generation of excessive amount of reactive oxygen species (ROS) which results in immune dysfunction. We examined the efficacy of silymarin on ethanol-induced oxidative stress, immunomodulatory activity, and vascular function in mice blood. Effectiveness of silymarin was compared with potent antioxidant ascorbic acid. In the present study, 8- to 10-week-old male BALB/c mice (20-30 g) were divided into the four groups of six each. One group were fed with ethanol (1.6 g/kg body weight), while second group were fed with ethanol (1.6 g/kg body weight) and silybin (250 mg/kg body weight), and the third group were exposed to ethanol (250 mg/kg body weight) and ascorbic acid (250 mg/kg body weight) per day for 12 weeks. The control group was fed with isocaloric glucose solution instead of ethanol. Ethanol exposure significantly increased thiobarbituric acid reactive substance (TBARS) and nitrite levels besides glutathione-S-transferase (GST) activity, and significantly decreased reduced glutathione (GSH) content and the activities of superoxide dismutase (SOD), catalase (CAT), glutathione reductase (GR), and glutathione peroxidase (GPx) in whole blood hemolyzate, while silymarin treatment significantly normalized these altered parameters. Silymarin significantly prevented ethanol-induced, elevated activities of interleukin (IL)-10, tumor necrosis factor (TNF)-α, γ interferon (IFN-γ), vascular endothelial growth factor (VEGF)-A, and transforming growth factor (TGF)-β1, as well as decreased IL-4 activity in mice blood. These results were comparable with the activity of ascorbic acid.

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