Protective Effects of Ginkgo biloba; Panax ginseng; and Schizandra chinensis extract on liver injury in rats.

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Abstract

This study investigated the effects of the combined extracts of Ginkgo biloba, Panax ginseng, and Schizandra chinensis at different doses on hepatic antioxidant status and fibrosis in rats with carbon tetrachloride (CCl(4))-induced liver injury. Male Sprague-Dawley rats (n = 8-12 per group) were divided into the control, CCl(4), CCl(4) + silymarin (0.35%), CCl(4) + low-dose herbal extract (0.24% of Ginkgo biloba, Panax ginseng, and Schizandra chinensis extract at 1:1:1; LE), and CCl(4) + high-dose herbal extract (1.20% of the same herbal extract; HE) groups. Silymarin or herbal extract was orally given to rats a week before chronic intraperitoneal injection with CCl(4) for 6 weeks. The pathological results showed that herbal extract suppressed hepatic bile duct proliferation, and low-dose herbal extract inhibited liver fibrosis. Hepatic superoxide dismutase (SOD) activity was lower in the CCl(4) group, but there was no difference in the silymarin or herbal extract treated groups compared to the control group. Hepatic catalase activity and the ratio of reduced to oxidized glutathione were significantly higher ($p < 0.05$) in the HE group than those in the CCl(4) group. Silymarin and herbal extract reversed the impaired hepatic total antioxidant status ($p < 0.05$). Herbal extract partially reduced the elevated hepatic lipid peroxides. Hepatic transforming growth factor-beta1 (TGF-beta1) level decreased significantly ($p < 0.05$) in the LE group. Therefore, high-dose herbal extract improved hepatic antioxidant capacity through enhancing catalase activity and glutathione redox status, whereas low-dose herbal extract inhibited liver fibrosis through decreasing hepatic TGF-beta1 level in rats with CCl(4)-induced liver injury.