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**File: ■ Licorice (*Glycyrrhiza glabra*)  
■ Non-alcoholic Fatty Liver Disease**

**HC 051231-449**

**Date: May 31, 2012**

**RE: Licorice Root Extract Decreases Liver Enzyme Levels**

Hajiaghahmohammadi AK, Ziaee A, Samimi R. The efficacy of licorice root extract in decreasing transaminase activities in non-alcoholic fatty liver disease: a randomized controlled clinical trial. *Phytother Res.* 2012; [epub ahead of print]. doi:10.1002/ptr.3728.

Non-alcoholic fatty liver disease (NAFLD) can lead to cirrhosis and possible liver transplantation. A common liver disorder, NAFLD affects 20-40% of the Western population<sup>1</sup> (the Mayo Clinic Health Letter<sup>2</sup> estimates that the disorder affects "up to 20% of American adults") and 5-35% of those in Pacific and Asian countries.<sup>3</sup> Non-alcoholic steatohepatitis (NASH), is a type of progressive NAFLD, resulting in inflammation and liver scarring (fibrosis); such scars can harden the liver and impair its ability to function properly, a condition known as cirrhosis. Only about 5% of people with NAFLD develop cirrhosis, liver failure, or hepatocellular carcinoma. NASH is the third leading cause of cirrhosis in US adults, becoming a more common reason for liver transplants.<sup>2</sup>

Major risk factors for NAFLD are obesity, type 2 diabetes mellitus, dyslipidemia, and metabolic syndrome. Modification of risk factors is generally recommended for the disease. Licorice (*Glycyrrhiza glabra*) root has been used to treat stomach ulcers, bronchitis, and sore throat, as well as viral infections. Its major bioactive component, glycyrrhizin, possesses anti-inflammatory, antioxidant, and immune-modulating properties. Licorice has also been reported to reduce liver inflammation and hepatic injury; however, the mechanism for these properties is unclear. These authors conducted a randomized, double-blind clinical trial to investigate the effects of licorice on NAFLD.

The study was conducted at the Gastrointestinal and Liver Clinic of Qazvin in central Iran. The presence of NAFLD confirmed by sonography and the presence of elevated levels of the liver enzymes aspartate aminotransferase (AST) and alanine aminotransferase (ALT) were the inclusion criteria. All subjects underwent a complete history of drug and alcohol consumption and were checked for autoimmune hepatitis and viral markers.

Sixty-six patients (38 men and 28 women) were enrolled and completed the study. They were divided randomly into 2 groups:

- the treatment group (n=33), who received 1 capsule containing 2 g aqueous licorice root extract alone (20% glycyrrhizin) daily for 2 months (no other information is provided),
- and the control group (n=33), who received 1 capsule containing 2 g starch daily for 2 months.

Weight, body mass index (BMI), and liver transaminase levels were measured for each subject before and after the study. The mean age of the treatment group was 40 years and the mean age of the control group was 40.5 years.

The authors report that for the treatment group, the mean BMI decreased from 30 kg/m<sup>2</sup> at baseline to 29.20 kg/m<sup>2</sup> after treatment (P>0.05). In the control group, mean BMI increased from 29.10 kg/m<sup>2</sup> to 29.22 kg/m<sup>2</sup> (P>0.05).

The mean serum ALT level decreased from 65.09 IU/mL at baseline to 51.27 IU/mL after treatment with licorice (P<0.001). In the control group, the ALT level decreased (though not significantly) from 66.90 IU/mL to 62.77 IU/mL (P>0.05). The mean serum AST level decreased in both groups during the study: a significant drop was seen in the treatment group, from 58.18 IU/mL to 49.45 IU/mL (P<0.001); and a nonsignificant decrease was reported in the control group, from 57.86 IU/mL to 54.81 IU/mL (P>0.05).

Although no data are available on NAFLD treatment with licorice root extract, some studies have shown that glycyrrhizin could improve lipoprotein lipase expression, insulin sensitivity, and serum lipid levels in rats.<sup>4,5</sup>

According to the authors, the effect of licorice on liver histology (determined by liver biopsy) was not studied because of the invasiveness of the biopsy. Also, it is unclear whether the level of reduction in transaminases is clinically significant and whether transaminases are the best markers of NAFLD, say the authors.

Although the authors suggest that future studies could include more detailed tests of liver function and liver histology in addition to the measurement of liver enzymes, they conclude that licorice root extract appears safe and may be considered in the treatment of elevated liver enzymes in NAFLD.

—Shari Henson

#### References

- <sup>1</sup>Chitturi S, Farrell GC, Hashimoto E, et al. Non-alcoholic fatty liver disease in the Asia-Pacific region: definitions and overview of proposed guidelines. *J Gastroenterol Hepatol*. 2007;22(6):778-787.
- <sup>2</sup>Mayo Clinic Health Letter. Nonalcoholic fatty liver disease. A growing health concern. *Mayo Clin Health Lett*. 2012;30(3):1-3.
- <sup>3</sup>Shen L, Fan JG, Shao Y, et al. Prevalence of nonalcoholic fatty liver among administrative officers in Shanghai: an epidemiological survey. *World J Gastroenterol*. 2003;9(5):1106-1110.
- <sup>4</sup>Lim WY, Chia YY, Liong SY, Ton SH, Kadir KA, Husain SN. Lipoprotein lipase expression, serum lipid and tissue lipid deposition in orally-administered glycyrrhizic acid-treated rats. *Lipids Health Dis*. 2009;8:31. doi:10.1186/1476-511X-8-31.
- <sup>5</sup>Eu CH, Lim WY, Ton SH, Kadir KA. Glycyrrhizic acid improved lipoprotein lipase expression, insulin sensitivity, serum lipid and lipid deposition in high-fat diet-induced obese rats. *Lipids Health Dis*. 2010;9:81. doi:10.1186/1476-511X-9-81.

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