Zhenjiang aromatic vinegar prevents the alcohol liver disease in mice via autophagy

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Abstract

Alcoholic liver disease (ALD) is an ignored global issue of public health. It is urgent for searching bioactive foods to prevent ALD. Zhenjiang aromatic vinegar (ZAV) contained antioxidant compounds, including polyphenols, flavonoids, and melanoidins. The mechanism of ZAV on preventing acute liver injury was evaluated in alcohol-treated mice. Our results showed that ZAV ameliorated morphological damage by hematoxylin and eosin and Oil Red O staining in alcohol-treated liver. ZAV relieved symptoms of ALD, which presented as decreased serum triacylglycerol, total cholesterol, alanine transaminase, and aspartate aminotransferase levels. In addition, ZAV treatment inhibited hepatic oxidative stress levels by downregulating reactive oxygen species generation, and the oxidative products (malonaldehyde, 4-hydroxynonenal, and 8-hydroxydeoxyguanosine), and upregulating catalase, superoxide dismutase, glutathione, and glutathione peroxidase. ZAV further reduced production of tumor necrosis factor-α and monocyte chemoattractant protein-1, and elevated levels of interleukin-4 and transforming growth factor-β indicating the inhibition of alcohol-induced inflammation. Furthermore, ZAV treatment increased expression levels of autophagy-associated proteins in ALD mice by western blot, which participated in anti-ALD effect of ZAV. These findings demonstrate that ZAV could be an alternative for ALD intervention by regulating oxidative stress and autophagy. In this study, the mice model of ALD was used to investigate the mechanism of ZAV against liver injury. The data provided novel insights of ZAV on the prevention of acute alcoholic liver injury.

KEYWORDS autophagy, inflammation, liver injury, oxidative stress, vinegar