

Protective Effect of Alcalase Potato Protein Hydrolysate -APPH and Exercise on Hepatocyte
Apoptosis in High Fat Diet Aging Mice

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Abstract

Introduction: Obesity is associated with a complex systemic inflammatory state and it is considered to be a central that increase the risk for a vast array of diseases. Nonalcoholic fatty liver disease (NAFLD) is a common characterization in obesity. Notably, NAFLD occurs more often in the middle aged and in the elderly as the risk factors for NAFLD increases with aging. Hepatic apoptosis is one of the reasons for NAFLD-induced liver injury. A higher incidence of apoptosis also leads to hepatic fibrosis. Therefore, inhibition of hepatic apoptosis is a potential approach in treating NAFLD. As there are no drugs so far that effectively treat NAFLD, diet control, diet related treatment and regular exercise become more crucial in preventing NAFLD. Previous recent studies from our lab indicated that potato protein hydrolysate, derived from alcalase treatment (APPH), with lipolysis-stimulating activity, was found to have potential to act as an efficient anti-obesity diet ingredient. However, the effect and mechanisms behind the hepatic protection of supplementation combination on exercise treated in high fat diet (HFD) in vivo are unclear.

Methods: Our study is aimed to investigate the effects of APPH ameliorate hepatic apoptosis and fibrosis in diet induced aging mice. Forty-eight 6 months old SAMP8 were randomly divided into 6 groups: mice fed with standard chow, HFD induced mice, exercise, HFD with exercise, HFD with APPH and HFD with APPH combined exercise.

Results: Serum triglyceride levels and cholesterol were significantly decreased in mice fed with HFD with APPH combined exercise. The beneficial effect of HFD with APPH combined exercise groups was also observed in histology analyses by decrease accumulation of lipid droplets in the liver tissues. Cytochrome c and Caspase 3, were significantly lower in HFD with APPH combined exercise groups than HFD group.

Conclusions: Our results indicate that APPH combined exercise attenuated hepatic lipid accumulation and anti-apoptosis and fibrosis effects in HDF diet-induced mice which may have a therapeutic potential in the amelioration of NAFLD.

Keywords: Alcalase-Potato Protein hydrolysate (APPH), NAFLD, Exercise, Apoptosis