

Hypolipidemic, anti-oxidant and anti-inflammatory potentialities of the ginseng extracts according to the ratio of PD:PT in atherogenic Apo E KO mice

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The *Panax ginseng* C.A. Meyer. has been used in traditional medicine to enhance stamina and ability to remove fatigue and physical stress for thousands of years. Ginsenosides are the most active components isolated from ginseng and belong to damarane saponin which are separated into protopanaxadiols (PDs; Rb1, Rb2, Rc, Rd, Rg3, Rh2) and protopanaxatriols (PTs; Re, Rf, Rg1, Rg2, Rh1). To evaluate the effect on the differential PD:PT ratios in the atherogenic ApoE KO mice, PD:PT=1 and PD:PT=2 were artificially manipulated by differential combinations of the ginseng extract. Experimental atherogenesis was derived by the atherogenic diet (AD:1.25% cholesterol, 7.5% cocoa butter) for 2 months. PD:PT=1 and PD:PT=2 came from were intraperitoneally (i.p.) injected with dose of 100mg/kg/day for 1 month with AD. The vehicle-treated positive and negative control group fed an AD and administrated i.p. with physiological saline. The AD induced liver damage was significantly reduced by PD:PT=1. Plasma lipid profiles and atherogenic index were improved by ginseng extracts. The PD:PT=1 significantly decreased plasma TC by 77% compared to PD:PT=2 treated group. The level of heart TG and TC were significantly decreased in both PD:PT=1 and PD:PT=2 groups, while the level of hepatic TG was significantly decreased by PD:PT=2 compared to vehicle-treated negative control group. The level of MDA, which is used as an indicator of oxidative stress in cells and tissues, was significantly decreased by ginseng extracts while the hepatic MDA was significantly decreased by PD:PT=1. The MDA level in heart was significantly decreased by PD:PT=2 treatment compared to vehicle-treated negative control group. On the inflammation and apoptosis signaling pathway, both of PD:PT=1 and PD:PT=2 depressed NF-κB protein throughout the inhibition of phosphorylation of ERK1/2 and c-Jun. PD:PT=1 increased bcl-2 protein expression while PD:PT=2 depressed the caspase-8, caspase-9 and cleaved-PARP protein expression. In conclusion, the ginseng extract according to PD:PT ratio has been shown the hypolipidemic and anti-oxidant potentialities via inhibition of NF-κB signaling pathway and caspase family signaling pathway. Since above effects depend on the type of organ, the therapeutic supplementation might be tailored by the type of diseases.

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