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Influence of marine and leguminous protein hydrolysates on oxidative stress and some markers of inflammation in hypercholesterolemic rats

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It has been reported that many peptides that are released *in vitro* or *in vivo* from animal or plant proteins are bioactive and have regulatory functions in humans and animal model⁽¹⁾ including antimicrobial properties, blood pressure lowering effects, cholesterol lowering ability and antioxidative effects, enhancement of mineral absorption, immunomodulatory effect and opioid activities^(2,3). The aim of this study was to compare the efficiency of two protein hydrolysates produced from chickpea (*Cicer arietinum*) or sardine (*Sardina pilchardus*) on oxidative stress and some markers of inflammation in hypercholesterolemic rats.

12 male Wistar rats weighing 200 ± 15 g were fed a diet 20% casein combined with 10% sunflower oil, supplemented with 1% cholesterol and 0.5% cholic acid, divided into two groups, and received daily by gavage 1 g/kg BW of sardine (SPH) or chickpea (CPH) protein hydrolysates for 28 days.

Total cholesterol, triacylglycerols, albumin and uric acid were measured in serum and nitric oxide in aorta. Lipid and protein oxidation were determined in liver and heart by measuring their hydroperoxydes and carbonyl derivatives contents. Moreover, the antioxidant enzyme activities were estimated in heart and liver by measuring superoxide dismutase and glutathione reductase activity. Serum total cholesterol and triacylglycerols were 2.3-, 1.3-fold lower in SPH vs CPH groups, while uric acid and albumin concentrations were respectively 7.5- and 1.2-fold increased than that of obtained with CPH. Liver hydroperoxydes products were 1.3-fold decreased with CPH. However, in heart these values were 4-fold lower with SPH. Heart carbonyl derivatives contents were similar but these values were significantly decreased in liver of rats treated with SPH. In aorta, nitric oxide levels were 1.8-fold higher in CPH compared with SPH group. Furthermore, heart superoxide dismutase and glutathione reductase activity was respectively 1.3- and 2-fold higher with SPH vs CPH, whereas liver superoxide dismutase activity was 12-fold higher with CPH vs SPH.

These results indicated that sardine protein hydrolysates can stimulate efficiently protective mechanisms against free radical attack by modifying antioxidant enzyme activities in heart while those of chickpea reduce inflammation and improve aorta relaxation by enhancing its nitric oxide content.

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