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Effects of Cold Pressed Chia Seed Oil Intake on Hematological and Biochemical Biomarkers in Both Normal and Hypercholesterolemic Rabbits

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Abstract

Most of the studies on the beneficial effects of chia have been conducted with its seeds. There is less evidence about the effects of cold pressed chia seeds oil on hypercholesterolemia-induced alterations. Thus, this study investigated the effects of cold pressed chia seed oil supplementation on certain hematological and biochemical biomarkers in both normal and hypercholesterolemic rabbits. Thirty two male rabbits were assigned to four different groups and fed on: 1) a regular diet (CD), 2) CD supplemented with 10% chia oil, 3) CD supplemented with 1% cholesterol, 4) CD supplemented with 1% cholesterol and 10% chia oil. After six weeks of dietary interventions, mean arterial blood pressure and visceral fat were measured and blood samples were analyzed for lipid profiles and hematological parameters while erythrocyte membranes and retroperitoneal fat were analyzed for fatty acids composition and biochemical biomarkers. Dietary intervention with chia oil achieved control of the hypercholesterolemia-induced increase of mean arterial blood pressure, neutrophil to lymphocytes ratio, erythrocyte membrane fluidity, and improved erythrocyte morphological alterations. With regard to inflammatory biomarkers, chia oil supplementation reduced omega-6/omega-3 polyunsaturated fatty acids ratios and arachidonic/linolenic fatty acids ratios both in erythrocytes and fat from normal and hypercholesterolemic rabbits. The increase of linolenic fatty acid into the retroperitoneal fat was about 9 times higher than its respective controls. These results provide support for the potential health benefits of chia oil intake on hypercholesterolemia-associated clinical, hematological and biochemical alterations.

Keywords: Chia oil; Hematological alterations; Hypercholesterolemia; Linolenic acid; Rabbits; omega-6/omega-3 fatty acids ratio.

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