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Phytosterols effects over atherosclerotic lesion in mice with ablation of the LDL receptor gene

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The plasma cholesterol-reducing effect of phytosterols is well recognized and they are considered important adjuncts in the treatment of moderate hypercholesterolemia. However, studies have shown conflicting results regarding the efficiency of phytosterols in the prevention of atherosclerosis. In addition, studies showed that the increase in its plasma concentration is positively correlated to the risk of atherosclerosis. In order to elucidate its action on these parameters, the objective of this study was to evaluate the effects of phytosterol supplementation in the development of atherosclerosis in LDL receptor knock-out mice (LDLr -KO). The animals were fed during 16 weeks with high fat diet (40% of calories as fat), supplemented (PS group, 2%, n=10) or not (Control, n=10) with phytosterol. Plasma and liver concentrations of cholesterol, triglycerides, PS (β -sitosterol, campesterol and lathosterol) were evaluated. In the aorta of the animals, the concentrations of total cholesterol, free cholesterol, cholesterol ester and PS, besides macrophage and lipids infiltration were determined. The mRNA expression of genes involved in cholesterol efflux and influx (ABCA1, ABCG1, LOX1 and CD36) were evaluated, in peritoneum macrophage, which resemble those present in the artery. As expected, PS supplementation induced increasing plasma concentration of campesterol and β -sitosterol and reducing cholesterol plasma concentration. The content of total cholesterol in the artery was lower in PS group animals however did not differ between the free and ester forms. Artery PS concentrations did not differ between groups. The lesion area in the PS group was lower than in the control group. PS supplementation induced reduction in mRNA expression of ABCG1, not affecting the expression of other genes studied in artery. The findings of this study demonstrate that the elevation of plasma PS concentration did not induce its accumulation in the arterial wall and prevented the development of atherosclerosis.

Biography

Renata de Paula Assis Bombo has degree is Agriculture Engineering, although she was always involved with Food Technology and more recently with Nutrition and Atherosclerosis, which was her main focus in her doctorate program. She has completed her PhD from Faculty of Medical Sciences, University of Sao Paulo, Brazil and Master's degree at Faculty of Pharmaceuticals Sciences, University of São Paulo, where she developed her work at the Lipid Laboratory. She has 5 years of experience in basic research development involving animal models of dyslipidemia and also 5 years of experience with basic research in food science and technology. She has 5 papers published in well known research journals.

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