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Abstract

Effects of diatomaceous earth silica on postprandial hypertriglyceridemia and fat digestibility

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Abstract: Postprandial hyperlipidemia is an important risk factor for atherosclerosis and cardiovascular disease. Silicon (Si) intake has been shown to reduce postprandial hyperlipidemia. Diatomaceous earth (DE) is a highly concentrated source of silicon dioxide. Its use as a dietary Si supplement could have beneficial lipid-lowering effects. The objectives of this study were to investigate the antihyperlipidemic effect of DE on postprandial triglyceridemia and fat digestibility. Rats were daily administered for a week 1 ml of olive oil by oral gavage (C, control group) plus 4 mg Si/kg b.w./day of DE (DE group) (Vitality Gesf S.L). The area under the curve (AUC) of the oral triglyceride tolerance test (OTTT) was calculated. Gastric and intestinal fat content were extracted and composition were determined by HPSEC. A decrease in postprandial triglyceridemia was observed in DE group vs. C group, showing a lower plasma triglyceride AUC within the firsts 2.5 hours. DE rats showed higher amount of remaining fat in the stomach ($P<0.05$), without changes in its composition. DE increased the amount of fat remaining in the intestinal lumen ($P<0.05$), that presented higher levels of undigested triglycerides, leading to a decrease in lipid absorption. This study suggests that dietary DE supplementation could be a powerful tool in the treatment of postprandial hypertriglyceridemia by reducing fat digestion and absorption.

Keywords: Diatomaceous earth; silicon; supplementary food; postprandial hypertriglyceridemia; lipid-lowering therapy.

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