Dietary Carbohydrate Modifies the Inverse Association Between Saturated Fat Intake and Cholesterol on Very Low-Density Lipoproteins.

We aimed to investigate the relationship between dietary saturated fat on fasting triglyceride (TG) and cholesterol levels, and any mediation of this relationship by dietary carbohydrate intake. Men and women in the NHLBI Genetics of Lipid-Lowering Drugs and Diet Network (GOLDN) study (n = 1036, mean age ± SD = 49 ± 16 y) were included. Mixed linear models were run with saturated fat as a predictor variable and fasting TG, very low density lipoprotein cholesterol (VLDL-C), low density cholesterol (LDL-C) and high density cholesterol (HDL-C) as separate outcome variables. Subsequent models were run which included dietary carbohydrate as a predictor variable, and an interaction term between saturated fat and carbohydrate. All models controlled for age, sex, BMI, blood pressure and dietary covariates. In models that included only saturated fat as a predictor, saturated fat did not show significant associations with fasting lipids. When carbohydrate intake and an interaction term between carbohydrates and saturated fat intake was included, carbohydrate intake did not associate with lipids, but there was an inverse relationship between saturated fat intake and VLDL-C (P = 0.01) with a significant interaction (P = 0.01) between saturated fat and carbohydrate with regard to fasting VLDL-C concentrations. Similar results were observed for fasting TG levels. We conclude that, when controlling for carbohydrate intake, higher saturated fat was associated with lower VLDL-C and TGs. This was not the case at higher intakes of carbohydrate. This has important implications for dietary advice aimed at reducing TG and VLDL-C levels.