Carbohydrate-reduced diets and type 2 diabetes

Until now, studies of dietary effects on type 2 diabetes mellitus (T2DM) have mostly mixed diet, body weight loss and exercise when evaluating the antidiabetic dietary effects on metabolism. In the present three studies, we will evaluate the acute and the long-term effects of a carbohydrate-reduced/high-protein diet on glucose metabolism and cardiovascular risk markers, and in addition evaluate to what extent a body weight loss will further improve the metabolic changes induced by this diet.

The phenotype study (the first study) evaluated the acute effects of a carbohydrate-reduced/high-protein diet and showed that this diet improved the glucose metabolism, e.g. reductions of diurnal glucose levels of 10%, postprandial glucose area (AUC) of 14%, and insulin secretion levels of 22%, when compared to a diet high in carbohydrates/low in proteins.

The iso-energetic study (the second study) elucidated the long-term effects of carbohydrate-reduced/high-protein diet and showed that the beneficial effects persisted during six weeks of full meal provision while maintaining a constant body weight and level of physical activity.

Finally, the hypo-energetic study (the third study) will evaluate the effect of a carbohydrate-reduced/high-protein diet under caloric restriction and a controlled weight loss.

Through comparison of these studies the effect of a carbohydrate-reduced/high-protein diet as a modality in T2DM treatment is being explored. As body weight loss has proven very difficult to obtain for individuals with T2DM, we hypothesize that dietary macronutrient composition with lower carbohydrate and higher protein and fat content will be successful in treating and possibly preventing T2DM both with or without a weight loss.