NAPCRG 52nd Annual Meeting — Abstracts of Completed Research 2024.

Submission Id: 5915

Title

Acute changes in insulin requirements in response to plant-based dietary interventions.

Priority 1 (Research Category)

Diabetes and endocrine disease

Presenters

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Abstract

Context: Plant-based diets comprise a spectrum of plant-predominant dietary patterns which have often been associated with significant cardiometabolic benefits. Because of their health benefits, providers sometimes recommend, and motivated patients sometimes adopt, a plant-based diet to improve their health. Among adults with insulin-treated type 2 diabetes, however, there is limited research regarding acute insulin dosing changes following dietary adoption of plant-based diets, which makes it difficult to provide anticipatory guidance and may lead to hypoglycemia if insulin reductions are not properly anticipated. To address this knowledge deficit, we conducted a nonrandomized crossover trial utilizing two plant-based diets (Dietary Approaches to Stop Hypertension, or DASH, and Whole Food, Plant-Based, or WFPB) among individuals with insulin-treated type 2 diabetes. Objective: Describe acute changes in insulin requirements among adults with insulin-treated type 2 diabetes in response to DASH and WFPB diets. Study Design and Analysis: Nonrandomized crossover intervention trial, analyzed using linear mixed effects models. Intervention: Participants (n=15) enrolled in a 4-week trial with sequential, one-week phases: Baseline, DASH 1, WFPB, and DASH 2. Each diet was ad libitum and meals were provided. Outcome Measures: A continuous glucose monitor was used throughout all phases and laboratory testing, including a 2-hour glucose tolerance test, was administered at the end of each phase. Outcomes included insulin usage, weight, blood pressure, blood glucose, insulin, C-peptide, insulin resistance (HOMA-IR), insulin sensitivity index, cholesterol, adiponectin, leptin, urinary glucose. Results: Compared to baseline, daily insulin usage was 24%, 39%, and 30% lower after DASH 1, WFPB, and DASH 2 weeks respectively (all $p < 0.01$). Insulin resistance (HOMA-IR) was 49% lower ($p < 0.01$) and the insulin sensitivity index was 38% higher ($p < 0.01$) at the end of the WFPB week before regressing toward baseline during DASH 2. Total, LDL, and HDL cholesterol, leptin, urinary glucose, and hsCRP decreased to a nadir at the end of the WFPB week before increasing during DASH 2. Conclusions: Adopting a DASH or

WFPB diet can result in significant, rapid changes in insulin requirements, insulin sensitivity, and related markers among individuals with insulin-treated type 2 diabetes, with larger dietary changes producing larger benefits.