Glycemic profile is improved by High Slowly Digestible Starch diet in type 2 diabetic patients

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Abstract

Introduction

Considering the dramatically increasing incidence of type 2 diabetes (T2D), decreasing glycemic variability in T2D patients is a key challenge to limit the occurrence of diabetic complications. Diet appears as one potential lever that can be set up above medications. Particularly, the ingestion of foods with a high content in slowly digestible starch (SDS) demonstrated both lower postprandial glycemic and insulin responses in healthy and insulin resistant subjects. This study aimed at designing a full high-SDS diet by selecting high-SDS starchy food products and at studying its impact on glycemic response and variability in T2D.

Materials and methods

This pilot randomized controlled cross-over study included eight T2D patients (HbA1c = $7.0 \pm 0.2\%$, BMI = 31.7 ± 2.1 kg/m^2, treated by Metformin & Sitagliptin) who consumed twice, for one week a controlled diet containing starchy food products screened and selected to be either High (High-SDS) or Low (Low-SDS) in SDS, as determined by the SDS *in-vitro* method developed by Englyst et al. During each diet period, the glycemic profile was monitored for 6 days using a Continuous Glucose Monitoring System (CGMS). Multiple metrics related to variability and glycemic responses were calculated.

Results

222 SDS analyses were realized on commercial food products as consumed. 23 High-SDS and 20 Low-SDS food items with associated specific cooking instructions were selected to design two diets consistent with local T2D recommendations. The High-SDS diet demonstrated a significantly higher SDS content compared to the Low-SDS diet (61.6 vs 11.6 g/day; p < 0.0001), mainly driven by selected pasta, rice and high-SDS biscuits (75.6% of the consumed SDS content). The % of total daily energy intake (TDEI) for all macronutrients remained similar between diets (p > 0.05) and the carbohydrate content specifically represented 49 ± 1 % and 47 ± 2 % of the TDEI for High-SDS and Low-SDS diets, respectively. With the high-SDS diet, the Mean Amplitude of Glycemic Excursion, a key parameter of glycemic variability, was significantly decreased (79.6 for Low-SDS vs 61.6 mg/dL for High-SDS; p = 0.0067). The significant correlation between the meals SDS contents and various glycemic parameters such as postprandial iAUC, tAUC (up to 180 min) or peak value strengthen this finding (p < 0.05 for all).

Discussion

It was the first demonstration that a diet including selected starchy food items and cooking recommendations designed to favor products' high SDS content beneficially impacts glycemic profile in T2D subjects. Carefully selecting starchy food may be a simple and valuable tool to improve glycemic control in T2D.