

Use of a Continuous Glucose Monitor to Determine the Glycaemic Index of Rice-Based Mixed Meals, Their Effect on a 24 h Glucose Profile and Its Influence on Overweight and Obese Young Adults' Meal Preferences

ABSTRACT

Postprandial hyperglycaemia is associated with an increased risk of type-2 diabetes. This study aims to determine the glycaemic index (GI) of three varieties of rice-based mixed meals and their effects on glycaemic variability (GV), 24 h mean glucose levels and target ranges, and rice variety preferences among overweight and obese young adults using real-time continuous glucose monitoring (rtCGM). In a randomised controlled crossover design, 14 participants (22.8 ± 4.6 years, 32.9 ± 5.8 kg/m²) were randomly assigned to receive 3 rice-based mixed meals containing 50 g of available carbohydrates (white rice meal = WRM; brown rice meal = BRM; and parboiled basmati rice meal = PBRM) and 50 g of a glucose reference drink on alternate days. GI, GV, 24 h mean glucose levels and target ranges were measured. Rice variety preferences were compared with those of baseline data and determined at the end of the study period. Results: The analysis found that PBRM was low in GI (45.35 ± 2.06), BRM medium in GI (56.44 ± 2.34), and WRM high in GI (83.03 ± 2.19). PBRM had a significantly ($p < 0.05$) lower 24 h mean glucose level, higher in-target 24 h glucose level percentage and non-significantly ($p > 0.05$) lower GV compared to WRM. Prior to observing their postprandial glucose levels generated by rtCGM, the participants preferred WRM (64.3%) over other meals, whereas this preference changed significantly ($p < 0.05$) at the endpoint (PBRM, 71.4%). PBRM reduced 24 h glucose level and GV of overweight and obese young adults. The rtCGM is proven to be reliable in measuring GI, while providing robust continuous glycaemic information. This may serve as an educational tool that motivates eating behaviour changes among overweight and obese young adults.