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LETTER TO THE EDITOR

The Continuous Glucose Monitoring System Is Effective in Determining Major Factors Affecting Postprandial Glycemic Patterns in People with Type 2 Diabetes

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We report a study intended to determine the time and magnitude of maximal postprandial glycemia in a cohort of subjects with type 2 diabetes. In an attempt to prevent the complications of type 2 diabetes, particular attention should be paid to controlling postprandial glycemia; the postprandial glucose peak induces oxidative stress and endothelial dysfunction, the first step toward accelerated atherogenesis.[1] The contribution of postprandial glucose is predominant in patients with satisfactory control of diabetes, whereas the contribution of fasting glucose increases progressively with worsening diabetes.[2] This is why postprandial hyperglycemia is often not recognized in patients with satisfactory levels of hemoglobin A1c (HbA1c). Furthermore, the type and composition of the meal affects the postprandial glycemic pattern. Thus, the peak of postprandial hyperglycemia is often overlooked. Continuous glucose monitoring was previously shown to be effective in detecting postprandial hyperglycemia in both type 1 and type 2 diabetics[3,4] and to be helpful in determining food recommendations for diabetics.[5]

The aim of this study was to determine the main dietary factors influencing postprandial glycemia in typical type 2 diabetics, with the usage of a continuous glucose monitoring system CGMS® Systems Gold (Medtronic MiniMed, Northridge, CA), and to determine postprandial glycemic patterns following ingestion of meals of different composition. Eight, obese individuals (BMI 31–34 kg/m^2) with type 2 diabetes, all treated with metformin, with good metabolic control, (HbA1c <6.5%) underwent 72-hour continuous glucose monitoring. The clinical characteristics of the patients are summarized in **Table 1**. Before the CGMS recordings, patients were encouraged to not alter their usual pattern of food intake during recording periods. They were instructed to use food diaries. The blood for HbA1c testing was obtained and the number of hyperglycemic events (BG >140 mg/dl) was determined. An event was defined as a glucose value that persisted for at least 15 minutes.

Table 1.
The Clinical Characteristics of Study Participants

Age	48–58 years
Sex	5 M, 3 F
Diabetes duration	1–3 years (mean 1.8 years)
HbA1c	6.2–6.4% (mean 6.32%)
BMI	31–34 kg/m^2

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Abbreviations: (HbA1c) hemoglobin A1c, (BMI) body mass index, (BG) blood glucose

Keywords: diabetes, postprandial glycemia, continuous glucose monitoring, CGMS

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High postprandial glucose values (>140 mg/dl, 0.5–4 h postprandial) were recorded after 38% of all meals. All episodes appeared after the meals rich in carbohydrates (carbohydrates >70% of calories) and rich in products with a high glycemic index (GI >70). The peak of glycemia appeared approximately 1 hour after ingestion of carbohydrate-rich meals, and approximately 3–4 hours after ingestion of protein/fat rich meals.

In conclusion, postprandial glycemic excursions are relatively common in well-controlled, obese patients with type 2 diabetes who are treated with metformin. Glycemic load is one of the main factors affecting postprandial glycemia. The CGMS is effective in detecting postprandial hyperglycemia and determining the postprandial glycemia profiles following ingestion of meals of different composition, and thus may be helpful in establishing the dietary recommendations for people with diabetes.

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