

Influence of Oral Antidiabetic Drugs on Hyperglycemic Response to Foods in Persons with Type 2 Diabetes Mellitus as Assessed by Continuous Glucose Monitoring System: A Pilot Study

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Abstract

Background:

The purpose of this prospective open-label trial was (1) to assess the influence of oral antidiabetic drugs (OAD) on the glycemic index (GI), glucose response curves (GRCs), daily mean plasma glucose (MPG) and (2) to compare the GI of foods in persons with OAD-treated type 2 diabetes mellitus (T2DM) with the respective GI in healthy persons (HP).

Methods:

Tested foods containing 50 g of carbohydrates were eaten for breakfast and dinner after 10 and 4 h of fasting, respectively. Glycemic index, GRC, and MPG were obtained using the CGMS[®] System Gold[™] (CGMS). In T2DM patients [$n = 16$; age (mean \pm standard error) 56.0 ± 2.25 years], foods were tested four times: tests 1, 2, and 3 were performed within one week in which placebo was introduced on day 2, and test 4 was carried out five weeks after reintroduction of OAD. Glycemic indexes, GRC, and MPG from tests 1, 2, 3, and 4 were compared. In a control group of 20 HP (age 24.4 ± 0.71 years), the mean GIs were calculated as the mean from 20 subject-related GIs.

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Abbreviations: (CGMS) CGMS[®] System Gold[™] continuous glucose monitoring system, (DCCT) Diabetes Control and Complications Trial, (GI) glycemic index, (GRC) glucose response curve, (HbA1c) hemoglobin A1c, (HP) healthy persons, (IAUC) incremental area under the curve, (IFCC) International Federation of Clinical Chemistry, (MPG) mean plasma glucose, (OAD) oral antidiabetic drugs, (T2DM) type 2 diabetes mellitus, (WHO) World Health Organization

Keywords: continuous glucose monitoring system, glycemic index of foods, glycemic response curve, incremental area under the curve, oral antidiabetic drugs, type 2 diabetes mellitus

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Abstract cont.

Results:

In T2DM patients, subject-related assessment of GIs, GRC, and MPG distinguished persons with and without OAD effect. Nevertheless, the group-related GIs and the MPG on days 2, 8, and 39 showed no significant difference. There was no significant difference between the GIs in OAD-treated T2DM patients (test 4) versus HP (except in apple baby food). Glucose response curves were significantly larger in T2DM patients (test 4) versus HP.

Conclusions:

Determination of GRC and subject-related GI using the CGMS appears to be a potential means for the evaluation of efficacy of OAD treatment. Further studies are underway.

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