ABSTRACT

Glucose And Insulin Responses To
Different Carbohydrate-Based Foods Commonly
Eaten By Patients With Type 2 Diabetes In Trinidad.

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Objectives: The objectives of the present study were (i) to identify the 3 most
commonly consumed carbohydrate-based foods among type 2 diabetic patients
visiting 2 primary care clinics (Arima and Chaguanas Lifestyle Disease Clinics),
(ii) to determine the glucose and insulin responses to these chosen foods, (iii) to
assess the differences in postprandial glucose management in the 2 clinics, and
(iv) to determine which of the 3 test foods has the highest propensity to induce
postprandial hypertriglyceridaemia. Methods: Type 2 diabetic patients were
interviewed using a 24-hour food frequency recall (FFR) questionnaire during 2
seasons of the year to determine the frequently consumed foods. Information
regarding all meal components eaten during breakfast, lunch and dinner of the
preceding 24 hours was collected. Subsequently, 38 type 2 diabetic patients
visiting 2 clinics and 27 non-diabetic subjects were studied on 3 different
occasions of 7 days apart after an overnight fast. On each day of study,
anthropometric indices were measured and after collecting fasting blood sample,
subjects randomly consumed the predetermined test foods (bread, roti or rice)
within 10 minutes of taking the blood samples. Then, 5ml of venous blood
samples were collected at 60, 90, 120 and 150 minutes for insulin, glucose, total
cholesterol, triglycerides, HDL- and LDL-cholesterol and HbA1c determinations.

Results: The food frequency survey showed that bread, rice and roti were the
most commonly consumed carbohydrate foods. Of these 3 foods, bread had the
highest consumption frequency (38%). Expectedly, fasting and postprandial
glucose concentrations for the 3 test foods were higher in diabetic patients than
for the non-diabetic subjects (all; p < 0.01). Of all the test foods, roti elicited the
highest incremental glucose responses in the diabetic patients irrespective of
ethnic group or gender (p < 0.01). The 2.5-hour glucose levels for the diabetic
patients visiting either of the 2 clinics exceeded the internationally recommended
cut-off value (< 7.8 mmol/L) but was worse in patients visiting Chaguanas clinic.
Incremental triglyceride after ingestion of the test foods was highest with bread
and lowest with rice irrespective of diabetes status or ethnicity (p < 0.05).

**Conclusions:** There were variations in glucose and insulin responses to these test
foods, however, roti elicited the highest postprandial hyperglycaemia and should
therefore be discouraged in frequent dietary plan of diabetic patients. The present
data suggests that commercially prepared whole-wheat brown bread eaten with
cheese has the highest potential of inducing postprandial hypertriglyceridemia.
However, emphasis should be placed on controlling postprandial glucose based
on international standards while more aggressive diabetes dietary education
should be reinforced at the clinics especially Chaguanas.

**Keywords:** type 2 diabetes, dietary carbohydrate, postprandial glucose, and
hypertriglyceridaemia