Assessment of Plasma Glucagon-like Peptide-1 levels among Nigerians with Newly Diagnosed Type 2 Diabetes Mellitus.

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BACKGROUND:

Type 2 diabetes mellitus (T2DM) is on the rise in Sub-Saharan Africa – a worrying trend fuelled by rapid urbanization, unhealthy lifestyle, physical inactivity and the growing epidemic of overweight and obesity.

An incretin hormone called glucagon-like peptide-1 (GLP-1) controls glucose homeostasis by increasing insulin secretion and glucose uptake. This complements the metabolic effects of insulin.

It is established that persons with T2DM have a substantial incretin defect thus contributing to the occurrence of sustained hyperglycaemia in T2DM. There are no published studies on the relative contribution of incretin defects (GLP-1 deficiency) to the growing burden of T2DM in Nigeria, hence the justification for this work.

OBJECTIVES:

We assessed the plasma GLP-1 levels in patients with T2DM and compared the levels with those in apparently healthy controls.

METHODS:

In a cross-sectional study of 100 newly diagnosed T2DM patients accessing care at the Aminu Kano Teaching Hospital, Kano Nigeria, we determined the mean fasting plasma GLP-1 levels as well as the fasting plasma glucose, 2-hour post-prandial glucose and 2-hour post-test meal GLP-1 after baseline anthropometric measurements. Similar assessments were carried out for 100 age and gender matched apparently healthy individuals who served as study controls. The 2 hour post-test meal levels of GLP-1 were measured following equimolar calorie food (560kcal) ingestion. A P-value of < 0.05 was considered as statistically significant.

RESULTS:

The mean age for the study subjects was 44.6±6.1 years (56.0% females and 44.0% males) compared with 44.8±4.3 years in the control group (54.0% females and 46.0% males). The mean BMI, SBP, DBP, FPG, 2hrPP and HbA1c of the study subjects compared to controls were 31.3±5.5kg/m2, 132.73±19.55mmHg, 82.32±11.86mmHg, 252.31±81.39mg/dl, 356.84±91.89mg/dl, 8.6% and 27.6±5.2kg/m2 , 121.24±15.33mmHg, 76.84±13.99mmHg, 88.38±6.43mg/dl, 128.74±11.33mg/dl, 4.8% respectively, $p<0.05$.

The mean value of fasting GLP-1 and 2 hour posttest meal GLP-1 in newly diagnosed T2DM patients were lower than those of the controls 6.34±4.03 vs 9.68±5.01 pmol/l and 12.19±7.73 vs 16.28±6.39 pmol/l, respectively $P< 0.001$.

DISCUSSION:

Our findings were consistent with previous studies which corroborates that persons with T2DM are incretin deficient.

CONCLUSION:

Nigerians with type 2 DM are significantly more incretin (GLP-1) deficient compared with apparently healthy individuals. The postprandial effects on GLP-1 are also remarkably impaired in Nigerians with T2DM. These observations may provide helpful information with regards to the therapeutics of T2DM in Nigerians. A larger multi centre randomized trial may provide more insights.

Key words: Type 2 Diabetes Mellitus, Glucagon-Like Peptide-1, Nigerians, healthy controls.

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