High Glucagon-to-C-peptide Ratio and Inadequate Glucose Control in Type 2 Diabetic Patients

Chunfeng Lu (✉ lcf0413cwl1030@126.com)

Department of Endocrinology, Affiliated Hospital 2 of Nantong University and First People's Hospital of Nantong City, No. 6 North Hai-er-xiang Road, Nantong 226001, China

Jianbin Su

Nantong City No 1 People's Hospital and Second Affiliated Hospital of Nantong University

Xueqin Wang

Nantong City No 1 People's Hospital and Second Affiliated Hospital of Nantong University

Xiaoqin Ge

Nantong City No 1 People's Hospital and Second Affiliated Hospital of Nantong University

Wangshu Liu

Nantong City No 1 People's Hospital and Second Affiliated Hospital of Nantong University

Feng Xu

Nantong City No 1 People's Hospital and Second Affiliated Hospital of Nantong University

Dongmei Zhang

Nantong City No 1 People's Hospital and Second Affiliated Hospital of Nantong University

Research

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Abstract

Objective: Unbalanced glucagon and insulin secretion may contribute to glucose fluctuations and inadequate glucose control in type 2 diabetic patients. This study aimed to investigate the relationship between the glucagon-to-C-peptide ratio and glycemic control.

Methods: From January 2017 to December 2018, a total of 1128 type 2 diabetic patients were recruited. The fasting and postprandial glucagon-to-C-peptide ratios were calculated following a 75-g oral glucose tolerance test (OGTT). Subjects were divided into quartiles based on their fasting and postprandial glucagon-to-C-peptide ratios. Statistical analysis was then carried out.

Results: HbA1c levels were significantly and positively correlated with fasting ($r = 0.333$, $p < 0.001$) and postprandial glucagon-C-peptide-ratio ($r = 0.373$, $p < 0.001$). The proportion of patients with uncontrolled hyperglucose significantly increased from 76.2% to 83.0%, 89.4% and 94.7% from the first to second, third and fourth quartiles of the fasting glucagon-C-peptide ratio and increased from 73.4% to 80.9%, 93.3% and 95.7% from the first to second, third and fourth quartiles of the postprandial glucagon-C-peptide ratio, respectively. After adjusting for potential influences, the mean difference (95% CI) in HbA1c between the patients in the lowest and highest quartiles of the fasting glucagon-C-peptide ratio was 1.925 (1.512, 2.338) %, and the mean difference in HbA1c between the patients in the lowest and

highest quartiles of the prandial glucagon-C-peptide ratio was 2.401 (1.981, 2.820) %. After adjusting for possible metabolic risks by multiple logistic regression analysis, the corresponding odds ratios (ORs) for uncontrolled hyperglucose of the second, third and fourth quartiles versus the first quartile of fasting glucagon-C-peptide-ratio

were 1.331 (95% CI 0.829–2.136), 2.818 (1.647–4.823) and 7.268 (3.573–14.784), respectively. When compared with the first quartile of the postprandial glucagon-C-peptide ratio, the corresponding ORs for uncontrolled hyperglucose of the second, third and fourth quartiles were 1.752 (95% CI 1.100–2.793), 6.304 (3.348–11.560) and 15.998 (7.353–34.805), respectively.

Conclusions: For type 2 diabetic patients, an increased glucagon-to-C-peptide ratio is associated with an increased risk of uncontrolled hyperglucose.

Full Text

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Tables

Due to technical limitations, table 1-5 is only available as a download in the Supplemental Files section.

Supplementary Files

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