Key Summary of Conference Abstract

Serum Insulin and C-Peptide Levels Predict Insulin Resistance in Apparently Healthy Individuals

Background

- Insulin resistance (IR) is associated with risk of type 2 diabetes, as well as cardiovascular and metabolic diseases.[1] It is defined as decreased responsiveness of tissues to insulin and is currently measured indirectly using a variety of surrogate biomarkers.[1,2]
- Previously, Quest Diagnostics developed a high-throughput mass spectrometry (MS) assay for measuring intact insulin and C-peptide. The assay provides a standardized measurement that may be helpful to quantitatively assess IR.[3]
- **Objective:** The investigators examined whether plasma insulin and C-peptide concentrations accurately reflect IR in a multiethnic cohort of apparently healthy individuals with, and without, metabolic syndrome.

Methods

- In this retrospective study, the following data were available for 535 participants: age, sex, ethnicity, systolic blood pressure, body mass index (BMI), fasting plasma glucose, high-density lipoprotein cholesterol (HDL-C), triglycerides, creatinine, and alanine aminotransferase.
- A subset of these measures was used to define the presence of metabolic syndrome.
- Steady-state plasma glucose (SSPG) concentration, a direct measure of IR, was assessed by insulin suppression test. Those in the top tertile of SSPG were defined as having IR.
- Plasma concentrations of insulin and C-peptide were determined using the MS assay developed and validated at Quest Diagnostics.[3] Other biomarkers were determined using standard methods.
- Differences in traditional risk factors between participants with IR and those without IR were assessed by the Wilcoxon-rank sum test and by chi-square tests.
- The association of serum insulin and C-peptide level with IR was evaluated by logistic regression models while controlling for patient characteristics and biochemical measurements.

Results

- Insulin and C-peptide levels were associated with IR in individuals with metabolic syndrome as well as those without.
- Individuals in the top quartile of either insulin or C-peptide levels had a greater risk of IR than those not in the top quartile. This was true whether or not they had metabolic syndrome.

Conclusions

- In a multiethnic population of apparently healthy individuals, fasting insulin and C-peptide levels were each associated with IR, with or without the presence of metabolic syndrome.
- These data suggest that a risk score combining C-peptide and insulin levels could be used to predict an individual's probability of having IR.

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