

Serum Insulin and C-Peptide Levels Identify Insulin Resistance in Apparently Healthy Non-Hispanic Whites

Background

- Insulin resistance (IR) is a precursor to cardiovascular and metabolic diseases.¹ It is defined as decreased sensitivity and responsiveness to insulin and is currently measured indirectly using a variety of surrogate biomarkers.^{1,2}
- Previously, Quest Diagnostics developed a high-throughput mass spectrometry assay for measuring intact insulin and C-peptide. The assay provides a standardized measurement that may be helpful to quantitatively assess IR.³
- **Objective:** In a retrospective study, the investigators examined whether plasma insulin and C-peptide concentrations accurately reflect IR in a population of apparently healthy non-Hispanic white adults.

Methods

- A total of 278 non-Hispanic white adults had data available for all anthropometric measurements and biomarkers: age, sex, systolic blood pressure (SBP), body mass index (BMI), fasting plasma glucose (FPG), high-density lipoprotein cholesterol (HDL-C), triglycerides, creatinine, and alanine aminotransferase (ALT).
- Steady-state plasma glucose (SSPG) concentration, an indicator of IR, was measured by means of a fasting insulin suppression test. The top quartile of SSPG concentrations was used to define IR.
- Plasma concentrations of insulin and C-peptide were determined using the high-throughput mass spectrometry assay developed and validated at Quest Diagnostics.³ Other biomarkers were determined using standard methods.
- The association between each variable and insulin resistance was assessed using a logistic regression model. To assess the ability of models to distinguish IR, area under the receiver operating characteristics curves (AUROCs) were calculated.

Results

- After adjusting for age and sex, the following were associated with high SSPG concentrations: insulin, C-peptide, FPG, HDL-C, BMI, creatinine, ALT, and SBP.
- In a model containing only insulin, C-peptide, and BMI, the AUROC was 0.90; removing BMI from the model (ie restricting the model to the biomarkers insulin and C-peptide) decreased the AUROC only marginally, to 0.89.

Conclusions

- Fasting insulin and C-peptide levels accurately reflect IR in apparently healthy non-Hispanic whites individuals.

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