Insulin Resistance Probability Scores for Apparently Healthy Individuals

Background

- Insulin resistance (IR) is decreased cellular response to insulin that typically precedes the onset of dysglycemia and type 2 diabetes (T2DM).[1]
- Detection of IR in apparently healthy individuals may provide time for T2DM prevention strategies, such as lifestyle and/or pharmaceutical interventions.
- However, direct measurement of IR involves intravenous infusion and repeated blood sampling over 2 to 4 hours making it impractical in clinical settings.
- **Objectives:** The investigators of this study developed an IR score based on biochemical markers that can be used in the clinic to assess IR in apparently healthy individuals.

Methods

- **Population:** Study participants included 535 apparently healthy individuals recruited from the San Francisco Bay Area between 1999 and 2011.
- **IR measurement:** IR was used as the reference standard. It was assessed using steady-state plasma glucose (SSPG) concentration measured during an insulin suppression test. Those in the top tertile of SSPG (SSPG ≥198 mg/dL) were considered insulin resistant.
- **Measurement of markers:** Most biochemical markers were measured using standard methods. Insulin and C-peptide levels were measured with a mass-based assay developed and validated at Quest Diagnostics.[2]
- **Association of individual factors:** Logistic regression models were used to evaluate associations of IR with anthropometric characteristics and clinical measurements (eg, biochemical markers, body mass index, blood pressure).
- **Probability score calculation:** IR probability scores were calculated based on the model factors that were significantly associated with IR. The association of the score with IR was then evaluated using logistic regression models.

Results

- Insulin, C-peptide, creatinine, BMI, and the triglyceride-to-HDL-C ratio were independently associated with IR ($P<0.05$); thus, they were used to construct IR probability scores.
- Individuals with IR probability scores >66% had 26.7 (95% CI 14.0 to 50.8; $p<0.001$) greater odds of having IR than individuals with scores <33%.
- When only levels of insulin and C-peptide were used to calculate the IR probability score, the odds for having IR were 15.6 times greater (95%CI 7.5 to 32.4; $p<0.001$) for individuals with scores >66% relative to those with scores <33%.

Conclusions

- The IR probability score developed in this study can help assess the probability of IR in apparently healthy individuals. Notably, the score was useful when only insulin and C-peptide were used.
- The score may help identify individuals who would benefit from T2DM prevention strategies.

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References
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