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Editorial

Surrogates Markers of Insulin Resistance

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Insulin resistance (IR) is a fundamental feature of obesity, diabetes, and cardiovascular diseases and contributes to many of the metabolic syndrome's abnormalities. It is defined as a subnormal reaction to normal insulin concentrations or a situation where greater than normal insulin concentrations are necessary for a normal response. Turner RC et al. discovered that insulin resistance was linked to diabetes mellitus as early as 1979. They discovered that the severity of hyperglycemia in diabetes corresponded to the severity of insulin resistance (1).

Identifying patients with IR is critical for developing therapies and prevention measures for Insulin resistance-related chronic disorders, including obesity and type 2 diabetes, which are extremely common. Early detection of IR is critical for predicting the onset of cardiovascular disease, fatty liver disease, and metabolic illnesses (2).

Insulin resistance can be evaluated in a variety of ways. The standard gold test is the hyperinsulinemic-euglycemic clamp (HIEC). Still, it is difficult and time-consuming and necessitates insulin infusion and periodic blood samples, limiting its clinical screening uses. The homeostasis model for IR (HOMA-IR) was developed in 1985 and is widely used to estimate IR. It uses fasting blood glucose levels and insulin concentration as variables. The lack of a standard test for measuring fasting insulin levels makes it difficult to compare absolute results of plasma insulin concentrations between laboratories (3).

The development of novel surrogate indicators of insulin resistance that are more relevant for clinical screening and large population-based studies is urgently needed. As a result, a variety of surrogate indices have been used to make the determination of insulin resistance easier and more accurate. Triglyceride and glucose index (TyG index), Lipid accumulation product (LAP), Visceral adiposity Index (VAI), among others, are examples of novel surrogate markers of insulin resistance (4-7).

The TyG index has been linked to diabetes, hypertension, nonalcoholic fatty liver disease, and cardiovascular events. It is a non-insulin-based marker derived mathematically from a single determination of fasting blood glucose and triglycerides. Glucotoxicity and lipotoxicity have been shown to be important contributors in IR modulation. Because of its connection to lipotoxicity and glucotoxicity, the triglyceride-glucose (TyG) index has been proposed as an alternative measure of IR. TyG index showed a good correlation with the standard gold method of IR determination. Both

glucose and lipid levels are routinely checked in almost every care setting and are less expensive than insulin-based indicators (4,5).

The LAP, is a model based on fasting Triglyceride level and waist circumference, it is a promising marker of central lipid accumulation and insulin resistance. And a reliable and independent predictor of all-cause and cardiovascular mortality, as well as metabolic syndrome, type 2 diabetes, and cardiovascular disease. (6).

Visceral Adiposity Index (VAI) is a model calculated by both anthropometric parameters (body mass index and waist circumference) and laboratory parameters (triglycerides and high-density lipoprotein cholesterol). It is a simple marker of adipose tissue dysfunction that can be used to predict cardiometabolic risk before it manifests as metabolic syndrome and/or cardiovascular problems. The VAI is inversely associated to adiponectin levels, insulin sensitivity, and insulin secretion, as well as being separately linked to GH levels. The VAI has been considered a marker of Cardiometabolic risk, altered adipose function, insulin resistance, non-alcoholic fatty liver diseases, and non-alcoholic steatohepatitis (7,8).

The clinical usefulness of new lipid indices in detecting IR in the general population is supported by many researches (9). Lipid indices can be effective markers of IR risk assessments in clinical settings since they can be easily determined with normal laboratory procedures. These surrogate markers for assessing insulin resistance could thus help to maximize the utilization of medicinal resources while reducing expenses and undesirable side effects (10).

Because these markers may be easily measured using standard laboratory protocols, they might be useful markers for IR risk evaluations in clinical settings. These surrogate markers may thus help to maximize the use of medical resources while lowering costs and negative effects.

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