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The LS-IM score and its relation to direct measurements of insulin resistance

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Abstract

Insulin Resistance (IR) increases risk of diabetes and cardiovascular disease and has hallmarks of hyperinsulinemia and lipoprotein abnormalities. We have shown that clinical assessment of IR can be performed by the IR risk score (IRRS) calculated from fasting insulin and C-peptide and by a score based on ion mobility lipoprotein subfractions (LS-IM), where high scores are associated with IR in the top tertile of steady-state plasma glucose (SSPG) measured during the insulin suppression test (IST). However, some individuals in the top SSPG tertile exhibit lower level of IR by the IRRS. It is not known whether these individuals have a high LS-IM score, which would correctly classify them as being insulin resistant. We, therefore, examined the relationship of IRRS and LS-IM score in 526 healthy individuals without diabetes who had undergone direct measurement of IR by the IST. Of the 325 individuals with low IRRS, 50%, 37% and 13% were in the bottom, middle, and top SSPG tertiles, respectively. Individuals with low IRRS in the top SSPG tertile had LS-IM scores 18.9 units higher than those in the bottom SSPG tertile (a 1 SD difference in means; $P<0.0001$; adjusted for sex, race, ethnicity, BMI, and TG/HDL-C). The lower IRRS in IR individuals might reflect lower secretion or higher clearance of insulin and C-peptide and that the LS-IM score may not be similarly affected. Thus, LS-IM score can serve as a marker of IR that complements the measures of IR by the IRRS.