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Comparison of Glucose and Insulin Profile Between Normal and Prediabetic Subjects
Abstract:

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Abstract
Background: Assessment of glucose and insulin resistance by oral glucose tolerance test is commonly used to screen asymptomatic adults interested in risk assessment for metabolic disorders. In general, absolute values at various intervals are used as the cutoff for normal vs. abnormal. However, the pattern of glucose or insulin rise and fall profile (shape) has been sparsely studied. We assessed the glucose and insulin peak profile in normal and in prediabetics.

Method: We performed a cross-sectional analysis of 46 consecutive asymptomatic subjects without chronic illness (M: F 18:28, age 52±11 yrs.) who underwent clinical assessment including serial glucose and insulin measurement (baseline [fasting], 30-, 60-, and 90-minute post-oral 75-gram glucose loading).

Results: 34 subjects had normal fasting glucose (<100 mg/dL), 12 were prediabetic (≥100, <126 mg/dL), and no one was diabetic (>126 mg/dL). The maximum rise in glucose and insulin levels was at either 30-min or 60-min. The average Insulin level rise was higher (98±105 vs. 46±49 uIU/ml, p=0.04) but peaked later (at 60-min compared to 30-min) in prediabetics than in normal. Individually, more prediabetics had discordant timing of insulin rise (i.e., max insulin time differed from max glucose time) than normal (54% vs. 32%, p = 0.03). All subjects had monophasic rise and fall patterns, and no one had a biphasic pattern (initial rise, then fall, and then rise again).

Conclusions: Insulin profile (shape) in prediabetics differs significantly from normal subjects. Further study is needed to validate and understand this relationship's basis and clinical utility.