

High 1-hour Plasma Glucose: Early Indicator of Type 2 Diabetes Risk

SANJAY KALRA

Sanjay Kalra, Dept. of Endocrinology, Bharti Hospital, Karnal, Haryana, India; University Center for Research & Development, Chandigarh University, Mohali, Punjab, India

High 1-hour postprandial plasma glucose levels (≥ 155 mg/dL) with normal glucose tolerance (NGT) increase the risk of type 2 diabetes, according to a Korean study published in the journal *Diabetes Research and Clinical Practice*.¹ High 1h-PG had a shorter progression time to type 2 diabetes vs low 1h-PG.

Through this study, the researchers aimed to evaluate the risk of type 2 diabetes on the basis of one-hour post-load plasma glucose (1h-PG) levels and to assess changes in insulin sensitivity and β -cell function across different 1h-PG categories in a cohort of 6144 participants. Participants were categorized at baseline into three groups: Low 1h-PG (< 155 mg/dL) with normal glucose tolerance (NGT), High 1h-PG (≥ 155 mg/dL) with NGT, and prediabetes (PreDM). Oral glucose tolerance tests (OGTTs) were performed every two years as part of the 10-year longitudinal Korean Genome Epidemiology Study.

The risk of type 2 diabetes was higher in individuals with high 1h-PG and normal glucose tolerance (NGT) and those with prediabetes (PreDM) compared to those with low 1h-PG and NGT. At baseline, insulin sensitivity, measured using the insulin sensitivity and secretion (ISS) model and the Matsuda insulin sensitivity index (ISI), was highest in the Low 1h-PG group, while the high 1h-PG group showed levels comparable to PreDM.

β -cell function, assessed using ISS and the insulinogenic index, progressively declined from Low 1h-PG to High 1h-PG to PreDM. Insulin sensitivity decreased across all three groups over time. The progression from High 1h-PG to T2D occurred 0.9 years earlier than from Low 1h-PG. Notably, all participants first crossed the 1h-PG threshold for T2D (209 mg/dL),

and 74% exceeded the 1h-PG threshold for impaired glucose tolerance (IGT; 155 mg/dL) before reaching T2D.

Based on these findings, the study concluded that High 1h-PG NGT represents an intermediate risk category between Low 1h-PG NGT and PreDM, offering a potential window for early lifestyle intervention to preserve β -cell function.

In a Position Statement published in March, the International Diabetes Federation (IDF) highlighted the role of 1h-PG “as a more sensitive and practical method” to detect intermediate hyperglycemia and type 2 diabetes in at-risk individuals. The IDF states that individuals with a 1h-PG ≥ 155 mg/dL are classified as having intermediate hyperglycemia and should be advised to adopt lifestyle interventions and referred to a diabetes prevention program. Those with a 1h-PG ≥ 209 mg/dL are considered to have type 2 diabetes, requiring a repeat test to confirm the diagnosis, followed by further evaluation and appropriate treatment. The IDF concluded that current OGTT criteria for intermediate hyperglycemia and type 2 diabetes should be redefined to incorporate a 1h-PG level².

References

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2. Bergman M, et al. International Diabetes Federation Position Statement on the 1-hour post-load plasma glucose for the diagnosis of intermediate hyperglycaemia and type 2 diabetes. *Diabetes Res Clin Pract.* 2024 Mar;209:111589. doi: 10.1016/j.diabres.2024.111589.

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