LIFE Science Hub
JOURNAL OF SCIENCE
EXPANDING KNOWLEDGE ABOUT NUTRITION AND HEALTH

ORIGINAL RESEARCH

Elevated 1-hour plasma glucose levels are associated with dysglycemia, impaired beta-cell function, and insulin sensitivity: a pilot study in a real-world clinical setting - Evidence review

Dott. A. Conte[1]

1 Nutritional Biologist, Italy

1. ABSTRACT

The analyzed study evaluated whether elevated plasma glycemia at one hour during an oral glucose tolerance test could identify individuals with metabolic alterations already present, even if they were not classified as prediabetic by traditional fasting and two-hour values. The full text or abstract of the publication is not available in the provided material; therefore, quantitative details, sample size, and analysis of the original study are not reported in the available material.In the narrative of "The Choice to Live in Health or Illness" by Dr. A. Colonnese and R. Panzironi, the publication contributes to the concept that a one-hour glycemia equal to or greater than 155 mg/dL may serve as an early signal of reduced pancreatic beta-cell function and insulin sensitivity. Independent studies confirm that this profile is associated with poorer beta-cell function and, in selected cohorts, a higher probability of subsequent prediabetes or diabetes. However, this threshold alone does not constitute a diagnosis of diabetes, nor does it prove that every individual will develop the disease.

ONLINE ARTICLE

ARTICLE INFORMATION

Published: November 13, 2026
Updated: November 13, 2026

DOI 10.5281/zenodo.24205752

MISSION

LIFE Science Hub – Journal of Science was founded with the aim of making scientific knowledge accessible without giving up methodological rigour, quality of sources and authoritativeness of content. The journal promotes the dissemination of knowledge in the health, nutrition, medical and longevity sciences, building a bridge between the world of research and society.

Through articles, reviews, in-depth analyses and expert contributions, the Journal champions evidence-based medicine and science, fostering a correct interpretation of scientific data and countering misinformation. Every piece of content is developed with the aim of translating the complexity of research into understandable, useful and applicable information, while keeping intact the principles of accuracy, transparency and scientific independence.

Free from political, industrial and commercial influence, the journal stands as an authoritative and independent editorial space, dedicated to promoting scientific culture, professional development and the growth of health awareness among the public.

2. ANALYZED STUDY

The research question was whether blood glucose measured one hour after glucose intake during an OGTT (oral glucose tolerance test) could identify metabolic alterations before they emerged using standard criteria, which are primarily based on fasting blood glucose and blood glucose after two hours.The hypothesis relevant to the book's section is that a one-hour blood glucose level above 155 mg/dL is not merely a transient value, but may be associated with lower insulin sensitivity and reduced pancreatic beta-cell function. Beta cells are the cells in the pancreas that produce insulin, the hormone that helps glucose enter tissues.This is precisely the narrative function of the publication in this section: to support the initial segment of the chain suggesting that an excessive glycemic response after a glucose load can make metabolic alterations visible when conventional classification still indicates normal glucose tolerance. The study can document associations between the one-hour value and metabolic indicators; it cannot, on its own, establish that exceeding the threshold causes diabetes or that early identification automatically changes the clinical course.

3. MATERIALS AND METHODS OF THE ORIGINAL STUDY

The provided material indicates that the publication is a pilot study conducted in a real-world clinical setting, focusing on the relationship between one-hour plasma glycemia, dysglycemia, beta-cell function, and insulin sensitivity. However, the full text and abstract are not available in the provided material.The sample size, inclusion and exclusion criteria, collection period, sex and age composition, the complete OGTT protocol, the techniques used, endpoints, comparison groups, and statistical analyses are not reported in the available material. Therefore, it is not possible to attribute numerical values, confidence intervals, P-values, or risk estimates not present in the input to the original study.

4. RESULTS

From the verified title of the publication and the excerpt from the book, it appears that the authors observed an association between elevated one-hour plasma glucose levels, dysglycemia, impaired beta-cell function, and lower insulin sensitivity. In simple terms, in people with a higher glycemic peak after a glucose load, the pancreas and insulin-responsive tissues appear to function less effectively.The available material does not report the magnitude of the observed differences, group means, P-values, odds ratios, or other quantitative results from the original study. Therefore, it is not possible to determine from the provided material alone whether the associations were adjusted for age, sex, body mass index, or other factors that can influence both glycemia and metabolic risk.The relevant finding for the book's paragraph remains qualitative: a one-hour blood glucose level above 155 mg/dL was used as an indicator associated with a less favorable metabolic profile, even in individuals who did not necessarily appear abnormal according to the conventional OGTT classification.

5. INTERPRETATION

An early and marked increase in glycemia after a glucose load suggests that glucose regulation may be less efficient. To return glucose to lower levels, both a timely insulin response from beta cells and good insulin sensitivity in the muscles, liver, and adipose tissue are required.In technical terms, the publication subject to the evidence review supports the link between high one-hour glycemia and two components of the pathophysiology of type 2 diabetes: reduced beta-cell function and reduced insulin sensitivity. This link is consistent with the paragraph, but it does not equate to proof that everyone above the threshold will develop diabetes.The value of 155 mg/dL should therefore be interpreted as a possible marker of risk and early metabolic alteration, not as an independent diagnosis. Its utility depends on the population studied, the test protocol, individual clinical characteristics, and confirmation through other appropriate tests.

6. INDEPENDENT SUPPORTING EVIDENCE

Initial confirmation of the prognostic component comes from the San Antonio Heart Study. In 1,611 individuals without diabetes at baseline, followed for 7-8 years, a one-hour glycemia of at least 155 mg/dL during an OGTT helped identify subjects with normal glucose tolerance but a high future risk of type 2 diabetes. The study was a prospective observational

study: it therefore shows that the value anticipated a subsequent outcome, without demonstrating that the glycemic peak was the direct cause [1].The component related to pancreatic function was also studied in 113 overweight or obese young people without diabetes, aged between 10 and 20 years. Participants with a one-hour glycemia equal to or greater than 155 mg/dL had a lower disposition index: this index integrates insulin secretion and insulin sensitivity and indicates how well the pancreas is able to compensate for insulin demand. The mean value was 295.1 versus 498.6 mg/kg/min in young people below the threshold, with P<0.001. The difference was present regardless of the glucose tolerance category [2]. The sample was small and composed of young people with excess weight, so the result cannot be automatically transferred to the general adult population.In a cross-sectional Korean cohort, 43 adults with normal glucose tolerance but elevated one-hour glycemia were compared with 149 subjects below the threshold and 52 people with impaired glucose tolerance. Beta-cell function indices adjusted for insulin sensitivity, namely the oral disposition index and ISSI-2, were lower in the group with elevated one-hour glycemia and similar to those of the group with impaired glucose tolerance [3]. This confirms the passage in the book regarding already compromised beta-cell function, but the cross-sectional design does not allow for measuring individual future risk.Further longitudinal evidence was collected in 233 obese Latin American youths with a family history of type 2 diabetes. After an annual follow-up of up to eight years, the group with a one-hour glycemia of at least 155 mg/dL showed a greater reduction in beta-cell function over time. Among those who had normal glucose tolerance at baseline, the value above the threshold was associated with a 2.5 times greater probability of developing prediabetes; 95% confidence interval 1.6-4.1, P=0.0001 [4]. The data reinforces the idea of an early signal, but it concerns a high-risk pediatric population and does not prove the efficacy of an intervention based solely on the one-hour value.

7. CONFLICTING EVIDENCE

No directly conflicting evidence of sufficient relevance has been identified; this does not prove the absence of contrary results.However, there is a significant difference in the mechanistic component. The Korean study found that insulin sensitivity was substantially comparable between subjects with normal tolerance and high one-hour glycemia and those below the threshold, while beta-cell function was worse in the former group [3]. This picture does not fully align with the narrative of a simultaneous and uniform reduction in insulin sensitivity. The discrepancy suggests that, in some populations and early stages, the defect in insulin secretion may be more evident than insulin resistance.Consequently, the most consistently confirmed signal is the association between elevated one-hour glycemia and reduced compensatory capacity of beta cells. The relative magnitude of the contribution of insulin resistance may instead vary based on age, population origin, adiposity, family risk, and the method used to estimate insulin sensitivity.

8. QUADRO COMPARATIVO E SINTESI DELLE EVIDENZE

The table distinguishes the publication subject to the Evidence Review from independent research that confirms specific steps of the book's narrative.

Quadro comparativo

Reference	Study type	Population or model	Main result	Direction of evidence	Strength of evidence
Original study	Pilot study in a real-world clinical setting	Not reported in available material	Association between elevated one-hour glycemia, dysglycemia, lower insulin sensitivity, and impaired beta-cell function	biologically consistent evidence	preliminary
[1]	Prospective observational	1,611 adults without diabetes at baseline, San Antonio Heart Study	One-hour glycemia helped identify normotolerant individuals at high future risk of diabetes after 7-8 years	direct confirmation	moderate
[2]	Observational with experimental metabolic assessments	113 overweight or obese young people without diabetes	One-hour glycemia ≥155 mg/dL associated with lower disposition index and therefore lower beta-cell function relative to insulin sensitivity	direct confirmation	moderate
[3]	Cross-sectional observational	244 Korean adults with normal or impaired glucose tolerance	Lower beta-cell function in normotolerant individuals with elevated one-hour glycemia, similar to that of subjects with impaired tolerance	direct confirmation	moderate
[4]	Prospective observational	233 obese Latin American youth with a family history of diabetes	One-hour glycemia ≥155 mg/dL associated with greater beta-cell deterioration and a 2.5-fold higher probability of prediabetes	direct confirmation	moderate

9. SINTESI EDITORIALE E CONCLUSIONI

CONCLUSIONS

The original publication is consistent with its use in the book's section: elevated glycemia at one hour during an OGTT may signal metabolic alterations that do not necessarily emerge from fasting or two-hour values. Independent evidence quite robustly supports the association with less efficient beta-cell function and a higher probability of future dysglycemia in selected populations.However, the 155 mg/dL threshold should not be interpreted as an automatic diagnosis of prediabetes or diabetes. Its significance depends on the clinical context and the population being evaluated. The component related to insulin resistance appears moderately supported, but less consistent compared to the impairment of beta-cell function.

Aggiornato al 17/11/2026. Questo contenuto riflette una sintesi divulgativa delle evidenze scientifiche al momento della pubblicazione e non sostituisce il parere medico.

10. TRANSPARENCY AND SCIENTIFIC RESPONSIBILITY

Artificial Intelligence was used solely as a tool for editorial and documentary support. All content, interpretations, bibliographic citations and conclusions have been verified, reviewed and approved by the author, who assumes full scientific responsibility for them.

The manuscript was also subjected to independent peer review prior to publication.

To ensure the greatest transparency, the complete history of the article, including the dates of submission, revision, acceptance and publication, as well as information on the peer review process, is available on the dedicated Article History page.

11. RIFERIMENTI BIBLIOGRAFICI

[1] **One-Hour Plasma Glucose Concentration and the Metabolic Syndrome Identify Subjects at High Risk for Future Type 2 Diabetes**
Abdul-Ghani et al., 2008
Diabetes Care
DOI: https://doi.org/10.2337/dc08-0225

[2] **One-hour plasma glucose concentration during the OGTT: what does it tell about b-cell function relative to insulin sensitivity in overweight/obese children?**
Tfayli et al., 2011
Pediatric Diabetes
DOI: https://doi.org/10.1111/j.1399-5448.2011.00745.x

[3] **Normal Glucose Tolerance with a High 1-Hour Postload Plasma Glucose Level Exhibits Decreased b-Cell Function Similar to Impaired Glucose Tolerance**
Oh et al., 2015
Diabetes & Metabolism Journal
DOI: https://doi.org/10.4093/dmj.2015.39.2.147

[4] **One-Hour Glucose During an Oral Glucose Challenge Prospectively Predicts b-Cell Deterioration and Prediabetes in Obese Hispanic Youth**
Kim et al., 2013
Diabetes Care
DOI: https://doi.org/10.2337/dc12-1861