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ORIGINAL RESEARCH

Glycemic index, glycemic load, and glycemic response: an international scientific consensus summit of the International Carbohydrate Quality Consortium (ICQC) - Evidence review

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1. ABSTRACT

The publication analyzed is an international consensus document that re-examined the role of the glycemic index and glycemic load in the assessment of carbohydrates. Experts concluded that post-meal glycemia is relevant to metabolic health and that the glycemic index is a valid and reproducible method for classifying carbohydrate-containing foods.In Chapter 2 and Chapter 14 of "The Choice to Live in Health or Illness" by Dr. A. Colonnese and R. Panzironi, the study contributes to the narrative that it is not only the quantity of carbohydrates that matters, but also the speed at which they increase glycemia. Independent evidence confirms the reproducibility of the method, shows small improvements in glycemic control in people with diabetes, and identifies prospective associations between higher dietary values of glycemic index or glycemic load and a higher incidence of type 2 diabetes. However, important limitations remain: individual response varies, and observational studies do not demonstrate a causal relationship.

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MISSION

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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 glycemic index, glycemic load, and postprandial glycemic response could be reliably used to assess the metabolic quality of carbohydrates. The hypothesis discussed was that foods with the same amount of carbohydrates can produce different increases in glycemia and that this difference is relevant for the prevention and management of metabolic alterations.The relevance to "The Choice to Live in Health or Illness" by Dr. A. Colonnese and R. Panzironi concerns two points. The first is that the glycemic index describes the relative speed at which a food increases glycemia. The second is that the glycemic index and glycemic load, which also incorporates the quantity actually consumed, must be interpreted within the context of the entire diet.As a consensus statement, the publication is not a single clinical trial. It can therefore synthesize expert judgment on the available literature, but it cannot directly prove that reducing glycemic spikes prevents diabetes, cardiovascular disease, oxidative stress, or inflammation in every person.

3. MATERIALS AND METHODS OF THE ORIGINAL STUDY

The publication stems from an international scientific summit held in Stresa, Italy, in June 2013, involving experts in carbohydrate research.The design was that of a consensus statement based on the discussion of controversies regarding the glycemic index, glycemic load, and glycemic response. No participant enrollment, control group, dietary interventions, follow-up duration, or statistical analyses typical of a clinical trial are reported. The document evaluates existing literature and formulates shared conclusions on the significance of postprandial glycemia and the use of the glycemic index and glycemic load.

4. RESULTS

The central finding of the consensus is that postprandial glycemia, i.e., the increase in blood glucose after a meal, is relevant to overall health. The authors also recognized the glycemic index as a valid and reproducible method for classifying carbohydrate-containing foods based on their relative ability to raise blood glucose levels.The panel concluded that dietary patterns with a low glycemic index and low glycemic load are relevant to the prevention and management of type 2 diabetes and coronary heart disease, and likely obesity as well. The glycemic load combines the speed of the response, expressed by the glycemic index, with the amount of available carbohydrates in the portion. For this reason, two foods or two meals with a similar glycemic index can have different impacts if the portions provide very different amounts of carbohydrates.The authors also clarified that the glycemic index and glycemic load do not replace other criteria for diet quality. Dietary fiber, whole grains, food structure, and the overall composition of the meal remain important elements. The available material does not report numerical effect values, statistical analyses, or original experimental results from the Summit.

5. INTERPRETATION

In simple terms, the glycemic index helps us understand how quickly the carbohydrates in a food tend to raise blood glucose levels compared to a reference. The glycemic load adds an essential piece of information: how much of that food is actually consumed. This distinction is consistent with the chapters of the book, in which the quality of carbohydrates is considered alongside their quantity.The publication subject to the Evidence Review documents, above all, the initial segment of the narrative: the glycemic response does not depend solely on the grams of carbohydrates, and the glycemic index and glycemic load are complementary tools for describing it. The hypothesis that repeated glycemic spikes contribute over time to insulin resistance, inflammation, oxidative stress, and cardiovascular disease is biologically plausible, but it is not directly proven by the consensus document.The main limitation is methodological. A consensus statement can be very useful when interpreting a broad body of literature, but the strength of its conclusions depends on the quality and heterogeneity of the studies included. It is therefore necessary to verify separately the reproducibility of the glycemic index, the clinical effects of low glycemic index or glycemic load diets, and the associations with long-term outcomes.

6. INDEPENDENT SUPPORTING EVIDENCE

The technical validity of the glycemic index was examined in a multicenter study conducted across seven centers on 68 healthy adults. The same five foods were tested using a standardized procedure. Mean glycemic index values did not differ significantly between centers; using capillary blood samples, i.e., obtained from a small finger prick, the standard deviation between laboratories was approximately 9 points. This confirms that the glycemic index can be measured with reasonable reproducibility if the method is standardized, while still showing residual variability [1].Regarding clinical application, a systematic review with meta-analysis of 29 randomized comparisons, totaling 1,617 people with type 1 or type 2 diabetes, compared low glycemic index or glycemic load dietary patterns with control diets of higher index or load. Diets with a low glycemic index or glycemic load reduced glycated hemoglobin, an indicator of average blood glucose over the previous months, by 0.31 percentage points compared to controls (95% confidence interval from −0.42 to −0.19; P<0.001). Reductions in certain lipid markers, body weight, and C-reactive protein, an inflammatory marker, were also observed. The average effect was small but clinically relevant; however, heterogeneity between studies was high for glycated hemoglobin, with an I^2 of 75%, signaling significant differences between interventions and participants [2].Prospective confirmation comes from three large US cohorts, which followed a total of 205,157 adults initially free of diabetes, cardiovascular disease, or cancer. During 3,800,618 person-years of observation, 15,027 new cases of type 2 diabetes were recorded. People in the highest quintile of glycemic index had a 33% higher risk of diabetes compared to those in the lowest quintile; for glycemic load, the risk was 10% higher. The association was more pronounced when high glycemic index or load was combined with a low intake of cereal fiber. These data support the direction of the book's narrative, but remain observational and do not prove that the glycemic index is the direct cause of diabetes [3].Overall, independent evidence supports three distinct levels: the glycemic index is measurable with standardized protocols; reducing glycemic index or load can modestly improve certain metabolic parameters in diabetes; higher dietary values are associated with a greater future incidence of type 2 diabetes. None of these studies, on its own, demonstrates the entire sequence proposed in the book regarding oxidative stress, inflammation, endothelial dysfunction, and cardiovascular disease.

7. CONFLICTING EVIDENCE

A point of caution concerns the variability of the glycemic response within the same person. In a study of 23 healthy adults, the average glycemic index value of white bread varied between repeated sessions; among the 14 participants who completed three sets of tests, the average coefficient of variation between sessions was 30%. The analysis indicated that intra-individual variability was higher than inter-individual variability [4].This result does not prove that the glycemic index is useless. Rather, it shows that the value assigned to a food is an average obtained under standardized conditions and cannot predict with absolute precision the response of every individual at every meal. Meal composition, portion size, time of day, insulin sensitivity, and other personal characteristics can modify postprandial glycemia. No directly conflicting evidence of sufficient relevance has been identified; this does not prove the absence of contrary results.

8. QUADRO COMPARATIVO E SINTESI DELLE EVIDENZE

The table distinguishes the publication subject to the review from the independent research used to verify specific passages of the book's narrative.

Quadro comparativo

Reference	Study type	Population or model	Main result	Direction of evidence	Strength of evidence
Original study	Scientific consensus statement	International experts and peer-reviewed literature	Recognizes glycemic index and glycemic load as useful tools and the importance of postprandial glycemia.	biologically consistent evidence	moderate
[1]	Multicenter study	68 healthy adults, seven international centers	Glycemic index values for five foods did not differ significantly between centers; better precision with capillary blood.	direct confirmation	moderate
[2]	Systematic review and meta-analysis of RCTs	1,617 people with type 1 or type 2 diabetes; 29 randomized comparisons	Low glycemic index or glycemic load diets reduced glycated hemoglobin by 0.31 percentage points compared to controls.	direct confirmation	high
[3]	Prospective cohorts and updated meta-analysis	205,157 US adults without diabetes at baseline	Higher glycemic index and glycemic load were associated with a higher incidence of type 2 diabetes.	indirect confirmation	moderate
[4]	Experimental repeatability study	23 healthy adults undergoing repeated tests with white bread	Within-person variability contributed more than between-person variability to glycemic index results.	discordant evidence	moderate

9. SINTESI EDITORIALE E CONCLUSIONI

CONCLUSIONS

The analyzed publication correctly supports the idea that the postprandial glycemic response depends on both the quantity and quality of carbohydrates. The glycemic index is a standardized tool useful for describing the relative response of a food, while the glycemic load adds the effect of the portion consumed.Independent evidence confirms that dietary patterns with a low glycemic index or load can modestly improve glycemic control in people with diabetes and that higher dietary values are associated with a higher incidence of type 2 diabetes. This confirmation is moderate because individual responses vary and because long-term associations alone do not prove causality. Therefore, the glycemic index and glycemic load should be interpreted together with fiber, the degree of refinement, the overall quality of the diet, and the individual's characteristics.

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.

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