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Ginger in type 2 diabetes: effects on glycemia, HbA1c, and cholesterol

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1. ABSTRACT

A clinical study evaluated whether 1.2 grams of ginger daily, added to standard care for 90 days, would alter certain metabolic values in type 2 diabetes. Fasting glycemia decreased in the treated group, but the direct comparison with the placebo did not show statistically significant differences.The authors' summary describes a randomized, double-blind trial, which is a study where assignment occurs by chance and neither participants nor researchers know the treatment received during the trial. Adults with type 2 diabetes on oral antidiabetic medication and with glycated hemoglobin, or HbA1c, between 6% and 10% were included. HbA1c indicates the average glucose exposure over the previous months. After 90 days, 103 people completed the study: 47 in the ginger group and 56 in the placebo group. In the group that received ginger, fasting glycemia was reduced by an average of 29.55 mg/dL; in the placebo group, the average reduction was 9.25 mg/dL. However, the difference between the groups was not statistically significant. HbA1c and total cholesterol also decreased in both groups, without a significant difference attributable with certainty to the ginger. The data therefore suggest a possible metabolic signal, but do not prove that 1.2 grams per day produce a stable or generalizable clinical benefit.

VIDEO ARTICLE

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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. WHAT THIS RESEARCH ANALYZED

In type 2 diabetes, the body may struggle to use the glucose present in the blood. To understand whether ginger could support metabolic control, Carvalho and colleagues compared 1.2 g of dried ginger daily with the same amount of placebo for 90 days. The participants were between 20 and 80 years old, were taking oral antidiabetic drugs, and were not using insulin.The primary outcome concerned fasting venous glycemia and HbA1c. Fasting glycemia captures glucose levels after many hours without food; HbA1c, on the other hand, shows the average glucose exposure over the preceding weeks. Total cholesterol, triglycerides, LDL cholesterol, HDL cholesterol, and HOMA-IR—a calculated index that estimates insulin resistance—were also evaluated. These outcomes describe laboratory markers, not complications, hospitalizations, or quality of life.

3. WHAT RESULTS EMERGE FROM THE STUDY

The most favorable data concerns fasting glycemia. In the ginger group, the mean change was −29.55 mg/dL, compared to −9.25 mg/dL in the placebo group. Within the ginger group, the change was statistically significant, with P=0.001. However, the comparison between the two groups yielded P=0.130: the result therefore does not allow us to attribute the difference to ginger rather than to random variability or other factors with sufficient certainty.HbA1c also decreased more with ginger, from 8.40% to 8.14%, compared to 8.36% to 8.29% with placebo. The difference between groups was not significant, with P=0.765. Total cholesterol decreased in both groups, by 11.62 mg/dL with ginger and by 8.09 mg/dL with placebo, with no significant difference between the strategies, P=0.884. In other words, favorable numerical changes are observed, but not statistical proof of the treatment's superiority.

4. WHY THIS STUDY IS RELEVANT

This work is useful because it tests ginger in people with type 2 diabetes, using a placebo and a randomized assignment procedure. This design reduces the risk that any change depends solely on expectations, initial differences between participants, or the natural progression of metabolic values.The most important point, however, is to interpret the result correctly. The study by Carvalho and colleagues shows that a dose of 1.2 g per day was studied alongside standard therapy and that the ginger group had a numerically greater reduction in fasting glycemia. It does not prove that ginger replaces medication, that it improves glycemic control for everyone, or that it prevents cardiovascular, renal, or neurological complications. This very distinction connects the biological signal to its actual clinical utility.

5. STUDY LIMITATIONS AND WHAT IT DOES NOT DEMONSTRATE

The main limitation is the final sample size: 103 participants completed the protocol. A sample of this size may not detect moderate differences and makes it more uncertain to extend the results to other populations. Furthermore, the 90-day follow-up is relatively short for evaluating an indicator such as HbA1c and does not provide information on the duration of any potential effects.The study reports two adverse events, diarrhea and gastrointestinal disturbance, one per group. This data is not sufficient to define long-term safety or safety in people with different clinical conditions. Since no variable showed a significant difference in the comparison between ginger and placebo, the results do not demonstrate a certain causal effect on glycemia, HbA1c, cholesterol, or HOMA-IR. They also do not allow for the definition of an appropriate dose for daily use.

6. INDEPENDENT CONFIRMATORY EVIDENCE

Direct confirmation of a potential signal regarding glycemia and HbA1c comes from the trial by Arablou and colleagues. In 70 adults with type 2 diabetes, 1,600 mg of ginger per day for 12 weeks was compared with a placebo. The study found significant reductions in fasting glycemia, HbA1c, insulin, HOMA, and total cholesterol compared to the placebo [1]. This supports the transition from supplementation to changes in certain metabolic markers, but confirmation remains limited: the sample size was small, the period was short, and long-term clinical outcomes were not studied.A systematic review with meta-analysis of 10 randomized publications found an average reduction in fasting glycemia of 18.81 mg/dL and in HbA1c of 0.57

percentage points [2]. A more recent meta-analysis of 13 studies observed average reductions in fasting glycemia and HbA1c of 16.27 mg/dL and 0.41 percentage points, respectively [3]. The two summaries reinforce the general consistency of the signal, but also show high heterogeneity: the studies differed in doses, duration, formulations, and participant characteristics. The level of confirmation is therefore moderate for laboratory markers and low for concrete clinical benefits.

7. CONFLICTING EVIDENCE

Evidence is not uniform across all hypothesized biological processes. In a randomized trial of 48 people with type 2 diabetes, 2 g of ginger per day for 10 weeks did not statistically significantly reduce NF-kB p65, a protein that helps activate cellular inflammation programs [4]. This result does not directly contradict the effect on glycemia observed by Carvalho and colleagues, because it did not evaluate the same outcomes; however, it limits the idea that any metabolic benefit always depends on a measurable reduction of this inflammatory signal.A study of 64 people with type 2 diabetes also showed a selective response of inflammatory markers: after eight weeks, TNF-alpha and hs-CRP decreased, while interleukin-6 did not differ significantly from the placebo [5]. This indicates that cytokines, which are proteins involved in inflammatory communication, do not necessarily respond in the same way. These differences, which depend on the marker, dose, and context, reduce the generalizability of a single explanation. No directly conflicting evidence sufficiently relevant to the specific outcome of the Carvalho trial has been identified; this does not prove the absence of contrary results.

8. QUADRO COMPARATIVO E SINTESI DELLE EVIDENZE

Comparison between independent publications and the results of the trial by Carvalho and colleagues.

Quadro comparativo

Publication	Design and model	Main result	Relationship to the Carvalho study
Arablou et al., 2014 [1]	RCT in 70 adults with type 2 diabetes; 1,600 mg/day for 12 weeks	Significant reductions in glycemia, HbA1c, insulin, HOMA, and total cholesterol compared to placebo	Direct confirmation of the potential improvement in glycemic and metabolic markers
Ebrahimzadeh et al., 2022 [2]	Systematic review and meta-analysis of 10 randomized publications	Mean reductions in fasting glycemia and HbA1c; no significant overall effect on lipids	Confirms the glycemic signal, but scales back the interpretation regarding cholesterol
Chen et al., 2026 [3]	Meta-analysis of 13 randomized placebo-controlled trials	Modest reductions in glycemia and HbA1c, with high heterogeneity; no significant change in total cholesterol	Moderate confirmation of glycemic markers and caution regarding other outcomes
Honarvar et al., 2019 [4]	RCT in 48 people with type 2 diabetes; 2 g/day for 10 weeks	No statistically significant reduction in NF-kB p65	Indirect evidence discordant with a uniform inflammatory explanation
Mahluji et al., 2013 [5]	RCT in 64 people with type 2 diabetes; two tablets daily for eight weeks	TNF-alpha and hs-CRP decreased, but not interleukin-6 compared to placebo	Shows that inflammatory signals may respond selectively

9. SINTESI EDITORIALE E CONCLUSIONI

EDITORIAL CONCLUSION

The trial by Carvalho and colleagues examined 1.2 grams of ginger per day for 90 days in people with type 2 diabetes already undergoing oral therapy. The treated group showed a numerically greater reduction in fasting glycemia compared to the placebo group. However, the difference between the groups was not statistically significant. HbA1c and total cholesterol also did not show a proven superiority of ginger in direct comparison. This makes the result interesting, but not conclusive. Independent randomized studies and meta-analysis overall suggest possible reductions in glycemia and HbA1c, while the effects on lipids and inflammatory mechanisms remain variable. Differences between doses, formulations, duration, and participants prevent these data from being transformed into a universal clinical rule. Ginger may be a subject of research as nutritional support, but it does not replace medication, personalized nutrition, physical activity, and medical monitoring of type 2 diabetes.

Aggiornato al 04/11/2026. 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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