



Ginger in fatty liver disease with type 2 diabetes: what a clinical trial shows

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1. ABSTRACT

A clinical study evaluated whether three months of ginger capsules could modify metabolic and liver parameters in people with type 2 diabetes and non-alcoholic fatty liver disease. Some metabolic changes emerged, but there was no documented improvement in the amount of fat in the liver. The authors' summary describes a randomized, double-blind, placebo-controlled study. Randomization assigns participants to groups by chance; the double-blind method prevents both participants and researchers from knowing which treatment is being taken. Seventy-six people with type 2 diabetes and non-alcoholic fatty liver disease—that is, fat accumulation in the liver not attributed to alcohol consumption—received 1,000 mg of ginger twice a day or a placebo for three months. Body circumferences, blood pressure, blood tests, and FibroScan, a non-invasive test that estimates liver fat and stiffness, were measured. In both groups, body mass index, circumferences, and transaminases—enzymes that can increase when the liver is under stress—decreased. In the ginger group, insulin and HOMA-IR, an estimated index of insulin resistance, decreased, and HDL cholesterol increased. Systolic and diastolic blood pressure also improved. However, no significant changes emerged in inflammatory markers or FibroScan indices related to steatosis and controlled attenuation. The work therefore suggests a possible short-term metabolic signal, not proof that ginger reduces liver fat or alters the course of the disease.

VIDEO ARTICLE



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2. WHAT THIS RESEARCH ANALYZED

The 2024 study by Ghoreishi and colleagues evaluated whether ginger could support metabolic control in individuals with both type 2 diabetes and non-alcoholic fatty liver disease. The 76 participants were randomly assigned to take either ginger or a placebo for three months. The dosage was 2 g per day. The researchers evaluated weight and circumferences, blood pressure, glycemia, lipids, insulin, and HOMA-IR, a calculation that estimates insulin resistance. They also measured transaminases, inflammatory markers, and FibroScan. The latter does not observe liver cells directly, but provides non-invasive estimates of liver fat and stiffness. The controlled design reduces some risks of bias, but the significance of the data depends primarily on the comparison between groups. A reduction observed only compared to the baseline value may, in fact, also depend on changes common to the participants, not necessarily on the supplementation.

3. WHAT RESULTS EMERGE FROM THE STUDY

The clearest practical result concerns certain metabolic indicators, rather than a proven reduction in liver fat. In the group that took ginger, insulin and HOMA-IR decreased compared to baseline, with P-values of 0.002 and 0.004, respectively. A P-value indicates how compatible a result is with the hypothesis of no statistical difference; it does not, on its own, measure the clinical utility of the effect. In the same group, HDL cholesterol—often referred to as "good" cholesterol—improved, as did systolic and diastolic blood pressure. The reported P-values were 0.01 for HDL, 0.02 for systolic blood pressure, and less than 0.0001 for diastolic. However, both the ginger group and the placebo group showed reductions in body mass index, circumferences, and transaminases. Furthermore, inflammatory markers and FibroScan estimates of steatosis did not change significantly. The study does not report evidence of regression of hepatic steatosis.

4. WHY THIS STUDY IS RELEVANT

The research is relevant because it considers a population with two conditions that often coexist: type 2 diabetes and fat accumulation in the liver. Insulin

resistance means that muscles, liver, and adipose tissue respond less effectively to insulin; an estimated improvement in this could be consistent with a more favorable metabolic profile. However, the value of the study is limited. Ginger was evaluated as a supplement and not as a substitute for diet, physical activity, medication, or clinical monitoring. The lack of change in instrumental liver indices serves as a reminder that a signal regarding insulin or blood pressure does not automatically equate to a structural benefit for the liver.

5. STUDY LIMITATIONS AND WHAT IT DOES NOT DEMONSTRATE

Three months is a short period to establish whether a metabolic change persists or alters the progression of liver disease. Furthermore, the sample size of 76 people limits the precision of the estimates and the possibility of applying them to all people with type 2 diabetes. The study does not demonstrate that ginger cures hepatic steatosis, or prevents fibrosis, cirrhosis, or cardiovascular events. It also does not demonstrate that the observed variations depend on a specific compound in ginger or that the same regimen is appropriate outside of the experimental context. FibroScan is useful for non-invasive monitoring, but it does not replace all the information obtainable through clinical and, when indicated, histological evaluation. The lack of variations in FibroScan indices therefore requires a cautious interpretation.

6. INDEPENDENT SUPPORTING EVIDENCE

A meta-analysis by Zhou and colleagues pooled four randomized trials involving 177 adults with non-alcoholic fatty liver disease. The overall result supported an improvement in alanine aminotransferase, total cholesterol, LDL cholesterol, and HOMA-IR compared to placebo [1]. This strengthens the chain linking ginger to metabolic and liver stress indicators, in line with the insulin signals observed by Ghoreishi. The level of confirmation is low-to-moderate: the included studies were few, short, and used different preparations; furthermore, the synthesis does not prove an effect on fibrosis or clinical outcomes. A trial by Kamari and colleagues involved 160 children with obesity and fatty liver disease, divided into four groups for 12 weeks. The combination of ginger and an anti-inflammatory diet

was associated with improvements in glycemia, liver enzymes, lipids, inflammation, and estimated steatosis [2]. This indirectly supports the hypothesis that a nutritional intervention with ginger can act on multiple metabolic indicators. However, it does not confirm the isolated effect in adults with diabetes: age, clinical context, and dietary co-intervention differ.

7. CONFLICTING EVIDENCE

A randomized trial by Rafie and colleagues, conducted on 46 adults with non-alcoholic fatty liver disease over 12 weeks, found reductions in fasting glycemia, HOMA-IR, alanine aminotransferase, and certain markers in the ginger group. However, it did not find

significant differences between groups regarding the degree of steatosis, fatty liver index, blood pressure, HDL, triglycerides, aspartate aminotransferase, and various inflammatory markers [3]. This result is directly relevant: it confirms that some metabolic signals can change, but indicates that the effects are not uniform and that improvements in blood tests do not prove a reduction of fat in the liver. The sample size was small, and all participants received guidance on diet and physical activity, factors that can attenuate the differences. No directly conflicting evidence of sufficient relevance was identified beyond these inconsistent outcomes; this does not prove the absence of contrary results.

8. QUADRO COMPARATIVO E SINTESI DELLE EVIDENZE

Available publications show potentially favorable metabolic signals, but inconsistent results regarding direct indicators of fatty liver disease.

Quadro comparativo

Publication	Model and intervention	Main result	Relationship to the Ghoreishi study
Zhou et al., 2023 [1]	Meta-analysis of 4 trials, 177 adults with non-alcoholic fatty liver disease	Aggregate improvements in ALT, lipids, and HOMA-IR	Indirect confirmation of metabolic signals; does not demonstrate hepatic regression
Kamari et al., 2023 [2]	Randomized trial, 160 children with obesity and fatty liver; ginger with or without anti-inflammatory diet	The combination with diet improved more metabolic and hepatic indicators	Indirect confirmation, limited by age and dietary co-intervention
Rafie et al., 2020 [3]	Randomized trial, 46 adults with fatty liver; 1.5 g/day for 12 weeks	Some metabolic markers improved, but no difference in fatty liver severity	Highlights inconsistent results on hepatic outcomes

9. SINTESI EDITORIALE E CONCLUSIONI

EDITORIAL CONCLUSION

The trial by Ghoreishi and colleagues explored ginger as nutritional support in people with type 2 diabetes and non-alcoholic fatty liver disease. Over three months, the treated group showed favorable changes in insulin, HOMA-IR, HDL cholesterol, and blood pressure. These results suggest a possible effect on certain aspects of metabolism, but they are not sufficient to claim a general clinical benefit. The indices obtained via FibroScan and inflammatory markers did not change significantly. This point is

central: an improvement in some blood tests does not equate to demonstrating that liver fat has decreased or that liver damage has regressed. Other available research shows a partially consistent direction regarding insulin resistance and transaminases, but also null results on various outcomes. Overall, the evidence justifies further research, not the use of ginger as an autonomous treatment for fatty liver disease or diabetes.

Aggiornato al 21/10/2026. 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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