



Curcuma longa and postprandial glycemia: clinical evidence in overweight individuals

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1. ABSTRACT

A 12-week clinical study evaluated a specific *Curcuma longa* extract in adults who are overweight and have normal glycemia or glycemia compatible with prediabetes. Compared to the placebo, certain inflammatory markers and glycemic values following a glucose load were more favorable. However, the sample size and the formulation limit the conclusions. The authors' summary describes two complementary parts. The first was conducted on RAW264.7 cells, murine immune cells used in the laboratory to study inflammation. The extract and some of its components, turmeronols and bisacurone, reduced the production of inflammatory signals after stimulation with lipopolysaccharide, a bacterial substance used experimentally to activate these cells. The second part is a randomized, double-blind, placebo-controlled clinical trial: random assignment, lack of knowledge of the treatment by participants and researchers, and comparison with inactive capsules. 110 adults between 40 and 69 years old were randomized; the efficacy analysis included 81 people who completed the protocol. After 12 weeks, the treated group showed greater reductions in high-sensitivity C-reactive protein and glycated hemoglobin, as well as favorable differences in some values of the oral glucose tolerance test. The study indicates an association with these indicators, but does not prove that the reduction in inflammation is the direct cause of the glycemic change.

VIDEO ARTICLE



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2. WHAT THIS RESEARCH ANALYZED

The practical significance lies in understanding whether a concentrated product, distinct from the spice added to meals, can influence blood markers linked to low-grade inflammation and glucose response. In 2024, Uchio and colleagues first studied RAW264.7 cells, which are murine macrophages (immune cells that produce inflammation signals). In these cells, the extract reduced interleukin-1 β , interleukin-6, tumor necrosis factor- α , and nitric oxide following experimental stimulation. The human portion was a randomized, double-blind, placebo-controlled clinical trial. It included individuals aged 40–69 with a body mass index between 23 and less than 30 kg/m² and glycemia not diagnostic for diabetes. The capsules provided, in two daily units, 400 micrograms of bisacurone and 100 micrograms each of turmeronol A and B. The researchers measured high-sensitivity C-reactive protein, glycated hemoglobin, and the response to 75 g of glucose in an oral glucose tolerance test. This test observes how glycemia and insulin change in the two hours following glucose intake.

3. WHAT RESULTS EMERGE FROM THE STUDY

For the reader, the main result is that after 12 weeks, the group receiving the extract showed some more favorable average values compared to the placebo, especially in the late phase of the glucose tolerance test. High-sensitivity C-reactive protein, a biomarker of systemic inflammation but not a disease diagnosis, changed by -0.034 mg/dL in the treated group and by $+0.006$ mg/dL in the placebo group. Glycated hemoglobin, which roughly reflects the average glycemia of the last few months, changed by -0.08% versus 0.00% . In the glucose tolerance test, at week 12, glycemia at 120 minutes decreased by 36.1 mg/dL in the treated group and by 24.7 mg/dL in the placebo group; the difference at the individual check was significant. The area under the glycemic curve between 60 and 120 minutes, which is an estimate of glucose exposure in the second hour, also decreased more with the extract: -29.3 versus -20.2 mg·h/dL. The overall group-time effect was not significant for all outcomes. Therefore, the data indicate specific favorable signals, not a uniform improvement in every glycemic or insulin

measure.

4. WHY THIS STUDY IS RELEVANT

This work is useful because it examines an identifiable formulation, a defined duration, and repeated clinical measurements. It does not treat turmeric as a generic ingredient: the extract was an 8:1 ratio mixture of an aqueous fraction and a fraction obtained via supercritical carbon dioxide. Consequently, the results are not transferable to the turmeric powder used in cooking, nor to products with curcumin, piperine, or different absorption technologies. The study links a possible biological pathway to results in humans. Simply put, lower inflammatory signals could be associated with better glucose management after a sugar-rich meal. On a technical level, the authors propose that turmeronols and bisacurone attenuate mediators produced by macrophages and, indirectly, interfere less with insulin signaling. This is biological plausibility, not proof that such a chain of events occurred in the participants.

5. STUDY LIMITATIONS AND WHAT IT DOES NOT DEMONSTRATE

The results should be interpreted with caution. The efficacy analysis did not include all 110 randomized participants, but rather 81 individuals who adhered to the protocol; this may reduce the robustness compared to an intention-to-treat analysis. Some differences were significant only at individual measurement time points, while several overall group-time analyses were not. The 12-week duration does not allow for the establishment of long-term effects, nor for the evaluation of diabetes prevention or clinical outcomes. Furthermore, all authors were employees of the company that markets health products; the same company funded the study, designed the protocol, provided the capsules, contributed to the manuscript, and decided on the submission to the journal. Data collection and analysis were performed by a contract research organization. These elements do not invalidate the data, but they increase the need for independent replication. The study does not prove that the extract treats prediabetes, replaces clinical interventions, or is effective for people with diagnosed diabetes.



6. INDEPENDENT CONFIRMATORY EVIDENCE

Initial confirmation concerns the response after meals. Thota and colleagues conducted a randomized crossover study on healthy adults: each participant received, on different occasions, curcumin, curcumin with omega-3, or a placebo before a standardized meal. Curcumin reduced the area under the curve for postprandial insulin by 26% compared to the placebo, though it did not demonstrate a long-term clinical effect. This supports, with a moderate but indirect level of evidence, the hypothesis that certain formulations can modify the acute metabolic response; the product, dose, duration, and population differ from those in Uchio [1]. A second piece of evidence comes from Dolati and colleagues, who randomized 40 sedentary, overweight women into four groups for eight weeks. Curcumin alone reduced fasting glycemia compared to baseline values; the combination with aerobic training improved certain indices of insulin resistance and C-reactive protein. The key takeaway is the convergence between inflammation and metabolism, but the effect of physical activity makes it impossible to attribute all changes to curcumin. The confirmation is therefore indirect and limited by the small sample size [2].

7. CONFLICTING EVIDENCE

There are relevant conflicting results. In a crossover study of 14 healthy adults, Wickenberg and colleagues administered 6 g of *Curcuma longa* along with an oral glucose load. They did not observe a significant reduction in postprandial glycemia or the glycemic index; instead, insulin increased at certain time points. This is a direct contrast regarding the immediate glucose response, but it concerns a single dose of the spice in capsules, not the extract studied by Uchio [3]. Kocher and colleagues also did not detect differences in glycemia or inflammatory markers after six weeks of micellar curcuminoids in 42 adults with moderately elevated cholesterol and C-reactive protein, despite an increase in blood curcuminoid levels. Finally, Hellmann and colleagues found no protection against prednisolone-induced insulin resistance in 24 overweight or obese men treated for a short period with 400 mg/day of curcumin. These data show that effect, dose, formulation, and clinical

context can change the outcome [4][5].

8. QUADRO COMPARATIVO E SINTESI DELLE EVIDENZE

Independent publications do not all evaluate the same formulation or the same context; the comparison therefore serves to narrow, not to broaden, the conclusions of the study by Uchio and colleagues.

Quadro comparativo

Publication	Model and main results	Relationship to the Uchio study	Cautious interpretation
Thota et al., 2018 [1]	Randomized crossover study in healthy adults; 26% reduction in postprandial insulin area with curcumin.	Indirect confirmation of the potential modification of the metabolic response after meals.	Acute effect, different formulation and population.
Dolati et al., 2020 [2]	Eight-week RCT, 40 overweight women; favorable signals on fasting glycemia and, with exercise, some metabolic indices.	Indirect confirmation of the link between curcumin, metabolic markers, and inflammation.	Four small groups; exercise is an important confounding factor.
Wickenberg et al., 2010 [3]	Crossover study in 14 healthy adults; 6 g of turmeric did not reduce postprandial glycemia.	Direct contradictory evidence on acute glycemic response.	Single-dose spice, not a specific extract taken for weeks.
Kocher et al., 2016 [4]	Crossover study in 42 adults; micellar curcuminoids showed no differences in glycemia or markers of inflammation.	Contradictory evidence on inflammation and metabolism in people at moderate risk.	Formula, objectives, and participants are not comparable.
Hellmann et al., 2023 [5]	Parallel RCT in 24 men with overweight or obesity; no protection against metabolic alterations induced by prednisolone.	Contradictory evidence in a specific pharmacological context.	Small sample size and experimental model not comparable to habitual conditions.

9. SINTESI EDITORIALE E CONCLUSIONI

EDITORIAL CONCLUSION

The 2024 study by Uchio and colleagues suggests that a specific blend of *Curcuma longa* extracts, taken for 12 weeks, may be associated with favorable changes in high-sensitivity C-reactive protein, glycated hemoglobin, and certain glycemic values following an oral glucose tolerance test in adults who are overweight and have glycemia not diagnostic for diabetes. The research integrates an experiment on murine macrophages and a controlled clinical trial, but the two parts do not demonstrate a direct causal relationship between the cellular mechanisms and the human outcomes. Independent publications offer compatible signals regarding the postprandial metabolic response, but also null results under different conditions. The picture therefore remains

preliminary and formulation-dependent. It is incorrect to extend these data to the culinary spice, other supplements, or the therapeutic management of prediabetes and diabetes. Larger, longer, and independent studies with clinically relevant outcomes are needed.

Aggiornato al 22/10/2026. 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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