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Research Article

Effect of Herbal Tea Consumption on Blood Sugar Levels: A Review of Current Evidence

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Abstract

Diabetes mellitus, particularly type 2 diabetes mellitus (T2DM), has become a major public health concern worldwide. Along with medicines, healthy eating, regular physical activity, and weight management, there is growing interest in simple dietary approaches that may help improve blood glucose control. Herbal teas are one such approach. They have been used traditionally for centuries and are now increasingly studied for their possible effects on blood sugar, insulin sensitivity, inflammation, and oxidative stress. Unlike green or black tea, which are prepared from *Camellia sinensis*, herbal teas are made from different plant parts, including leaves, flowers, roots, seeds, and bark. Common examples include chamomile, cinnamon, fenugreek, and ginger.

This review examines the available scientific evidence regarding the effect of herbal tea consumption on blood glucose levels, with particular emphasis on type 2 diabetes. Recent clinical evidence suggests that some herbal teas may have beneficial effects on fasting blood glucose and glycated haemoglobin (HbA1c). A recent systematic review and meta-analysis of 14 randomised controlled trials involving 551 people with T2DM reported significant reductions in fasting blood glucose and HbA1c following consumption of non-*Camellia sinensis* herbal teas (Zarasvand et al., 2025). Chamomile tea has shown promising effects on HbA1c and insulin resistance, while fenugreek and cinnamon have also demonstrated potential benefits. Evidence for ginger, however, remains inconsistent. The possible mechanisms include delayed carbohydrate digestion and absorption, improved insulin sensitivity, antioxidant activity, and reduction of inflammation. Despite these encouraging findings, differences in herbal species, dosage, preparation, duration of intervention, and participant characteristics make it difficult to draw firm conclusions. Herbal tea should therefore be considered a complementary dietary option rather than a replacement for prescribed diabetes treatment. Further well-designed clinical trials are needed to determine the long-term effectiveness and appropriate dosage of different herbal teas.

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1. INTRODUCTION

Diabetes mellitus is one of the most common metabolic disorders affecting people across the world. It occurs when the body is unable to produce enough insulin, use insulin effectively, or both. As a result, glucose accumulates in the blood and, when this condition persists, can damage the eyes, kidneys, nerves, heart, and blood vessels. Type 2 diabetes mellitus is the most common form of diabetes and is strongly associated with insulin resistance, unhealthy dietary patterns, physical inactivity, obesity, and other lifestyle factors.

Good control of blood glucose is one of the most important goals in diabetes management. Traditionally, treatment has focused on medicines together with dietary modification and physical activity. However, many people are also interested in foods, beverages, and medicinal plants that might provide additional benefits. This interest has increased the scientific investigation of traditional herbal remedies.

Herbal tea is particularly interesting because it is easy to prepare and is already part of the daily diet in many cultures. Unlike pharmaceutical preparations, herbal teas are generally consumed as beverages made by soaking or boiling plant material in water. Examples include chamomile tea, cinnamon tea, ginger tea, fenugreek tea, hibiscus tea, and several other plant-based preparations.

It is important to distinguish herbal tea from conventional tea. Green, black, oolong, and white teas are produced from *Camellia sinensis*. Herbal teas, in contrast, are prepared from other plants and therefore have different chemical compositions and biological properties.

Several herbs contain compounds such as flavonoids, polyphenols, alkaloids, terpenoids, and soluble fibers. Laboratory and clinical studies suggest that some of these compounds may influence glucose metabolism, insulin action, oxidative stress, and inflammation (Alam et al., 2021). This raises an important question: **Can drinking herbal tea actually help control blood sugar levels?**

The purpose of this review is to examine the available scientific evidence and discuss the potential role of herbal tea as a complementary dietary approach for maintaining healthy blood glucose levels.

2. Herbal Tea and Blood Glucose Regulation

Blood glucose is controlled through a complex interaction involving insulin, the liver, muscles, adipose tissue, the digestive system, and several hormones. After a carbohydrate-containing meal, glucose enters the bloodstream and stimulates insulin secretion from the pancreas. Insulin then helps glucose move from the blood into cells where it can be used for energy or stored.

In people with type 2 diabetes, cells gradually become less responsive to insulin. This condition, known as insulin resistance, can result in increased blood glucose levels. Over time, pancreatic β -cells may also become unable to produce sufficient insulin.

Some plant compounds may influence different stages of this process. For example, certain phytochemicals can slow the

digestion of carbohydrates, potentially reducing the rapid rise in blood glucose after meals. Other compounds may improve insulin signalling or increase glucose uptake by cells. Antioxidant and anti-inflammatory effects may also indirectly improve metabolic health.

However, the effect of an herbal tea should not be exaggerated. A laboratory study showing that a plant extract affects glucose metabolism does not necessarily mean that drinking one cup of the tea will produce the same effect. The amount of active compound, preparation method, and frequency of consumption are all important.

3. Evidence from Clinical Studies

The strongest recent evidence comes from a systematic review and meta-analysis published by Zarasvand et al. (2025). The researchers examined randomized controlled trials investigating non-*Camellia sinensis* herbal teas in people with type 2 diabetes. Fourteen trials involving 551 participants were included.

The analysis showed that herbal tea consumption was associated with significant reductions in fasting blood glucose and HbA1c. HbA1c is particularly important because it provides an estimate of average blood glucose over approximately the previous two to three months. The included studies used different herbs and doses, with the amount of herbal material generally ranging from approximately 2 to 20 g per day.

Although the findings were encouraging, the researchers also observed considerable differences among the studies. Participants differed in age, sex, geographical location, health status, diet, and diabetes treatment. The herbs, preparation methods, intervention duration, and control groups also varied (Zarasvand et al., 2025).

This means that it would be inappropriate to say that all herbal teas lower blood glucose to the same degree. Instead, the available evidence suggests that some herbal teas may contribute to better glycaemic control when used as part of an overall healthy lifestyle.

4. Chamomile Tea

Chamomile is one of the herbal teas that has received considerable attention in diabetes research. Chamomile is traditionally used for relaxation and digestive problems, but its flowers contain several biologically active compounds, including flavonoids such as apigenin.

One clinical trial by Raftaf et al. (2015) investigated the effects of chamomile tea in people with type 2 diabetes. Participants consumed chamomile tea after meals for eight weeks. The study reported improvements in HbA1c, insulin levels, and HOMA-IR, a measure commonly used to estimate insulin resistance. Improvements in some lipid parameters were also reported.

Another study by the same research group suggested that chamomile tea could improve glycaemic control and antioxidant status. The researchers observed reductions in HbA1c, insulin resistance, and markers of oxidative stress.

These findings are biologically plausible. Persistent high blood glucose can increase oxidative stress, and oxidative stress may further contribute to insulin resistance and pancreatic β -cell dysfunction. The antioxidant compounds found in chamomile may therefore provide an additional metabolic benefit.

However, the studies conducted so far have generally involved relatively small groups of participants and relatively short intervention periods. Therefore, larger studies are needed before chamomile tea can be recommended as a specific treatment for diabetes.

5. Cinnamon Tea

Cinnamon is another popular plant that has attracted interest because of its possible glucose-lowering properties. It contains compounds such as cinnamaldehyde and various polyphenols.

Cinnamon has traditionally been used to improve digestion and as a spice in food. Research suggests that some of its compounds may influence insulin signalling and glucose uptake.

Davis and Yokoyama (2011) conducted a meta-analysis of clinical trials examining cinnamon consumption and blood glucose. Their analysis found that cinnamon intake was associated with reductions in fasting blood glucose. Other studies have reported possible improvements in HbA1c, although the results have not always been consistent.

More recently, Moridpour et al. (2024) conducted an updated systematic review and dose-response meta-analysis of randomized controlled trials. The researchers found evidence suggesting that cinnamon supplementation may improve some measures of glycaemic control in people with type 2 diabetes.

It should be noted, however, that many clinical studies have examined cinnamon powder or concentrated preparations rather than cinnamon tea. Therefore, the findings cannot automatically be applied to a normal cup of cinnamon tea.

Another important consideration is the type of cinnamon. Cassia cinnamon can contain relatively high amounts of coumarin, a compound that may cause problems when consumed in large amounts over long periods. For this reason, excessive consumption of concentrated cinnamon products should be avoided.

6. Fenugreek Tea

Fenugreek (*Trigonella foenum-graecum*) is particularly important in South Asian traditional medicine and cuisine. Fenugreek seeds contain fiber, saponins, alkaloids, and other compounds that may influence glucose metabolism.

One possible explanation for its effect is the relatively high fiber content of fenugreek seeds. Soluble fiber can slow digestion and carbohydrate absorption, which may help reduce the rapid rise in blood glucose following a meal.

Neelakantan et al. (2014) conducted a meta-analysis of clinical trials involving fenugreek and reported reductions in fasting blood glucose, post-load glucose, and HbA1c. The researchers concluded that fenugreek could have beneficial effects on glycaemic control, although they also noted differences between studies.

More recent research has produced generally promising but somewhat mixed results. Shabil et al. (2023), in a systematic review and meta-analysis, reported a significant reduction in HbA1c but did not find statistically significant pooled effects on all measures of glucose control.

Similarly, Vajdi et al. (2024) reviewed clinical trials and found evidence suggesting that fenugreek supplementation may improve fasting plasma glucose, HbA1c, and insulin resistance. However, there is an important limitation. Much of the research has focused on fenugreek seeds, powder, or extracts rather than fenugreek tea. The amount of active material extracted into water during tea preparation may be substantially different. Therefore, more research specifically examining fenugreek tea is needed.

7. Ginger Tea

Ginger (*Zingiber officinale*) is another widely consumed herbal product. It is commonly used in tea because of its characteristic flavor and traditional association with digestive health. Ginger contains compounds such as gingerols and shogaols, which have antioxidant and anti-inflammatory properties.

Some experimental studies have suggested that ginger may improve insulin sensitivity and glucose metabolism. However, human clinical evidence is not as consistent as that for some other herbs.

Huang et al. (2019) conducted a systematic review and meta-analysis of ginger use in people with type 2 diabetes. The authors found evidence suggesting potential benefits for blood glucose control, but the number of available trials was relatively small.

A later systematic review and meta-analysis by Schumacher et al. (2024) included randomized controlled trials examining oral ginger supplementation. The pooled analysis did not find a statistically significant effect on fasting blood glucose or HbA1c, although individual studies showed different results.

This illustrates an important point in herbal medicine research: promising biological mechanisms do not always translate into a clear clinical effect. Ginger may still have nutritional value and other health benefits, but more research is required to establish whether regular ginger tea meaningfully lowers blood glucose.

8. How Might Herbal Tea Affect Blood Sugar?

There are several possible explanations for the observed effects of certain herbal teas.

8.1 Slowing carbohydrate digestion

Some plant compounds can inhibit digestive enzymes such as α -amylase and α -glucosidase. These enzymes help break down carbohydrates into glucose. Slowing this process could reduce the speed at which glucose enters the bloodstream after a meal.

8.2 Improving insulin sensitivity

Some phytochemicals may influence insulin signalling and glucose transport. If cells respond more effectively to insulin, glucose can be removed from the bloodstream more efficiently.

8.3 Antioxidant effects

High blood glucose can increase the production of reactive oxygen species. Excessive oxidative stress can damage cells and may contribute to insulin resistance. Many herbs contain flavonoids and other antioxidant compounds that may help counter oxidative stress.

8.4 Anti-inflammatory activity

Low-grade chronic inflammation is associated with obesity and insulin resistance. Certain plant compounds have anti-inflammatory properties that could potentially contribute to improved metabolic health.

8.5 Delayed intestinal glucose absorption

Some herbal products, particularly those containing soluble fiber such as fenugreek, may slow gastric emptying and glucose absorption. This may help reduce post-meal glucose spikes. These mechanisms are promising, but it is important to remember that much of the mechanistic evidence comes from laboratory or animal studies. Human studies are necessary to confirm whether these mechanisms produce clinically meaningful benefits.

9. Importance of Preparation and Consumption

The way herbal tea is prepared can influence its potential effect. Different brewing times, temperatures, quantities of plant material, and water volumes can produce beverages with very different concentrations of active compounds.

Another important factor is the addition of sugar. A person may drink a cup of herbal tea believing it is helping control blood glucose while adding several teaspoons of sugar or honey. This can substantially increase carbohydrate intake and potentially counteract the intended benefit.

For people concerned about blood glucose, herbal tea is generally best consumed **without added sugar or other caloric sweeteners**.

It is also important to distinguish ordinary tea from concentrated herbal supplements. A clinical trial may use several grams of dried plant material or a concentrated extract, whereas a commercially prepared tea bag may contain much less. Therefore, the results of supplementation studies should not automatically be interpreted as evidence that the same effect will occur with a single cup of tea.

10. Safety Considerations

The word "natural" does not necessarily mean "risk-free." Herbal products contain biologically active substances and can sometimes interact with medicines.

People with diabetes who take insulin or other glucose-lowering medicines should be particularly cautious when introducing herbal products that may potentially lower blood glucose. Combining several glucose-lowering approaches could increase the risk of hypoglycaemia in some individuals.

The quality of herbal products can also vary. Differences in plant species, cultivation, processing, storage, contamination, and adulteration may affect their safety and effectiveness.

For these reasons, herbal tea should be considered a **complementary dietary approach rather than an alternative to medical treatment**. Individuals with diabetes should continue prescribed medicines, follow dietary recommendations, remain physically active, and monitor their blood glucose as advised by their healthcare professional.

11. Limitations of Current Research

Although current findings are encouraging, several limitations should be considered.

First, many clinical trials have relatively small sample sizes. Second, interventions vary considerably in dosage and duration. Third, some studies examine capsules, powders, or concentrated extracts rather than tea beverages.

Another limitation is the variation in participants' diets and medications. A person who is already following a healthy diet and taking antidiabetic medication may respond differently from someone who has recently been diagnosed with diabetes.

There is also limited information about long-term consumption. Most studies last only a few weeks or months, whereas diabetes is a lifelong condition. Future studies should therefore examine whether any improvements in blood glucose are maintained over several years.

Standardization is another major issue. Researchers need to clearly report the botanical species, plant part, amount used, preparation method, and concentration of active compounds. Without this information, it is difficult to compare studies or determine an effective dose.

12. Future Research

Future research should focus on larger randomized controlled trials with standardized herbal tea preparations. Studies should ideally include both short-term and long-term measures of glucose control.

Important outcomes should include fasting blood glucose, postprandial glucose, HbA1c, insulin, HOMA-IR, body weight, lipid profile, blood pressure, and adverse effects.

Continuous glucose monitoring could also be useful because it provides information about glucose fluctuations throughout the day rather than relying only on occasional blood tests.

Researchers should also compare different preparation methods and doses. For example, it would be useful to determine whether one or two cups of a particular tea provide measurable benefits and whether consuming it before or after meals produces different effects.

Finally, research should examine whether herbal tea provides additional benefits when combined with standard diabetes treatment, rather than studying it in isolation.

13. CONCLUSION

The available evidence suggests that herbal teas may have a useful role as part of a healthy lifestyle for people concerned about blood glucose control. Recent evidence, particularly the systematic review and meta-analysis by Zarasvand et al. (2025), indicates that non-*Camellia sinensis* herbal tea

consumption may reduce fasting blood glucose and HbA1c in people with type 2 diabetes.

Among the herbs studied, chamomile and fenugreek have shown particularly encouraging results, while cinnamon also appears promising. Evidence for ginger is more inconsistent. The possible benefits may be related to the ability of certain plant compounds to influence carbohydrate digestion, insulin sensitivity, oxidative stress, inflammation, and glucose absorption.

At the same time, it would be premature to describe herbal tea as a treatment or cure for diabetes. Studies differ substantially in the type and quantity of herbs used, preparation methods, duration, and participant characteristics. More importantly, many studies investigate concentrated extracts rather than ordinary tea beverages.

From a practical perspective, unsweetened herbal tea can be a healthy, low-calorie beverage choice and may offer additional metabolic benefits, particularly when it replaces sugar-sweetened drinks. However, people with diabetes should not stop or reduce prescribed medicines because of herbal tea consumption.

Overall, herbal tea represents a promising area of nutritional research. With better-designed and longer clinical trials, it may become possible to identify specific herbal preparations that can safely and effectively complement conventional strategies for diabetes management.

REFERENCES

1. Alam S, Sarker MMR, Sarker MR, et al. Antidiabetic potential of dietary polyphenols: a mechanistic review. *Food Res Int.* 2021; 142:110383. doi: 10.1016/j.foodres.2021.110383.
2. Davis PA, Yokoyama W. Cinnamon intake lowers fasting blood glucose: meta-analysis. *J Med Food.* 2011;14(9):884-889.
3. Huang FY, Deng T, Meng LX, Ma XL. Dietary ginger as a traditional therapy for blood sugar control in patients with type 2 diabetes mellitus: a systematic review and meta-analysis. *Medicine (Baltimore).* 2019;98(13): e15054. doi:10.1097/MD.00000000000015054.
4. Moridpour AH, Kavyani Z, Khosravi S, Farmani E, Daneshvar M, Musazadeh V, et al. The effect of cinnamon supplementation on glycemic control in patients with type 2 diabetes mellitus: an updated systematic review and dose-response meta-analysis of randomized controlled trials. *Phytother Res.* 2024;38(1):117-130. doi:10.1002/ptr.8026.
5. Neelakantan N, Narayanan M, de Souza RJ, van Dam RM. Effect of fenugreek (*Trigonella foenum-graecum* L.) intake on glycemia: a meta-analysis of clinical trials. *Nutr J.* 2014; 13:7. doi:10.1186/1475-2891-13-7.
6. Rafrat M, Zemestani M, Asghari-Jafarabadi M. Effectiveness of chamomile tea on glycemic control and serum lipid profile in patients with type 2 diabetes. *J Endocrinol Invest.* 2015;38(2):163-170. doi:10.1007/s40618-014-0170-x.
7. Schumacher JC, Mueller V, Sousa C, Peres KK, da Mata IR, Menezes RCR, et al. The effect of oral supplementation of ginger on glycemic control of patients with type 2 diabetes mellitus: a systematic review and meta-analysis. *Clin Nutr ESPEN.* 2024; 63:615-622. doi: 10.1016/j.clnesp.2024.07.011.
8. Shabil M, Bushi G, Bodige PK, Maradi PS, Patra BP, Padhi BK, et al. Effect of fenugreek on hyperglycemia: a systematic review and meta-analysis. *Medicina (Kaunas).* 2023;59(2):248. doi:10.3390/medicina59020248.
9. Vajdi M, Noshadi N, Bonyadian A, Golpour-Hamedani S, Alipour B, Pourteymour Fard Tabrizi F, et al. Therapeutic effect of fenugreek supplementation on type 2 diabetes mellitus: a systematic review and meta-analysis of clinical trials. *Heliyon.* 2024;10(17): e36649. doi: 10.1016/j.heliyon. 2024.e36649.
10. Zarasvand SA, Ogawa S, Nestor B, Bridges W, Haley-Zitlin V. Effects of herbal tea (non-Camellia sinensis) on glucose homeostasis and serum lipids in type 2 diabetes mellitus: a systematic review and meta-analysis. *Nutr Rev.* 2025;83(3): e1128-e1145. doi:10.1093/nutrit/nuae068.

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