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Review Paper

A Review on: Nutraceuticals with Potentials for Management of Diabetes

Abdul Qadir*, Abhay Kumar, Pradeep Kumar

Ch. Sughar Singh Pharmacy College, Jaswantnagar Etawah, India.

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ABSTRACT

Diabetes mellitus is a chronic metabolic condition that leads to persistent hyperglycemia due to an impairment of insulin secretion, action, or both. The rising global burden of diabetes has catalyzed interest in adjunctive therapeutic modalities, including nutraceuticals. Nutraceuticals are bioactive chemicals originating from food sources that present health advantages beyond basic nutrition. Various nutraceuticals are capable of improving glycemic control, insulin sensitivity, or both, and decreasing complications of diabetes; examples include dietary fibre (soluble), omega-3 fatty acids, probiotics, chromium, cinnamon, fenugreek and plant polyphenols. In this review, we summarize the major classes of nutraceuticals, their mechanisms of action and therapeutic importance in Diabetes management

INTRODUCTION

High blood sugar that stays around too long marks diabetes, a condition tied to how the body handles insulin - either making it poorly or using it weakly. Lately, more people across the world face this issue, sparking curiosity about extra ways to manage it, like substances from food with added health perks. These substances, called nutraceuticals, come straight from what we eat yet do more than just feed us. Instead of only fueling cells, they may help balance glucose levels, sharpen the body's response to insulin, even lower risks linked to long-term damage. Fibre found in plants, oily fish fats known as omega-3s, friendly gut bacteria, trace minerals like chromium, spice extracts from cinnamon bark, seeds such as fenugreek, along with natural plant chemicals rich in antioxidants - all show signs of helping in small but meaningful ways. Though not replacements for standard care, their role quietly grows under closer study. Unexpected shifts happen when daily intake includes these elements - not magic fixes, rather subtle nudges toward steadier metabolism.

***Corresponding Author:** Abdul Qadir
Address: *Department of pharmacy: Ch. Sughar Singh Pharmacy College, Jaswantnagar Etawah , India*
Email ✉: ashrafisahab0@gmail.com

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Nutraceuticals commonly used in diabetes management include:

2. Classification of Nutraceuticals Used in Diabetes

Nutraceuticals used to treat diabetes include:
• Dietary fibre
• Omega-3 fatty acids
• Probiotics and prebiotics
• Polyphenols from plants
• Trace elements
• Herbal nutraceuticals
• Vitamins and antioxidants

3. Function of Significant Nutraceuticals

3.1 Dietary Fibre

Fibre has an impact on blood sugar regulation because it slows down stomach emptying and glucose absorption in the intestines. Soluble fibre creates a gel-like substance in the gut that reduces post-meal glucose spikes and increases insulin sensitivity. Psyllium and guar gum are common examples of fibre nutraceuticals in diabetic therapy.
Examples: Psyllium husk, Beta-glucan from oats, Guar gum etc.

3.2 Omega-3 Fatty Acids

The anti-inflammatory and cardioprotective properties of omega-3 fatty acids, specifically EPA and DHA, are well-known. In diabetic individuals, they can help reduce insulin resistance, improve lipids, and decrease inflammation-induced disorders.
Sources: Fish oil, Flaxseed, and Chia seed etc.

3.3 Cinnamon

Cinnamon is one of the most widely studied herbal nutraceuticals in diabetes. It improves insulin receptor activity, enhances glucose uptake by cells, and reduces fasting blood glucose levels.

3.4 Fenugreek

Fenugreek seeds pack soluble fibre along with a compound called 4-hydroxyisoleucine that nudges insulin release while helping the body handle sugar better. People have long turned to it in folk medicine when dealing with diabetes.

3.5 Chromium

Inside your body, chromium helps insulin work better. When people lack this mineral, taking extra might help their cells respond more smoothly to insulin. Some find it easier to manage blood sugar when they add chromium, especially if tests show low levels already. Not everyone notices a shift, yet those with deficiencies often see changes first.

3.6 Probiotics

A few good bugs in your belly can shift how your body handles sugar, also calming widespread irritation inside. These tiny helpers might ease the struggle cells have when using insulin, especially for people managing type 2 diabetes.

- dietary fibre
- omega-3 fatty acids
- probiotics and prebiotics
- plant polyphenols
- trace minerals
- herbal nutraceuticals
- vitamins and antioxidants

4. Role of Important Nutraceuticals

4.1 Dietary Fibre

Dietary fibre improves glycemic control by delaying gastric emptying and slowing intestinal

glucose absorption. Soluble fibre forms a gel in the intestine, reducing postprandial glucose spikes and improving insulin sensitivity. Psyllium and guar gum are commonly studied fibre nutraceuticals in diabetes.

Examples:

- psyllium husk
- oats
- beta-glucan
- guar gum

4.2 Omega-3 Fatty Acids

Omega-3 fatty acids, particularly EPA and DHA, are known for their anti-inflammatory and cardioprotective effects. In diabetic patients, they may help reduce insulin resistance, improve lipid profile and lower inflammation-related complications.

Sources:

- fish oil
- laxseed
- walnuts
- chia seeds

4.3 Cinnamon

Cinnamon is one of the most widely studied herbal nutraceuticals in diabetes. It improves insulin receptor activity, enhances glucose uptake by cells, and reduces fasting blood glucose levels.

4.4 Fenugreek

Fenugreek seeds contain soluble fibre and 4-hydroxyisoleucine, which stimulates insulin secretion and improves glucose tolerance. It is commonly used as a traditional remedy for diabetes.

4.5 Chromium

Chromium is an essential trace mineral involved in insulin signaling. Chromium supplementation may improve glucose tolerance and insulin sensitivity, particularly in chromium-deficient individuals.

4.6 Probiotics

Probiotics help modulate gut microbiota, which plays a role in glucose metabolism and systemic inflammation. They may improve insulin resistance and metabolic health in type 2 diabetes patients.

5. Mode of Action

Nutraceuticals work via a variety of mechanisms:

• insulin sensitization
• Enhancement of glucose utilization
• Decrease in glucose absorption by the intestines
• Antioxidant activity
• Anti-inflammatory property
• Protection of pancreatic beta cells

6. Benefits

• Derived from natural sources
• Limited side effects
• Can be used for a long time
• Prevention of complications
• Overall improvement in metabolic condition

7. Drawbacks

Though having promising effects, certain nutraceuticals exhibit inconsistency in results owing to variations in dosage, formulation, and duration of studies. Hence, further clinical trials on a larger scale are required.

CONCLUSION

Nutraceuticals have an important supportive role in the treatment of diabetes mellitus, including improved glycemic regulation and insulin sensitivity, and prevention of complications.

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REFERENCES

1. Derosa G, D'Angelo A, Maffioli P. The role of selected nutraceuticals in management of prediabetes and diabetes: an updated review of the literature. Part II. Phytother Res. 2024;38(11):5490-5532.
2. Bahadoran Z, Mirmiran P, Azizi F. Dietary polyphenols as potential nutraceuticals in management of diabetes: a review. J Diabetes Metab Disord. 2013;12:43.
3. Fernandes I, Oliveira J, Pinho A, Carvalho E. The role of nutraceuticals containing polyphenols in diabetes prevention. Metabolites. 2022;12(2):184.
4. Aalami-Harandi R, Karamali M, Asemi Z. The favorable effects of garlic intake on metabolic profiles in patients at risk of diabetes complications. J Matern Fetal Neonatal Med. 2015;28(17):2020-2027.
5. Abdoli M, Dabaghian FH, Goushegir A, et al. Anti-hyperglycemic effect of aqueous extract of Juglans regia leaf on type 2 diabetic patients: a randomized controlled trial. Adv Integr Med. 2017;4(3):98-102.
6. Wickenberg J, Ingemansson SL, Hlebowicz J. Effects of curcumin on postprandial glucose and insulin levels. Nutr J. 2010;9:43.
7. Chuengsamarn S, Rattanamongkolgul S, Luechapudiporn R, Phisalaphong C, Jirawatnotai S. Curcumin extract for prevention of type 2 diabetes. Diabetes Care. 2012;35(11):2121-2127.
8. Abutair AS, Naser IA, Hamed AT. Soluble fibers from psyllium improve glycemic response and body weight among type 2 diabetes patients: a randomized control trial. Nutr J. 2016;15:86.
9. Yin J, Xing H, Ye J. Efficacy of berberine in patients with type 2 diabetes mellitus. Metabolism. 2008;57(5):712-717.
10. Di Pierro F, Villanova N, Agostini F, Marzocchi R. Berberine and glycemic control in diabetes. Clin Lipidol. 2016;11(1):45-52.
11. Derosa G, Cicero AFG, Maffioli P. Berberine in glucose metabolism regulation. J Clin Med Res. 2017;9(5):421-426.
12. Shi GJ, Li Y, Cao QH, et al. Quercetin and diabetes management: a review. Biomed Pharmacother. 2019;109:108-116.
13. Gupta A, Birhman K, Raheja I, Sharma SK, Kar HK. Quercetin: a flavonoid with antidiabetic potential. J Pharm Pharmacol. 2016;68(11):1459-1472.
14. Dinesh S, Sharma S, Chourasiya R. Therapeutic applications of plant and nutraceutical-based compounds for management of type 2 diabetes mellitus: a narrative review. Curr Diabetes Rev. 2024;20(2):115-130.
15. Derosa G, Angelini F, Maffioli P. Nutraceuticals and supplements in management of prediabetes and diabetes. Nutrients. 2024;17(1):14.

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