

Diabetes: Know the Botanicals Patients Are Using

Expert outlines popular agents, their effects, and how they interact with standard therapies.

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WASHINGTON — Some of the botanical agents that are widely used among diabetic patients may have benefit—but more data are needed, Laura Shane-McWhorter, Pharm.D., said at the annual meeting of the American Association of Diabetes Educators.

Regardless of whether these unregulated products are beneficial, clinicians need to stay educated on the topic, since “this is something that all of us get asked about at one point or another,” said Dr. Shane-McWhorter, a certified diabetes educator and a professor at the University of Utah in Salt Lake City.

It’s important to make sure patients aren’t substituting complementary/alternative therapies for prescribed medications—cases of diabetic ketoacidosis have been reported among some who have, she said.

In addition, patients need to know that combining glucose-lowering botanicals with prescription diabetes medications may increase the risk of hypoglycemia.

The following are among the most popular of the more than 100 complementary/alternative therapies used to treat diabetes, Dr. Shane-McWhorter said.

Cinnamon

This everyday spice has received lots of attention lately. Its active ingredient, the polyphenolic polymer hydroxychalcone, is believed to enhance insulin action by increasing glucose uptake and glycogen synthesis. Side effects are limited mostly to the very rare topical allergic reaction.

But, like the others, it carries the theoretical potential for an additive hypoglycemic effect if combined with an insulin secretagogue.

In a randomized trial, 60 patients with type 2 diabetes were given 1, 3, or 6 grams of cinnamon four times daily or placebo. At 40 days, fasting blood glucose (FBG) had dropped from 209 to 157 mg/dL with 1 g cinnamon, from 205 to 169 mg/dL with 3 g, and from 234 to 166 mg/dL with 6 g. All changes were statistically significant compared with placebo, and the effect was still seen 20 days after cinnamon was stopped. Total cholesterol, triglycerides, and LDL cholesterol also dropped in the cinnamon groups (Diabetes Care 2003;26:3215-8).

The data are at least good enough to support a recommendation that patients use ½ to 1 teaspoon of ground cinnamon per day on cereal or other foods, she advised.

Gymnema sylvestre

From the Indian word “gurmar,” meaning “sugar-destroyer,” *Gymnema sylvestre* is thought to block both the craving for sweets and intestinal glucose absorption, increase cell permeability to insulin, and stimulate β -cell number and function.

Hypoglycemia has been reported with

this agent when combined with insulin secretagogues.

In two small studies, 400 mg/day of *Gymnema sylvestre* leaves significantly reduced hemoglobin A_{1c} values in both type 1 (from 12.8% to 8.2% at 26-30 months) and type 2 diabetic patients (from 11.9% to 8.5% at 20 months). The 27 type 1 patients were able to reduce their insulin doses by a mean of 15 units, while 5 of the 22 patients with type 2 diabetes were able to discontinue sulfonylureas (J. Ethnopharmacol. 1990;30:281-94).

However, these authors did not report randomization or blinding, and there was a high dropout rate among the type 1 patients. More human research using a standardized version of *Gymnema sylvestre* is now being conducted in the United States by the Omaha-based company Informulab Naturals (www.informulab.com).

Other diabetes medications may need to be adjusted for patients who choose to use *Gymnema sylvestre*, and it should not be used in patients already on combination therapy, Dr. Shane-McWhorter advised.

Fenugreek

Used for many years to promote lactation, fenugreek (*Trigonella foenumgraecum*) contains a variety of ingredients including saponins, alkaloids, coumarins, and glycosides. Its mechanism of action is thought to be related to its high fiber content. It delays gastric emptying and inhibits carbohydrate absorption, and may also stimulate insulin secretion. It has also been used to treat hyperlipidemia and constipation, in addition to diabetes.

Side effects include gastrointestinal hypersensitivity and topical allergies. It also may stimulate uterine contractions. Fenugreek should be used with care in peanut-allergic patients, since it belongs to the same plant family. Fenugreek may interact with other anticoagulants (including *Ginkgo biloba* and ginger), interfere with the effects of steroids and hormones, and/or potentiate the effects of monoamine oxidase inhibitors, she said.

In a study of 25 patients newly diagnosed with type 2 diabetes, 12 received 1 g/day of hydroalcoholic extract of fenugreek seeds, while the other 13 received placebo. The differences in FBG and 2-hour postprandial glucose were not significant at 2 months. However, the area under the curve for both blood glucose and insulin levels were lower in the fenugreek patients, who also showed significant improvements in both serum triglycerides and HDL cholesterol compared with placebo (J. Assoc. Physicians India 2001;49:1057-61).

Fenugreek may be appropriate for certain individuals, but it may be dangerous for women of childbearing age, Dr. Shane-McWhorter stressed.

Bitter Melon

This pickle-like vegetable from Southeast Asia and South America contains the hypoglycemics momordin and charantin, the alkaloid momordicine, and polypeptide P. It is thought to promote glucose uptake and glycogen synthesis.

It has a long list of reported side effects, including diarrhea, possible spontaneous abortion, and favism (acute hemolytic anemia) in individuals with hereditary glucose-6-phosphate dehydrogenase deficiency. Interactions have been reported with sulfonylureas and may occur with potassium depleters.

The largest study done with bitter melon (*Momordica charantia*) involved 100 patients with type 2 diabetes who ingested an aqueous suspension of the vegetable pulp after measurement of their fasting plasma glucose, which averaged 160 mg/dL. At 1 hour, glucose had dropped to 131 mg/dL. Following a 75-gram oral glucose load, mean glucose levels dropped to 222 mg/dL, compared with a mean of 257 mg/dL measured the previous day (Bangladesh Med. Res. Counc. Bull. 1999;25:11-3).

This agent should also be used with cau-

tion in women of childbearing age and should not be used during pregnancy, due to the risk for bleeding or contractions.

Ginseng

Both the American and Asian versions of

ginseng are in the steroid family of ginsenosides, which have various hormonal and central nervous system effects. Depending on which ginsenosides they contain (Rg1 vs. Rb1), they can either increase or decrease blood pressure and CNS activity.

Reported side effects include the “ginseng abuse syndrome,” characterized by hypertension, anxiety, and insomnia. Ginseng has also induced postmenopausal vaginal bleeding, and it interacts significantly with a long list of drugs including warfarin, diuretics, β -blockers, antipsychotics, antidepressants, and opiates.

In one randomized, controlled, multicenter trial, 36 patients with type 2 diabetes were given 100-200 mg ginseng or placebo daily for 8 weeks. Results included improvements in mood and psychomotor performance, as well as lower A_{1c} and FBG levels (Diabetes Care 1995;18:1373-5).

American ginseng appears to lower glucose better than does the Asian type, but few studies have been done in diabetic patients. Of concern are data from a U.S. analysis of 25 different commercial preparations of ginseng in which the actual quantities varied from 12% to 137% of what was indicated on the bottle (Am. J. Clin. Nutr. 2001;73:1101-6).

Patients who choose to take ginseng should do so within 2 hours of a meal to avoid hypoglycemia. To avoid hormone-like effects, some have suggested taking a 2 week holiday every 2-3 weeks, or limiting its use to 3 months, Dr. Shane-McWhorter said.

Aloe

A member of the lily family, aloe’s dried leaf juice was once used as a laxative ingredient, but that was stopped because it sometimes led to electrolyte depletion and intractable diarrhea. The gel component, however, is still used as a topical wound treatment and internally for diabetes. Its mechanism is thought to be related to its high fiber content.

In one single-blind, placebo-controlled study, FBG dropped from 250 to 142 mg/dL in 40 patients newly diagnosed with type 2 diabetes who took one tablespoon of aloe gel twice daily for 42 days, while FBG increased in the placebo group, from 251 to 257 mg/dL. Triglycerides also dropped in the aloe group, but there was no change in total cholesterol. (Phytomedicine 1996;3:241-3).

In another study of 40 patients already taking the sulfonylurea glibenclamide, 20 were also given aloe for 42 days. Again, aloe reduced FBG from 288 to 148 mg/dL compared with 289 to 290 mg/dL with glibenclamide alone (Phytomedicine 1996;3:245-8).

Although the data on aloe at this time are too limited to support its use as a treatment for diabetes, it is one of the most popular alternative diabetes remedies among Hispanic patients. If they choose to use it, the dosage is 50-200 mg/day of the leaf gel, not the cathartic (leaf juice) form.

Nopal

The fiber in this member of the cactus family is thought to decrease glucose absorption and possibly increase insulin sensitivity. Also known as “prickly pear,” it’s usually eaten cooked, and is also used to treat hyperlipidemia and to prevent hangovers. Side effects include increased stools and abdominal fullness, as well as possible additive hypoglycemia with secretagogues.

In one study, 16 patients with type 2 diabetes were assigned to broiled nopal (*Opuntia streptacantha Lemaire*), 10 to water, and 6 to broiled zucchini. At 2 hours, mean glucose dropped from 222 to 198 mg/dL and to 183 mg/dL by 3 hours (Diabetes Care 1988;11:63-6). In another study by the same group, nopal combined with sulfonylurea produced a 41-mg/dL drop in glucose at 3 hours, versus no change in those given water (Diabetes Care 1990;13:455-6).

Nopal’s main effect appears to be on postprandial glucose. Like aloe, it is also extremely popular among Hispanic diabetic patients, and since it is relatively benign and may have some benefit, it may play a role in diabetes management. Dosage is 500 g/day of broiled or fresh stems from the immature plant, she said.

Finally, Dr. Shane-McWhorter shared her way of responding to a patient who is reluctant to start on conventional diabetes medication and expresses a preference for a more “natural” approach.

“I tell them there’s a product that comes from a chemical class called biguanides which is derived from the botanical *Galega officinalis*, also known as goat’s rue. It’s called metformin.” ■

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