

A Natural Approach to Treating Diabetes

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Two of my uncles struggled with diabetes, and neither was ever able to get it under good control. Ultimately, both of them passed away from the complications of diabetes.

Likewise, my cousin is currently waiting for a kidney donorbecausediabeticnephropathyruinedhiskidneys. To me, diabetes is personal. Consequently, I wrote a book called A Guide To Complementary Treatments for Diabetes (2010, Square One Publishers). In it, I discuss the use of dietary supplements, nutrition and alternative therapies to help better manage diabetes. This article will present some of the information from my book.

Diagnosing diabetes

Since diabetes is characterized by high glucose (blood sugar) levels resulting from an inability to make or use sufficient insulin,1 the diagnosis of diabetes is based primarily upon blood glucose levels. Typically, this is done by means of blood test which measures your glucose levels. A fasting blood glucose test revealing a blood glucose level of 200 milligrams per deciliter (mg/dL) or greater is an indication of diabetes.

Symptoms of diabetes

Are you experiencing frequent urination, dehydration and increased thirst? If so, these are common symptoms of diabetes that occur when blood glucose levels over 200 mg/dL exceeds the kidneys ability to reabsorb the glucose back into the blood, causing some glucose to spill into the urine. In turn, these high glucose levels in the urine draw additional water from the blood which increases the amount of urine produced, resulting in the symptoms just listed. Other symptoms associated with diabetes include blurred vision, increased infections, and in some cases weight loss and increased appetite. In some cases, constant fatigue is the only overt symptom.2

Types of diabetes

Type 1 diabetes seems to be primarily an autoimmune disease, where the body's immune system destroys beta cells in the pancreas (the beta cells make insulin). Gestational diabetes is a type of glucose intolerance that can occur during pregnancy. The most prevalent type of diabetes, however, is type 2 diabetes, which accounts for about 90 to 95 percent of all diagnosed cases of diabetes. It tends to begin as insulin resistance, a disorder in which the cells do not use insulin effectively. Unfortunately, as the need for insulin increases, the pancreas can gradually lose its ability to produce it. People with type 2 diabetes can often control their blood glucose by following a healthy meal plan and exercise program, losing excess weight, and taking oral medication that helps to lower glucose levels. However, some people with type 2 diabetes may also need insulin to control their blood glucose.3

In pre-diabetes, individuals have higher than normal blood glucose levels, but not high enough to be classified as diabetes. This may occur after an overnight fast, or after a 2-hour glucose tolerance test. In the case of an overnight fast, their blood glucose level would be 100-125 mg/dL. In the case a of a 2-hour glucose tolerance test, their blood glucose level would be 140 to 199 mg/dL. People with pre-diabetes are at increased risk of developing type 2 diabetes, as well as heart disease, and stroke.

Complications of diabetes

When blood glucose levels remain high and are largely uncontrolled for a long period of time, the result can be a variety of serious complications. These complications include, but are not limited to, neuropathy (pain in the hands and feet), high blood pressure, cholesterol and triglyceride levels, peripheral vascular disease (including pain when walking and foot ulcers), retinopathy (the leading cause of blindness worldwide), and weight gain and/ or obesity. Subsequent chapters are devoted to these complications, with a specific focus on which dietary supplements and complementary therapies can help in their treatment.

Many of these complications are the result of glycosylated protein. This simply means that glucose has attached itself to protein. For example, glucose can attach itself to the protein in your red blood cells' hemoglobin and form glycosylated hemoglobin, also called hemoglobin A1C, HbA1C, or just A1C for short. If this process continues to excess, eventually you end up with compounds called Advanced Glycosylation End Products (AGE). These AGEs become permanent fixtures in our cells.

AGE impregnated cells are very reactive and react with one another, and other proteins. In the case of blood capillaries, they can result in the walls of the capillaries thickening, eventually causing the vessels to be blocked off. This is the underlying cause of kidney complications (nephropathy) and eye complications (retinopathy).

Another mechanism by which complications in diabetes result is excessive cellular sorbitol (a type of sugar-alcohol). Many cells in the body do not rely on insulin for glucose uptake, such as those in the eye. When you have the type of high blood glucose levels as seen in diabetes, it causes sorbitol to be produced inside these cells (i.e., of the retina), in high concentrations. Intracellular sorbitol disrupts the pressure balance between the inside and the outside of the cell, causing water to enter. This swelling of nerve cells is what is believed to be, at least in part, responsible for the nerve damage (neuropathy) caused by diabetes. (This does not mean that if you consume sorbitol in foods that it will have the same effect—it will not).

The importance of diet

The power of food over diabetes is amazing. What you eat and how much you eat of it makes all the difference in the world regarding the stability of your blood glucose levels. Consequently, it is no surprise that diet is the primary means for helping you to control your blood glucose levels and your diabetes. Perhaps the best thing you can do is to eat a low glycemic index diet.

Glycemic index (GI) is a numerical system of measuring how fast a carbohydrate triggers a rise in circulating blood glucose—the higher the number, the greater the blood glucose response. So a low GI food will cause a small rise, while a high GI food will trigger a dramatic spike, (clearly not a good thing for a diabetic). What is most significant is the effect that a low GI diet has on diabetics. In a review4 assessing the effects of low GI diets on glucose control in people with diabetes, researchers examined eleven clinical studies involving 402 type 1 or 2 diabetics whose diabetes was not already optimally controlled. When these diabetics followed the low-GI/low-GL diets, there was a statistically significant decrease in A1C levels. In addition, there were significantly fewer episodes of hypoglycemia (low blood glucose), in diabetics with a low-GI diet compared to those with a high-GI diet. Furthermore, the proportion of participants reporting more than 15 episodes of hyperglycemia (high blood sugar), per month was significantly lower for those following a low-GI diet. The researchers in this review concluded that a low-GI diet can improve glucose control in diabetes without causing additional hypoglycemic episodes.

Dietary supplements for diabetes

There are several dietary supplements with potential to help reduce blood glucose and A1C levels in diabetics. Most studies on these supplements were conducted on type 2 diabetics, although some were also conducted on type 1. In any case, given the mechanism of actions for these supplements, I tend to believe they would all be beneficial for either type 1 or 2 diabetics. Following is a discussion of some of these supplements.

Alpha-Lipoic Acid: Alpha lipoic acid (ALA) is a natural antioxidant manufactured by the body and is similar to certain vitamins. Unlike most other antioxidants however, it has the advantage of being soluble in both fat and water, so it can provide production both inside and outside of cells.5 ALA is also found in some foods, particularly liver and yeast.



In a placebo-controlled, multicenter study,674 patients with type-2 diabetes were given either a placebo, or 1800 mg ALA daily. When compared to the placebo group, those receiving the ALA had significantly greater insulin-sensitivity (reflecting improvement in insulin resistance), and reduced glucose levels. In other research, oral or intravenous use of ALA improved insulin sensitivity and reduction of glucose levels in patients with type 2 diabetes.7-9 Skin rash has been reported in some individuals after using oral doses of alpha-lipoic acid. Theoretically, the use of ALA with other hypoglycemic drugs might cause additive blood sugar lowering effects.11 In all of these studies, patients who took a daily dose of 600 to 1800 mg ALA orally or 500 to 1000 mg intravenously had significant improvement in insulin resistance and glucose effectiveness after 4 weeks of oral treatment or after 1 to 10 days of intravenous administration.

Chromium: Chromium is an essential trace mineral whose function in the body is to work with insulin to help transport glucose and to maintain healthy glucose levels. Chromium levels can be below normal in patients with diabetes.12-13 In a randomized, placebo-controlled study,14 180 men and women with type 2 diabetes were divided into three groups and supplemented with: 1) placebo, 2) 200 mcg chromium daily, or 3) 1,000 mcg chromium daily (from chromium picolinate for both doses). Subjects continued to take their normal medications and were instructed not to change their normal eating and living habits. The results were that both doses of supplemental chromium had significant beneficial effects on A1C, glucose, insulin, and cholesterol, although the benefits were greater with the higher dose. Other studies also show that taking chromium picolinate orally can decrease fasting blood glucose, decrease A1C levels, decrease triglyceride levels, and increase insulin sensitivity in people with type 2 diabetes.15-16 Some evidence also suggests that chromium picolinate might decrease weight gain and fat accumulation in type 2 diabetes patients who are taking a sulfonylurea17 (i.e., antidiabetic drugs that act by increasing insulin release from the beta cells in the pancreas).

Higher chromium doses (1,000 mcg) might be more effective and may work more quickly.18 Higher doses might also reduce triglyceride and total serum cholesterol levels in some patients.19-20 Additional research demonstrated that chromium picolinate also improved glucose levels in patients with type 1 diabetes, as well as gestational and steroidinduced diabetes.21-24 Theoretically, its use with other hypoglycemic drugs might cause additive blood sugar lowering effects.25 Taking 1,000 mcg chromium picolinate with 1 mg levothyroxine has been shown to decrease serum levels of levothyroxine

by 17% compared to taking levothyroxine alone,26 so levothyroxine should be taken at least 30 minutes before or 3-4 hours after taking chromium. In type 2 diabetics, 600 to 1,000 mcg daily are recommended.

Cinnamon Extract: The smell and taste of cinnamon in a warm, gooey cinnamon bun is probably enjoyable to just about everyone you know. Unfortunately, the gooey bun is not a particularly good choice for diabetics, but it turns out that the cinnamon may actually provide some significant health benefits. While the majority of clinical research shows that whole cinnamon powder is not effective for type 1 or type 2 diabetes,27 two studies conducted on a specific water-soluble cinnamon extract both showed consistent beneficial results. A placebo-controlled, double-blind study28 was conducted on 79 patients with type 2 diabetes. Subjects were given 336 mg daily of a water-soluble cinnamon extract (corresponding to 3 g of cinnamon powder) or a placebo for 4 months. Those using the cinnamon experienced a significant 10.3% reduction in fasting blood sugar, compared to a non-significant 3.4% reduction in the placebo group.

In another placebo-controlled, double-blind study,29 21 adults with metabolic syndrome (i.e., prediabetes) were given a water-soluble cinnamon extract (500 mg per day) or a placebo for 12 weeks. The results were that 83% of those given the extract experienced a significant decrease (about 8%) in fasting blood sugar, compared to only 33% in the placebo group who experienced a decrease. In addition, the cinnamon subjects also experienced a significant alteration in body composition. Their body fat decreased by 0.7%, and their muscle mass increased by 1.1%. These changes took place without alterations in the diet or physical activity of the subjects. Orally, cinnamon appears to be well-tolerated. A good dose is 500 mg daily of a water-soluble cinnamon extract.

Alternative Therapies

A number of alternative therapies exist for helping to lower blood glucose levels and/or help to control A1C levels. Following are a few.

Hypnosis: Hypnosis has a history of use in helping people with lifestyle changes including eating disorders and smoking cessation.30 It has been reported that about 20% of the time adolescents with type 1 diabetes do not adhere to diet and exercise program, as well as other self-care behaviors.31 In a hypnosis study,32 six type 1 diabetic adolescents were tracked for six months, and no changes were made in insulin, diet, or exercise. Then hypnosis was individually administered to the usual diabetes care program for 6 months. The results showed that average A1C dropped from 13.2 to 9.7%, and average fasting blood glucose (FBG) dropped from 426 to 149 mg/dl.



Yoga: Yoga, or Hatha Yoga, is a form of meditative exercise from India that is associated with certain postures, called asanas. A review of scientific literature has shown that yoga-based therapy for the management of type 2 diabetes has positive short-term effects on multiple diabetes-related outcomes.33 Furthermore,

research has shown Hatha yoga (physical movements and postures) and meditation to provide real benefits in stabilizing blood glucose.34 A group of researchers studied the response of people with type 2 diabetes to yoga therapy. Their study showed 70% of participants to have a fair to good response. After 40 days, there was a significant reduction in high blood glucose levels.

Exercise: Data from 20 studies 36 present a consistent picture indicating that regular physical activity substantially reduces risk of type 2 diabetes. In fact, a high level of physical activity is associated with a 20-30% reduction in diabetes risk. While this is good news for those who have not yet developed diabetes, what does this mean for people who already have it?

Lifestyle intervention programs that include exercise and healthy diets have long been known to exert beneficial effects on whole-body metabolism, in particular leading to enhanced insulin-sensitivity in type-2 diabetics.37 In fact, in a review of 20 studies, resistance training (e.g., weight-lifting) was shown to help improve blood glucose control and insulin sensitivity in adults with type 2 diabetes. Specifically, supervised resistance training was found to provide these benefits. When supervision was removed, however, the diabetics did not tend to be as regular with their exercise, and blood glucose control decreased.38 The take home message is that if you regularly perform resistance training (about 20 to 30 minutes, three times weekly), you are likely to experience significant benefits.

