

# How Do You Treat Diabetes and Syndrome X? Part One

Andrew Gaeddert, BA, AHG

Diabetes mellitus affects 16 million people in the U.S. It is the fourth leading cause of death, and is the principal cause of blindness (and most common cause of kidney failure) in this country. Many people have diabetes but don't know it. Type I diabetes, often called juvenile onset diabetes, affects five percent of the diabetic population. People with Type I diabetes are dependent on insulin. Type II diabetes, or non-insulin dependent diabetes, usually affects adults and can run in families. In recent years there has been a dramatic increase in Type II diabetes, due to hereditary factors; diets rich in processed foods; and lack of regular exercise. What was once referred to as adult onset diabetes (Type II) is now affecting obese children.

Many experts see diabetes as a marker for aging, as diabetics have been known to develop higher cholesterol levels and typically die of heart disease at a younger age than non-diabetics. It is hypothesized that elevated glucose generates a large number of free radicals, which damage cells. When practitioners hear about problems with glucose and insulin, they normally think of diabetes. In 1988, Stanford endocrinologist Gerald Reaven, MD, coined the term "syndrome X." Syndrome X refers to conditions brought about by excessive refined carbohydrate diets. This includes two or more of the following: insulin resistance; elevated cholesterol or triglycerides; abdominal obesity; and high blood pressure. Having syndrome X increases one's odds of getting diabetes or heart disease. The easiest way to diagnose insulin resistance is with a glucose tolerance test.

In abdominal obesity (also known as a "beer gut" or "pot belly"), glucose is stored as fat. Genetically, this has helped our species during times of famine. As the number of fat cells increases, the relative percentage of muscle cells decreases, reducing the number of sites for insulin to function. Obesity increases the risk of diabetes, heart disease and some cancers; obese women are more likely than thin women to develop breast cancer. Cholesterol and triglycerides are associated with an increased risk of heart disease and stroke. In syndrome X, there may be a high total cholesterol, low good HDL cholesterol; high LDL to HDL cholesterol ratio; or high triglyceride levels. There may also be oxidized LDL cholesterol.

## Sugar Overload

The body strives to maintain a balance of glucose (blood sugar). After meals, the body responds to the rise in blood glucose by secreting insulin, a hormone produced by the beta cells of the pancreas. Insulin lowers blood glucose by increasing the rate at which cells throughout the body absorb glucose. A decline in blood glucose causes the release of glucagon, a hormone produced by alpha cells in the pancreas. Glucagon stimulates the release of glucose stored as glycogen in body tissues, especially the liver. If the blood glucose falls rapidly, or if a person is angry or fearful, the result causes a release of epinephrine (adrenaline) and corticosteroids by the adrenal glands. These chemicals have the power to

break down stored glucose to provide extra energy to cope with a crisis. Insulin can increase blood pressure in a number of ways. It can increase the retention of sodium and increase the secretion of cortisol (a stress hormone), as well as trigger the sympathetic nervous system to speed up heart rate and blood pressure. Increased blood flow in the arteries can be due to obesity, as the heart has to pump harder through a larger body, and/or arteriosclerosis (hardening of the arteries), which makes the vessels less elastic. (Given equal water pressure, water moves through a narrow hose faster and with greater pressure than it does through a wider hose.)

Hypertension can lead to heart disease, stroke and kidney disease, and is also associated with memory loss and Alzheimer's disease. Causes of diabetes and syndrome X include stress; eating an excessive amount of processed foods; and lack of exercise. Physical and psychological stress increases cortisol levels, which reduces the ability of glucose to get into the cells, and is a risk factor for heart disease and Alzheimer's disease. Fatigue, mental exhaustion and anger are associated with excessive levels of cortisol.

Sweeteners including sugar; fructose; sucrose; maltose; lactose; corn syrup; and grape concentrate are consumed at alarming rates. The average U.S. consumption of sugar is over 150 pounds per year, compared with residents in the 1800s who consumed 12 pounds per year. If we go back further, sugar was rarely consumed at all, with the main sources of sweets being honey and whole fruits. In addition to being damaging on their own, sugars provide empty calories, which replace nutrient-dense foods. Sugar increases LDL cholesterol and triglycerides. It makes platelet cells aggregate, which tends to contribute to heart disease and stroke, and also reduces levels of calcium and phosphorus, which are needed to maintain healthy bones.

Diabetics are more prone than non-diabetes to having blood clots. In a study conducted at Harvard University, women 38-63 years of age consuming greater quantities of refined carbohydrates increased the risk of heart attacks by 40 percent. Dietary sugars reduce the efficacy of the immune system by crippling the activity of white blood cells [Challem, Jack et al. *Syndrome X* (New York: John Willey & Sons, 2000) 45]. Sugar substitutes, such as fructose, may be equally bad. For example, fructose, a highly refined product from corn, boosts cholesterol and triglyceride levels, and stimulates the production of insulin and cortisol.

### Complications of Diabetes

Chronic health problems associated with diabetes include atherosclerosis; diabetic neuropathy; diabetic retinopathy; diabetic foot ulcers; and kidney disease. Hypoglycemia, or low blood sugar, is much more common in Type I diabetes. Taking too much insulin, missing meals or overexerting for one's constitution can cause hypoglycemia. Sweating; nervousness; headache; tremor; hunger; and unpleasant dreams may all be signs of hypoglycemia. Diabetic ketoacidosis is also more common in type I diabetes, which can result in a buildup of ketones or ketoacides, which are produced by the breakdown of fat byproducts. Diabetics must measure ketone levels in the urine to prevent ketoacidosis, which can increase urination and cause thirst; fatigue; nausea; vomiting; and, if untreated, a coma. Nonketogenic hyperosmolar syndrome is caused by severe dehydration caused by lack of fluid intake; burns; stroke; pneumonia; and certain drugs such as diuretics; glucocorticoids; diazoxide; and phenytoin.

### Diabetes Medications

Standard medications for diabetes include chlorpropamide (Diabinese); glipizide (Glucotrol); glyuride

(Micronase); tolazamide (Tolinase); and tolbutamide (Orinase). They are not typically effective. After three months of continual treatment, they fail to adequately control blood sugar in 40 percent of cases. Even for the responders, the effects usually wear off. The long-term success at being able to control blood sugar levels is only about 30 percent [Murray, Michael. *Diabetes & Hypoglycemia* (Roseville: Prima Publishing, 1994), 15]. As these medications are sulfa compounds, those who have an allergy to sulfa drugs must not take them. Typical side-effects include digestive and skin reactions; headache; fatigue; and liver damage. In some cases, insulin needs to be prescribed with these drugs. Metformin (Glucophage), perhaps the most popular diabetes drug, improves insulin resistance but may increase the risk of heart disease by reducing levels of folic acid and vitamin B12 and increasing homocysteine levels. It can also cause headache; dizziness; fatigue; and digestive symptoms. In a study reported in the *New England Journal of Medicine*, moderate exercise (walking an average of 30 minutes a day five days a week) and dietary changes (lowering fat and overall calorie intake) were found to be more effective than Metformin in delaying and possibly preventing Type II diabetes in a study of 3,234 overweight people with impaired glucose tolerance (IGT), a precursor of diabetes. Where the diet and exercise regime achieved a 5 to 7% weight loss, it reduced the incidence of diabetes by 58% compared to 31% in the Metformin group, both at 3-year follow-ups. (*New England Journal of Medicine*, vol. 346:393-403).

## Diet

Caloric restriction leads to greater insulin sensitivity. Therefore, eating more nutritious foods and fewer refined carbohydrates; incorporating good fats into the diet; and eliminating unhealthy fats, can lower glucose and insulin levels and reduce glucose damage to the body. Studies at the University of Naples in Italy have shown that people who live past 100 were trimmer, had less body fat, and were less likely to have pot bellies than those in their 40s. Typically they ate five times as much vegetables. [Challem, Jack et al. *Syndrome X* (New York:John Willey & Sons, 2000) 37.]

Diabetics with syndrome X should emphasize fresh vegetables and fruits; use extra virgin olive oil for cooking, and flax or avocado oil for dressing; and avoid soft drinks, fruit juices, alcohol, fried foods (which contain trans-fatty acids) and margarine. Incorporating lean protein with every meal can help to stabilize blood glucose levels; particularly helpful are fish, including salmon; trout; tuna; sardines; herring; anchovies; and mackerel. Exercise has numerous health benefits and increases insulin sensitivity.

## Success with Natural Methods

Paying careful attention to one's symptoms; using a home glucose monitoring system; and a careful diet are all-important to success with natural therapies. The herbs mentioned below are all bioactive in pill form, which is more applicable for Americans in long-term treatment. For example, unripe bitter melon has a glucose lowering effect, but it must be taken as a fresh juice or daily decoction; therefore, it is not likely to be successfully used by American diabetics.

### Queen's Crepe Myrtle (*Lagerstroemia Speciosa*)

Corosolic acid is extracted from the Asian tree Queen's Crepe Myrtle (*lagerstroemia speciosa*). It is one of the more promising blood sugar regulating plants because a low dosage of the extract is still effective. Laboratory studies in Japan have indicated that corosolic acid is an activator of glucose transport and has a hypoglycemic effect when used orally. In a placebo-controlled study in Japan, patients with fasting glucose levels of 110 mg/dl were given a placebo or standardized Queen's Crepe

Myrtle tablets equaling 160 micrograms of corosolic acid; a statistically significant drop in blood glucose was seen in most patients. In an American study with ten Type II diabetic patients, average blood glucose dropped 31.9 percent after two weeks of administration of a preparation consisting of 480 micrograms of corosolic acid. When normal volunteers were given the same preparation, they were not affected in one study. In the other study, the equivalent of 240 micrograms of corosolic acid produced a hypoglycemic effect, but volunteers recovered to normal blood glucose levels in three hours. In the most recent study, a 60-day experiment was conducted on nine male and female Type II diabetics ages 37-72. Each participant was given 16 mg of Queen's Crepe Myrtle extract containing 1% corosolic acid in capsule form, three times per day, after each meal. Blood was drawn from the volunteers under fasting, and serum glucose levels were estimated using the enzymatic glucose oxidase/peroxidase method within 60 minutes of blood collection. The results showed an average reduction of 15% in fasting serum glucose levels within 15 days. Within 30 days, the average reduction was 19.96%; after 60 days, it was 22.08%. The results are almost identical to the first study, which lasted only 30 days and comprised eight volunteers. The first study resulted in an average reduction of 15% after 15 days and 19% after 30 days. All participants benefited from the use of Queen's Crepe Myrtle, with an average reduction of 22% [Challem, et al, 228].

### Ginseng

Ginseng has been used since ancient times as a treatment for diabetes symptoms. Although all ginseng species have hypoglycemic effects in laboratory models, American ginseng (*panax quinquefolium*) is the preferred species because it is cooling; generates fluids; and is traditionally used for thirst, fatigue and hunger. Empirically, it has been used to treat diabetes. At the University of Toronto, researchers conducted several studies testing the effects of American ginseng on glucose levels. Twelve healthy individuals received a placebo or one, two or three grams of American ginseng at various time intervals before a capillary blood and glucose challenge test was administered. Glycemia was lowest 40 minutes after dosages of American ginseng. According to the researchers, each dosage worked equally as well. Similar findings were observed in three additional human studies [Vuksan, Vladimir et al. American ginseng attenuates postprandial glycemia in a time-dependent but not dose dependent manner in healthy individuals. *American Journal of Clinical Nutrition*, Vol. 73, No. 4, pp. 753-758, April 2001]. The Toronto researchers concluded that American ginseng stimulates insulin secretion and improves nitric oxide-mediated uptake of glucose into cells. This may explain why non-diabetics get the best effect taking American ginseng 40 minutes prior to a glucose challenge.

### Milk Thistle

Milk thistle has been found to be beneficial in a wide range of liver disorders. Eighty percent silymarin extracts of milk thistle (for example, a 200mg capsule or tablet of milk thistle will have 160mg of silymarin) have been found to have antioxidant and glucose-regulating properties. In a study at Monfalcone Hospital in Groiza, Italy, 60 insulin-dependant diabetes took either 600 mg of silymarin or a placebo for 12 months. After the first month, in which fasting glucose levels were elevated, fasting glucose declined by 9.5 percent and average daily glucose dropped 14.9 percent among the treated group. In addition, glucosuria (sugar in the urine), glycosylated hemoglobin and insulin requirements declined significantly (Challem et al, 219-221).

### Stevia

Stevia, a South American herb, has glucose-lowering properties when taken in large dosages and is

considered a natural sweetener. It is sold in health food stores in dry leaf form, powder and alcohol tincture. The author has found stevia very useful in helping clients wean off of sugar and sugar substitutes.

## TCM Formulas

Although traditional Chinese formulas are very helpful at treating constitutional factors and various symptoms, they have not been widely studied for their glucose-lowering effects. Formulas such as *wu ling san* may be used to reduce water weight. Formulas such as the following astragalus formula [consisting of astragalus root and seed (*huang qi* & *sha yuan ji zi*); ligustrum (*nu zhen zi*); ho-sho-wu (*he shou wu*); lycium fruit (*gou qi zi*); rehmannia (*shu di huang*); eucommia (*du zhong*); cuscuta (*tu si zi*); ginseng (*ren shen*); tang kuei (*dang gui*); and cornus (*shan zhu yu*)] may be used to reduce night-time urination and have mild hypoglycemic effects. A lily bulb formula, made of lily bulb (*bai he*); rehmannia root (*shu di huang* and *sheng di*); ophiopogon root (*mai men dong*); fritillaria bulb (*chuan bei mu*); platycodon (*jie geng*); tang kuei root; peony root (*bai shao*); licorice root (*gan cao*); and scrophularia root (*xuan shen*), or a tremella & American ginseng formula, consisting of tremella (*bai mu er*); American ginseng (*xi yang shen*); astragalus; schizandra (*wu wei zi*); raw rehmannia; lycium fruit; lycium bark (*di gu pi*); isatis extract (*ban lan gen* & *da qing ye*); ophiopogon; lonicera (*jin yin hua*); viola (*zi hua di ding*); ganoderma (*ling zhi cao*); cuscuta; dendrobium (*shi hu*); milletia extract (*ji xue teng*); ligustrum; glehnia (*sha shen*); tang kuei; tortoise shell (*gui ban*); epimedium (*yin yang huo*); citrus (*chen pi*); curcuma (*yu jin*); licorice; and cardamon (*sha ren*) can be used for chronic thirst and dryness.

## Cautions, Contraindications and Conclusions

Before trying herbs, it is essential that diabetics be under the care of a knowledgeable health professional. In addition to glucose monitoring, it is imperative to emphasize exercise, stress reduction and the importance of diet, with an emphasis on fresh vegetable; fruits; lean protein; nuts and seeds; and eliminating refined foods. Be very cautious about products sold in Chinatown. as they may be adulterated with pharmaceuticals. Products sold in health food stores may contain the proverbial "kitchen sink" of glucose nutrients, yet not enough of any one ingredient to get a therapeutic effect.

The author has developed a formula with therapeutic amounts of Queen's Crepe Myrtle containing one percent corosolic acid and American ginseng. As this formula may lessen the need for diabetes medication, it is essential that clients and their practitioners monitor blood glucose carefully. The Queen's Crepe Myrtle and American ginseng formula may be combined with milk thistle, TCM formulas, or vitamins as desired.

Part two of this article will concern treating complications of diabetes with case studies.

DECEMBER 2002