

Treating Diabetes From A Nutritional Perspective – PART ONE

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IDENTIFYING THE PROBLEM

Diabetes, also known as hyperglycemia, has become virtually epidemic in America and other industrialized nations of the world. More than 135 million people worldwide have diabetes. The World Health Organization estimates that by the year 2025, 300 million people worldwide will have diabetes. Currently, some 16 million Americans have diabetes. From 1990 to 2000, the incidence of adult-onset diabetes increased 33% in the United States and by an incredible 70% among people in their 30's. The American Diabetic Association shows diabetes to be the fourth leading cause of death in America, resulting in 160 thousand deaths annually. Hundreds of thousands more suffer from multiple complications of diabetes such as heart disease, stroke, blindness and amputations. Between 1993 and 1995, 67,000 diabetes related amputations were performed and 28,000 cases of end-stage kidney disease were identified in 1995. Clearly, we have a major health problem relative to blood sugar metabolism.

DEFINING THE PROBLEM

What is diabetes and how does it develop. Simply put, a person is defined as diabetic if, when waking up in the morning; their blood glucose level is above 120 milligrams per deciliter (mg/dl) of blood. Some health care professionals feel that any fasting blood sugar above 100 mg/dl is diabetic. After you eat a meal, glucose levels will initially raise and then slowly fall as carbohydrates are digested and turned into glucose. Doctors call this your postprandial (post-meal) curve. The normal peak in this curve should be around 139 mg/dl. Higher postprandial glucose levels can be indicative of diabetes.

There are two types of diabetes. Juvenile-onset diabetes occurs at a very early age, when the pancreas stops making the hormone insulin. Insulin must then be injected to facilitate the processing of

glucose from the blood into the cells. Adult-onset diabetes, which is the most common type of diabetes, occurs when cells of the body gradually become resistant to insulin, resulting in elevated glucose levels. With adult-onset diabetes, the pancreas is often producing adequate amounts of insulin but the cells are not accepting that insulin. Eventually, the pancreas can become weakened and no longer produce adequate amounts of insulin. This can lead to the need for oral or injectable insulin and other pharmaceuticals to control blood sugar levels.

Adult-onset diabetes can largely be traced to the over consumption of refined carbohydrates. Such carbohydrates are broken down quickly into glucose in the digestive process and require large amounts of insulin from the pancreas. After a while, the cells become insensitive to insulin and even more insulin is required from the pancreas to facilitate the transfer of glucose to the cells. Elevated insulin and elevated glucose can lead to a host of health problems. Elevated glucose levels generate large numbers of free radicals which damage tissues and lead to accelerated aging. Excess glucose can also react with, and damage the body's proteins. The bi-products of these reactions include advanced glycation end-products abbreviated as AGEs. AGEs involves glucose fusing with protein. This fusing damages body tissue in much the same way as over-cooking toughens a steak. AGEs contribute to heart disease by increasing the oxidation of LDL cholesterol and creating cross-links in the proteins forming blood vessel walls. This causes aging of the blood vessels, making them less flexible.

Because excess glucose creates excessive free radicals and damaged protein, this condition can have devastating effects on the entire body. Excess glucose leads to increased levels of both cholesterol and triglycerides. It leads to blood platelets

becoming more sticky, increasing the risk for greater blood clotting. Excess glucose interferes with blood circulation which leads to poor wound healing and deterioration of organ systems such as the kidneys. Because of its damaging effect on the circulatory system, high glucose levels can lead to diabetic retinopathy which is damage to the retina of the eyes. This can lead to loss of eyesight and blindness. Restriction of blood flow can cause diabetic neuropathy which is nerve damage. Diabetic neuropathy can produce numbness, pain and even lead to amputations due to the dying of tissue.

Insulin resistance results in the pancreas producing excessive insulin to deal with the excessive glucose levels in the blood. This excessive insulin has its own damaging effects. It can negatively affect the behavior of endothelial cells which line the walls of the arteries and therefore affect the health of the heart. There is substantial evidence that elevated levels of insulin increase the risk of colon, liver, pancreatic, breast and endometrial cancer. High insulin causes retention of sodium which causes retention of fluids. This fluid retention can lead to high blood pressure which can lead to heart problems. Insulin mediates blood fats and high insulin can result in elevated triglyceride levels.

SOLVING THE PROBLEM

Since a high glucose level in the blood is such a serious threat to the health of the body, it is imperative that this condition be addressed. There are several areas that must be considered. The most important area is diet. The standard American diet is largely responsible for adult-onset diabetes. Simple and refined carbohydrates make up a large segment of the typical American diet. It is these types of carbohydrate that are broken down quickly into the simple sugar glucose by the digestive process. This results in the need for large amounts of insulin →

being released by the pancreas to facilitate the transfer of glucose from the blood into the cells.

White sugar, also known as sucrose, is a primary example of a simple carbohydrate. White sugar is made of a chain of the two sugar molecules glucose and fructose. This is called a disaccharide (di meaning two and saccharide meaning sweet). This is a very simple carbohydrate which breaks down very quickly in the digestive process. Many foods will naturally contain disaccharides such as sucrose. The problem comes in when sucrose, fructose and other simple sugars are added to foods. The addition of these sugars to foods greatly increases the amount of these simple sugars that we ingest. Up to 25% of the standard American diet is simple sugar. For teenagers, it's much higher.

White bread is a good example of a refined carbohydrate. The making of white bread begins with whole wheat grain. This grain has complex carbohydrate called starch.

This starch is composed of long chains of sugar molecules called polysaccharides (poly meaning many). After removing the bran (the fiber part of the wheat), and the germ (the part that contains most of the vitamins and minerals), this grain is then ground into a very fine flour. Because of the very small particle size of this flour, it is easy for water to be absorbed. This adsorption of water greatly expands the surface area of each particle. This expansion makes it easy for enzymes to break down this flour in the digestive tract. The removal of the fiber from the grain contributes further to its gelatinization. Gelatinization is where water and heat expand the starch granules to where there is created much larger surface areas to which digestive enzymes can attach and, therefore, speed up the process of breaking down the polysaccharides into disaccharides and finally into the monosaccharides of glucose, fructose and galactose (mono meaning one).

Even though the grain from which the

white bread is made is a starch, and therefore, a more complex carbohydrate, because of the manner in which it is processed into fine flour, this carbohydrate breaks down quickly in the digestive process. This leads to an abundance of glucose which requires insulin to transfer it from the blood into the cells. Many of the foods Americans eat are made from refined flours, including many bakery products, pastas, breakfast cereals and snack foods. When you combine these refined flour products with the large amount of the simple sugar sucrose that is added to many of these products, you can easily see why diabetes has become the health problem that it is.

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In part two, we will look at additional dietary factors that relate to the control of blood sugar. Visit www.milkandhoneyhealthfoods.com for comprehensive articles on many aspects of health and nutrition.