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Metabolic Syndrome and Glycemic Index

Metabolic syndrome is a cluster of cardiovascular risk factors for a single individual.

Type 2 diabetes (acquired), increased blood fat (triglycerides), increased cholesterol (LDL or decreased HDL), increased blood pressure, obesity (intraabdominal type)

This is also a contested issue in medicine and a lot of people call it by other names including syndrome X, Insulin Resistance Syndrome, etc. There is another component which is inflammation of the tissues. This is measured with an increase in the enzyme homocystine and also with another test called C-reactive protein. Another test is called serum Amyloid A (SAA)

When sugar intake is too high from diet, the body has to produce more insulin to clear the sugar. This leads to an inevitable crash in energy and the body again craves sugar to boost energy resulting in a yo-yo effect.

Insulin lowers blood sugar by pushing it into your cells where it gets burned up as energy. Diabetes occurs when your pancreas can't make enough insulin to get the job done. By then, both your insulin and blood sugar levels are too high. Even before diabetes happens, there's a period of time, often years, where your blood sugar may look normal but you are making too much insulin for your own good. High levels of insulin suppress your blood sugar levels. Inflammation in your body is one indicator that this chemical change is going on. Your body's cells try to resist insulin's efforts to push sugar into them from your blood. This is called 'insulin resistance'. Although there is a genetic component for this problem, the main causes are a lousy diet, excess body weight and too little physical activity.

High insulin levels even in the presence of 'normal' blood sugar levels are a menace: They contribute to the formation of atherosclerotic plaque, making it more likely that you will develop artery blocking clots. They also make you retain water and sodium, which elevates blood pressure and boosts blood triglyceride levels adding to your risk of heart disease.

When blood sugar is too low, the adrenal glands secrete the hormone cortisol and the pituitary glands secrete adrenocorticotrophic hormone, both of which in turn stimulate the liver to release glycogen (in the body, sugar is converted and stored as glycogen).

In healthy people, this system works great, but in people under chronic stress, poor diet, etc, the swings can create problems.

There is also an intricate interplay between insulin and cholesterol. Although cholesterol is an important molecule in your body, working to both make and repair cell membranes and as a building block for hormones, when inflammation occurs, it instigates cholesterol to misbehave.

Niacin will lower the levels of the large (LDL) particles and lower the triglyceride levels and will raise HDL (smaller than LDL) (good cholesterol). Fish Oil, diet and exercise can normalize triglyceride levels as well.

One more tool in the box is to reduce the intake of foods that require more insulin for digestive breakdown into energy. This way of looking at your life is to use the so called 'glycemic index'. The glycemic index is the blood glucose response to a given food, and is usually calculated by measuring the blood sugar of test subjects who are fasting, feeding them a measured amount of a test food, and then retesting the blood two to three hours later. This number is adjusted to an equal amount in weight of the reference food. The glycemic index is the newest way to classify carbohydrate-rich foods previously categorized as either simple or complex, or as sugars or starches. The rub with the glycemic index foods is that the labs measuring these foods are all different and there are many different samples of the same products. Even the amount of chewing that you do is important. If you do not chew your food well, the GI is going to be higher.

Low glycemic diet foods show improvements in insulin sensitivity in patients at risk cardiovascular disease (metabolic syndrome). There are definite improved blood fat profiles (triglycerides) and elevated good cholesterol (HDL) as well as weight loss.

The glycemic index (GI) is a ranking of carbohydrates on a scale from 0 to 100 according to the extent to which they raise blood sugar levels after eating. Foods with a high GI are those which are rapidly digested and absorbed and result in marked fluctuations in blood sugar levels. Low-GI foods, by virtue of their slow digestion and absorption, produce gradual rises in blood sugar and insulin levels, and have proven benefits for health. Low GI diets have been shown to improve both glucose and lipid levels in people with diabetes (type 1 and type 2). They have benefits for weight control because they help control appetite and delay hunger. Low GI diets also reduce insulin levels and insulin resistance. The foods which are lower or medium in the load index are going to be easier to digest with less fluctuation. The commonly accepted numbers are usually High at 70 and above, Medium at 56-69 and Low at or below 55.

One way to use this glycemic index without making yourself crazy is to substitute high glycemic foods with low glycemic foods. Some tips are as follows:

Use breakfast cereals based on oats, barley and bran

Use breads with whole grains (stone ground flour, sour dough, whole rye)

Reduce the amount of potatoes that you eat

Enjoy all other types of fruit and vegetables

Use Basmati rice

Eat pasta, but the type made from whole grains

Salad vegetables are fine with a vinaigrette dressing.