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Progression to Diabetes: Hyperinsulinemia and Beta Cell Fatigue
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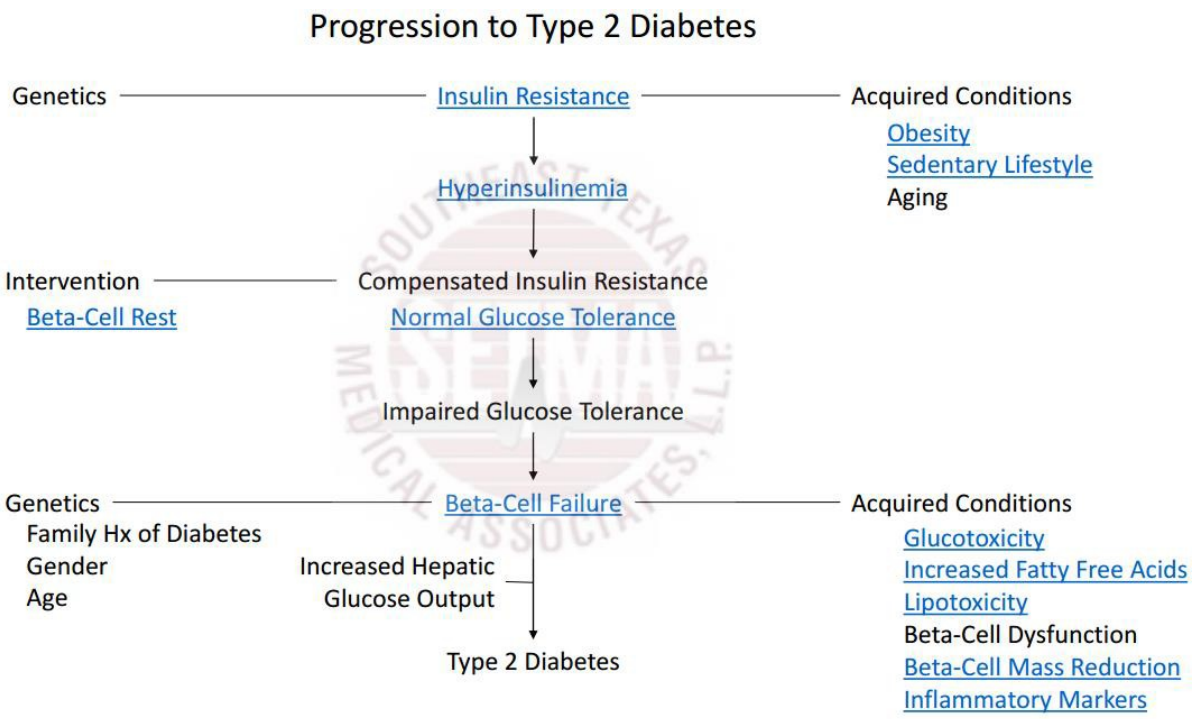
When the liver, muscles and fat cells do not respond as they should to insulin, the first step of a serious metabolic disorder has begun. The good news is that if you understand this, something can be done about it. Don't ever forget: the best way to treat diabetes is "don't get it." With Type I Diabetes that is not a choice that a person has, but with Type II Diabetes, it is often possible to avoid the disorder, to reverse the progression to the disorder, or to delay the development of Type II Diabetes.

Don't ever forget Dr. Elliott Joslin's – the Founder of the Harvard University's Joslin Diabetes Center – famous statement: "The person who knows the most about diabetes will live the longest." Knowledge, in this case, is power and that power is the ability to maintain or to regain your health.

Remember the "road map" of Progression to Type 2 Diabetes.



Once a person's body has developed insulin resistance as we discussed last week, the body tries to compensate by increasing the production of insulin which will produce a state called "hyperinsulinemia."

Inside the pancreas, beta cells make the hormone "insulin". With each meal, beta cells release insulin to help the body use or store blood sugar (glucose) it gets from food. Don't forget this point; it is key to our entire discussion. Insulin helps the body USE the sugar received during a meal or snack, or helps the body STORE the sugar which is not needed for immediate energy demands. "Use" means creates energy for activity; "store" means FAT!!!

You can already begin to see how important this balance is. If you "take in" more sugar than you use in activity, you will gain weight due to sugar stored as fat. This is not unlike your check book. If you deposit a hundred dollars, but you spend $!50, you will be "overdrawn." In the same fashion, each day you receive a deposit to your body from your meals. That deposit represents the number of calories you need to eat that day to maintain your current weight. If you eat more than that, you will gain weight - you will overdraw your calorie account.

I Didn't Eat Sugar!

But, many people will say, "I didn't eat any sugar with my meal, where does the sugar come from?" It comes from all of the foods you eat. In order to utilize the nutrients you eat, they are metabolized by your body into sugar. Some foods go to sugar rapidly and contribute to hyperinsulinemia. These foods have a high "glycemic level," because they rapidly turn to sugar. That is why we can say that eating cooked potatoes is like eating a "lump of sugar." Cooked potatoes are turned to sugar almost as fast as processed, granulated sugar is absorbed into the

blood stream. Other foods are turned to sugar very slowly and do not contribute to hyperinsulinemia. These foods have a low "glycemic level."

Carbohydrates – fruits and vegetables -- which are fibrous have a low glycemic level and do not contribute significantly to elevations of your body's blood sugar levels or of insulin levels.

Comfort Food - Addiction to Carbohydrates

Most of us are addicted to sugar and to carbohydrates. That is why they are often called "comfort foods." We "feel" better after eating them; they "comfort" us. However, what they are doing to our health is not comforting! If you don't believe that you are addicted to sugar and carbohydrates, stop eating any sugar and carbohydrates for one week. You will see that you'll be grumpy and irritable. If you continue to modify your diet and eat less and less high-glycemic carbohydrates, however, your body will adjust. You will feel better, be better and you will not miss your "carbohydrate fix" at each meal or snack.

Keep Moving

Yet, there is a way to "take care of a carbohydrate load." Activity!!! Moving around!!! Walking, working, and exercising! When you are active, the peaks of blood sugar are much less than if you are sedentary. Therefore, the insulin response and the level of circulating insulin is lower. People who are active generally do not develop insulin resistance in the liver, the muscles and the fat cells and you do not get fat. Also, muscle uses more sugar for its activity than other body organs and so the more active your muscles are the more sugar you burn. And, when you "run out of sugar" to burn, your body starts to burn fat. That's how you lose weight.

If healthcare providers could get one message across to patients it would be to stay mobile. Keep moving. You should take 10,000 steps a day in order to maintain cardiovascular fitness and to maintain the aerobic capacity of your heart. It would be a good idea to get a counter and wear it to see how many steps you are taking. You can increase your number of steps without planned activity:

1. By walking up stairs rather than riding elevators.
2. By parking farther away from your destination than usual and walking further.
3. By walking to where you are going if it is only a few blocks.

You would be amazed at how you can increase your activity level if that is your goal. Above all, resist scooters and motorized wheelchairs which take away all of your steps. If you have a medical condition which absolutely demands that you have a wheelchair, then you can deal with your need for activity in other ways, but don't let anyone put you into a wheelchair or a scooter until it is absolutely the very last resort.

Elevated Insulin Levels - Hyperinsulinemia

Some of the symptoms of hyperinsulinemia, or “reactive hypoglycemia” include:

1. Yo-yo weight gain,
2. cravings especially for sugar or high glycemic foods,
3. intense hunger,
4. weakness,
5. shakiness,
6. the need for frequent meals,
7. poor concentration,
8. emotional instability,
9. memory disorders,
10. lack of focus,
11. feelings of anxiety & panic,
12. lack of motivation,
13. fatigue
14. a host of other symptoms.

Elevated insulin levels are associated with stress, anxiety, smoking, weight gain and poor concentration. It is also connected to the development of a number of family-related diseases such as:

1. Heart and circulatory disorders
2. High cholesterol
3. Stroke
4. High blood pressure
5. Even certain cancers
6. PMS
7. A host of other physiological problems including
8. Acne

In children as well as adults, hyperinsulinemia causes cardiovascular disease, obesity, Type II Diabetes, and has been linked to ADD, ADHD, food allergies, learning and behavior problems, and juvenile delinquency. Other deleterious effects of hyperinsulinemia are increased rates of infertility, polycystic ovarian syndrome (PCOS), and hormonal imbalances in women. If all that were not enough, hyperinsulinemia also accelerates the aging process.

The foods which contribute to hyperinsulinism are:

1. Fruit Juices
2. Coffee
3. Junk Food
4. Artificial Sweeteners
5. Sugar
6. Breads
7. Vegetarian diets
8. Cakes and cookies
9. Dried Fruit
10. Sweets

11. Soft Drinks
12. Pasta
13. High complex carbohydrate/ low protein diets.

Beta Cell Fatigue

When we eat high glycemic foods, which rapidly turn into sugar in the blood, the pancreatic beta cells are pressed to produce more insulin. There comes a time when beta cells can no longer keep up with the demands for more and more insulin. This is called “beta cell fatigue” which pushes us closer and closer to full blown diabetes.

The solution is “beta cell rest.” Decreasing the pressure on the pancreas to produce more insulin can begin reversing the progression to diabetes. “Beta Cell Rest” is achieved by:

1. Weight loss
2. Exercise
3. Low Glycemic foods

Next week, we will continue our study of the Progression to the development to Type II Diabetes as we examine beta cell failure and the toxic effects of the many of the consequences of metabolic disorders.