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Preventing Diabetes
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As we have examined the progression to diabetes, we have looked at the causes of diabetes, how we will your personal risk of developing diabetes and how to prevent it.

There are six risk factors for developing Type 2 Diabetes Mellitus. There is a seventh in females. SETMA has devised an electronic method for assessing your risk every time you see your healthcare provider and a summary of your risk can be given to at the time of your visit.

Because the most important risk factor is being overweight, SETMA's Diabetes-Prevention-Program document begins with the following statement: "10-15 pounds of excess weight places a person at a higher risk for developing diabetes, but 10-15% decrease in weight, even if a person is obese, decreases that risk significantly." This statement continues, "The bad news is that more people are at greater risk of developing diabetes than think they are, but the good news is that a person can help decrease their risk without attaining their ideal body weight."

The document then tells you how many pounds you are over your ideal body weight and how many pounds (10-15% of total body weight) you need to lose, in order to decrease your risk of developing diabetes.

The six factors which increase your risk of developing diabetes are: family history, hypertension, elevated cholesterol, overweight/obesity, low birth weight, non-Caucasian ethnicity and in the case of females a seventh which is gestational diabetes or diabetes during pregnancy.

Remember, these are "risk factors," which means one or more of these factors increase your chances of developing diabetes but none of them determine that you will have diabetes. Even having a parent with type 1 diabetes does not mean that you will develop diabetes but it does increase your risk.

Overweight/Obese

Perhaps the most important risk factor for the development of diabetes and also the most correctable factor is being overweight. The twin epidemics of obesity and diabetes are expected to reduce life expectancy in the not so distant future. Obesity afflicts 300 million people worldwide, and an estimated 194 million have diabetes. The total number of people with diabetes is projected to hit 366 million by 2030. The number of Americans with diabetes is expected to almost double from 18.2 million in 2003 to 30.3 million in 2030.

The United States ranks third behind India and China in the incidence of diabetes. When you realize that almost one third of the people in the world who are overweight or obese live in the United States, you see what a public health problem this is in this country. Also, if you look at the dietary habits of the three countries which have the highest incidents of diabetes, India, China and the United States, you see that a high, non-fibrous carbohydrate diet contributes considerably to weight gain and the risk of diabetes. Non-fibrous carbohydrates include rice, white bread, cereal, and potatoes. Another way of saying this is foods which are "white."

Until recently adipose (fat) tissue was once regarded as a passive, storage depot for lipids. Science has now determined that the fat cell is a highly active and complex gland. Alterations in adipose tissue metabolism in obese individuals may be the missing link between insulin resistance - the inability of the muscle, live and other tissues to respond properly to insulin - and cardiovascular disease.

Adipose tissue (fat cells) secretes a number of substances which have a negative impact on health, which:

1. dampen the effect of insulin
2. impair glucose utilization in skeletal muscle
3. promote glucose production by the liver
4. impair insulin release by pancreatic beta cells

Weight loss through diet and exercise is the best approach to reduce visceral fat; fat around the liver and other organs in the body. However, decreasing adipose tissue mass alone will not improve metabolic abnormalities associated with obesity. When subcutaneous abdominal adipose tissue was removed by liposuction in obese women with normal glucose tolerance and women with diabetes, there were no significant changes in either group regarding the fat cells production of the substances which harm one's health.

Clinical trials have demonstrated that more than half of new cases of diabetes could be prevented through simple lifestyle changes. The most effective ways to prevent diabetes are to maintain:

1. A body mass index (BMI) under 25 kg/m2 (optimal BMI is between 21 and 23 kg/m2) – your healthcare provider should calculate your BMI each time you are seen.
2. To exercise at least moderately for 30 minutes a day – this includes a brisk walk or slow jog

When overweight people in a diabetic prevention program: lost 7% to 10% of their body weight and began taking half-hour walks 5 days a week, they decreased their risk of developing diabetes by 58%.

Low Birth Weight

If your birth weight was less than 2,500 grams (5 pounds 9 ounces), you are at a higher risk of developing diabetes. Those who were underweight at birth and become overweight in middle age have the most severe insulin resistance and the greatest risk of Type 2 Diabetes Mellitus, possibly because intrauterine growth restriction leads to inadequate pancreatic development. At all ages, the risk of impaired glucose tolerance, or Type II Diabetes Mellitus rises with increasing body weight.

Blood Pressure

If your blood pressure is greater that 130/80, you are at a higher risk of developing Type II Diabetes Mellitus. The reasons for this are not totally clear but it is well established that one of the causes of treatment-resistant hypertension is insulin resistance. All of the elements of insulin resistance contribute to inflammation in the arteries, to increase blood clotting and to arterial constriction. Each of these increases the probability of the development of hypertension and is benefited by the decreasing of abdominal fat which decreases the production of the substances which harm the body.

Abnormal Lipids

Lipids are cholesterol, triglycerides, high density lipoproteins (HDL) and other particles in the blood which contribute to heart and vessel disease. The classification of lipid disorders is complex but if you have Fredrickson's classification IIa, IIb or III you have a significant risk of developing heart disease and each of these abnormalities and others are both associated with the development of Type 2 Diabetes and are worsened by Type 2 Diabetes. You should know whether you have a lipid abnormality and if you do, you should know what type you have. Typically, a type IIa, IIb or III will require medication to effectively treat and that treatment will often last a life time to be effective.

You have an increased risk of diabetes due to lipids, if your:

- Cholesterol is over 150
- HDL is below 40
- Triglycerides are above 150

In which case, you need to institute life-style changes to improve each and/or you need to begin medication if life-style fails to reach the desired goals. If your lipids are abnormal, in order to eliminate disease risk, your:

- Total cholesterol should be treated to reach a level below 120,
- HDL above 40 and

- Triglycerides below 90.

Another lipid particle which is very important is called low density lipoprotein (LDL) and it should be treated to reach a level below 70.

Conclusion

The prevention of Type 2 Diabetes is potentially accomplished by affecting each of these seven factors. Obviously, there are several factors which you cannot change:

1. Family history
2. Birth Weight
3. Ethnicity
4. Gestational Diabetes

These four simply alert you to the fact that you must pay special attention to the three factors which can be changed.

There are three factors which can be changed:

1. Weight
2. Blood pressure
3. Lipids

The last two can be affected with medication, but the most important way to change your blood pressure and your lipids is the same way that you can change your weight:

- Exercise
- Dietary modification

This brings us to SETMA's LESS Initiative which we will discuss next week.