Lifewire: Genetic breakthrough could benefit those with Type 2 diabetes

by Amy Winter

A joint English-Canadian research team has discovered genetic markers that can identify people predisposed toward developing Type 2 diabetes.

The group believes these discoveries will help them to understand up to 70 percent of the disease's genetic background, and can help prevent people from developing Type 2 diabetes, the most common form of the disease.

The research is published online in the journal Nature.

Led by scientists from Imperial College London and Canada's McGill University, researchers from several international colleges identified the genetic structure of this disease. Four points on these genetic maps show the risk a person has in getting Type 2 diabetes.

"Until now, progress in understanding how genes influence disease has been painfully slow," said study co-author David Balding, professor of genetical statistics at Imperial College. "This study is one of the first large studies to report results using the new genome-wide technology that governments and research charities have invested heavily in during the past few years."

Researchers found one mutation that might help provide new treatments. This mutation is called SLC30A8; it is a specific zinc carrier that assists with insulin secretion. The research group theorizes that repairing this carrier could treat Type 2 diabetes.

"The two major reasons why people develop Type 2 diabetes are obesity and a family link," said Philippe Froguel, of Imperial College's division of medicine. "Our new findings mean we can create a good genetic test to predict people's risk of developing the disorder."

There are 20.8 million children and adults in the United States, or 7 percent of the population, who have diabetes, according to the Centers for Disease Control and Prevention in Atlanta. An estimated 14.6 million Americans have been diagnosed with diabetes. Unfortunately, 6.2 million are unaware they have the disease.

Froguel believes that if individuals know they are more likely to get diabetes, they might be more encouraged to change their lifestyle.

"If we can tell someone that their genetics mean they are predisposed toward Type 2 diabetes," said Froguel. "They will be much more motivated to change things such as diet to reduce their chances of developing the disorder. We can also use what we know about the specific genetic mutations associated with Type 2 diabetes to develop better treatments."

Type 2 diabetes occurs when sugar collects in the blood instead of the cells, according to the American Diabetes Association Web site (www.diabetes.org). Type 2 diabetics make insulin, which takes glucose from the blood to the cells; however, their bodies do not react properly to it.

Hyperglycemia and hypoglycemia are two of the problems associated with Type 2 diabetes.

Hyperglycemia is a scientific way of saying your blood sugar is too high. It occurs when the body fails to produce enough insulin or can't process the insulin it produces in the correct way.

In order to control hyperglycemia, diabetics must routinely monitor their blood sugar. When they need to reduce their blood sugar, exercising and modifying their eating habits to reduce sugar, high-fructose corn syrup and reducing portion size can help. If hyperglycemia isn't controlled, a disorder called ketoacidosis or diabetic coma can occur, says the ADA. This condition causes the bodies of diabetics to produce energy by breaking down fats instead of glucose for energy.

Symptoms of hyperglycemia are:

- The need to urinate more often

- Increased levels of sugar in the urine

- High blood sugar

On the other hand, hypoglycemia is the scientific way of saying your blood sugar is too low. Hypoglycemia is also known as "insulin reaction," says the ADA.

Hypoglycemia can be treated by routinely monitoring blood sugar levels. In order to raise sugar levels, a diabetic needs to consume some type of sugar, such as the fructose found in fruit juice.

Symptoms of hypoglycemia are:

- Dizziness.

- Hunger.

- Shaking.

- Sweating.

Type-2 diabetes leads to other complications if not treated. According to the ADA, these problems are:

- Heart disease and stroke.

- Kidney failure.

- Neuropathy, or damage to the nerves in the feet.

- Depression.

- Skin problems affect one-third of diabetics.

Type 2 diabetes can be prevented through a healthy diet and more exercise. A recent large, double-blind diabetes prevention program study performed by the ADA found diabetics who exercised 30 minutes a day and lost 5 percent to 10 percent of body weight decreased their diabetes symptoms by 58 percent.

A healthy diet designed to prevent Type 2 diabetes would include three to five daily servings of fruits and vegetables, whole-grain foods, fish two to three times a week and nonfat dairy products. Sugary desserts and candy should be kept to a minimum. People wishing to lower their risk of developing diabetes should also limit their intake of beverages that contain alcohol, sugar or high-fructose corn syrup in favor of diet drinks or water.

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