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Genetics and Weight Loss: Part 1

In the beginning of the year, I said that I would talk about several genes that may affect weight loss. It's time. One of the reasons it took so long is that it was some mind-numbing reading; normally I enjoy digging through research, but genetics is a whole different ballgame. With so many emails and voicemails to answer, I would rather do something interesting like communicate with you than read genetic-research papers that put me to sleep in five minutes. But I'm done with the first batch, so it's time to get to it.

Background

Genetic testing is becoming more common. There are genes that your doctor can test for diseases such as celiac disease and Down's syndrome. There are also genetic tests that look for variations in genes that we'd all like to have—genes that control inflammation, control our ability to exercise, and control how much we'll benefit from the exercise. There are also genes that control the way we metabolize fat and carbohydrates. The variations in these genes are called polymorphisms. We all have the same gene, but we may have different versions of the gene because of changes to our DNA over generations. That means we may respond differently when exposed to the same circumstances.

For example, if we both eat the same diet, our bodies might respond differently in how we process the nutrients. I may process fat better than you do, but you might process carbohydrates better. Since the equipment to process DNA has become more available, scientists have been trying to find out what genes and variations are associated with being overweight.

The problem is that it's not quite as simple as finding one gene. For example, when you start to exercise, 10,000 genes, give or take, are expressed or turned on. When you stop, they're all down-regulated with the exception of those genes that benefited from the training; if you did a 30-minute walk, those genes that produce enzymes to help your body use oxygen may keep producing those enzymes for a while so that you have an increased supply the next time you exercise.

The same thing is true for genes that process nutrients, control our hunger, store fat, and thousands more genes that all can have some impact on our body weight. Even more important, they can affect our ability to lose excess weight. Just like with exercise, some genes act normally until we gain excess body fat and then they become activated and stay that way. It doesn't mean that losing weight is impossible. But if you know what versions of genes you have, you can play to their strengths or weaknesses to make weight loss more effective. In this message, I'll talk about two genes that are related to our ability to process fat. Please understand that I'm not a geneticist—I'm going to give you the most simplified explanation of what these genes do and what role they can play in controlling your weight.

PPAR Gamma

That stands for peroxisome proliferator-activated receptor gamma. The variation in this gene has been related to adipocyte differentiation, obesity, insulin resistance, and risk of type 2 diabetes (1,2). Adipocyte what? In effect, this gene (among others) can control whether new fat cells are made. Some studies have indicated that variations in this gene have been associated with increased body fat, but it doesn't mean that everyone who has this genetic variation will become obese (3).

Based on the way I read the research, this gene acts differently when a person is normal weight than when someone is overweight. This is an oversimplification but when a fat cell is full, PPAR Gamma wants it to stay full. It will affect hunger and lipid metabolism so as to protect the cell from losing fat. Another way of looking at this is as a thrifty gene (4); when food is plentiful, it will help keep those fat cells full so your body has energy to draw on when there's a famine. The problem is that we live in a country that hasn't seen a famine for a good long while. The gene, however, keeps doing its job—we store fat and keep it.

FABP2

FABP2 stand for fatty-acid binding protein. It's found in fat cells and has an affinity for long-chain fatty acids; it seems to affect fat deposited in the belly area, may help decrease metabolic rate, and contribute to insulin resistance (5). People with the genetic variation may selectively metabolize fat differently from people who don't, resulting in increased fat storage when dietary fat intake is high. I say *may* because the data are not clear. In one study, people with the normal gene and variation both lost similar amounts of weight when on the same diet plan of 1,500 calories per day (6).

The effects of the genetic variation with FABP2 are more clear than PPAR Gamma. Still, research shows that many people who aren't overweight have the genetic variation associated with obesity. That leads me to believe that staying lean keeps this genetic anomaly under control. Once you're overweight, it may work against you unless you select the type of diet most likely to keep the genes under control.

The Bottom Line

PPAR Gamma and FABP2 work at the level of the fat cell and respond to dietary fat once a person is overweight. The way to overcome this gene? Eat a low-fat diet. If there's little dietary fat available, the genes may become down-regulated over time. It may also be wise to use more monounsaturated fats such as olive oil and polyunsaturated fats such as canola and peanut oil, rather that saturated fat such as butter and vegetable oil.

Before you ask, Paula and I have our genetic test results, but I'm not going to reveal my genetic pattern until I'm done writing about the genes. That still gives you time to get your genetic test completed. Check out Inherent Health's website through your business or directly online.

What are you prepared to do today?

Dr. Chet

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