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Genetics and Weight Loss: Part 2

This is a continuation of the topic, genetics and weight loss, from last Saturday's message. If you didn't read it, go back and check it out, because it contains some background material that I don't want to repeat. What I will repeat is this: 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. This isn't exactly cause and effect—there are many genes involved in weight loss. But if you know how you process energy, you can eat to be consistent with your genes and that may help you lose the weight you want to lose—especially that last 30 pounds.

ADRB2

ADRB2 stand for beta-2 adrenergic receptor; the term adrenergic receptor means that it will respond to classes of hormones called catecholamine. The old terms were adrenaline and noradrenalin, but today they're called epinephrine and norepinephrine. There are many polymorphisms (mutations) of this gene, but two are associated with obesity and insulin resistance: the GLU 27 and the GLY 16 alleles. Alleles are alternative forms of genes that can occupy the same space on a chromosome.

When this gene is expressed (turned on) in fat cells, it releases free fatty acids in response to epinephrine. The fatty acids could be used as fuel during aerobic exercise. However, the fatty acid release also means that insulin action will be affected and will increase the deposit of triglyceride, another form of fatty acids, into fat cells particularly in the abdominal area. There are many questions yet to be answered about how this works. Why is epinephrine released? Is the rate of release higher in people who are overweight? Is it released in response to overeating? Why does insulin cause more fat to be deposited? That question may be partially answered by what we eat.

Several studies on these genetic variations have shown mixed results. In some cases, these polymorphisms are associated with obesity and insulin resistance while in other cases, they aren't (1-5). The polymorphism may be race specific—Caucasians are more susceptible to variations in this gene, which contributes to obesity. However, it may also be gender specific—men seem to have increased insulin resistance and a higher rate of obesity than women (6,7). Or it may not (8). Confused? I was, but here's a study that may clarify things.

Researchers examined the genetic variation between obese women and those of normal weight (9). Just like in the studies mentioned above, they didn't find any specific pattern that would say, "If you have this gene variation, you're going to be fat." But when they looked at dietary intake, there was a pattern. The women who had the GLU 27 allele and had a high carbohydrate intake had the greatest risk of being obese. How high? If over 50% of their food intake was carbohydrates, they were more likely to be obese. The researchers concluded that the diet choices of people with the genetic variation explained why other studies were so murky. One study doesn't mean cause and effect, but it's the most powerful explanation to date for these gene variations and their relationship to obesity.

The Bottom Line

ADRB2 is a complex gene, as we've seen. Yet, if you have the genetic variation, whether you become overweight or whether you can effectively lose weight once you've gained it may depend on your carbohydrate intake. While the study didn't tease out specifics of the diet, it may be that people who eat more refined carbohydrates have a more difficult time losing weight and keeping it off. If you have this mutation of this gene, it may be wise to reduce

your carbohydrate intake. But we're not done with this gene yet because it also has a role to play in what type of exercise may be most effective for you. That will be the topic of next Saturday's message.

Just to remind you, 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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