Study finds why drug for type 2 diabetes makes people fat

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This is an image of a weight scale. Credit: CDC/Debora Cartagena

Medication used to treat patients with type II diabetes activates sensors on brain cells that increase hunger, causing people taking this drug to gain more body fat, according to researchers at Georgia State University, Oregon Health and Science University, Georgia Regents University and Charlie Norwood Veterans Administration Medical Center.

The study, published on March 18 in *The Journal of Neuroscience*, describes a new way to affect hunger in the brain and helps to explain why people taking a class of drugs for type II diabetes gain more body fat.

Type II diabetes, the most common form of diabetes, affects 95 percent of diabetes sufferers. People with type I or type II diabetes have too much glucose, or sugar, in their blood. Type II diabetes develops most often in middle-aged and older adults and people who are overweight and inactive, according to the National Institute of Diabetes and Digestive and Kidney Diseases.

The research team found that sensors in the brain that detect free circulating energy and help use sugars are located on brain cells that control eating behavior. This is important because many people with type II diabetes are taking antidiabetics, known as thiazolidinediones (TZDs), which specifically activate these sensors, said Johnny Garretson, study author and doctoral student in the Neuroscience Institute and Center for Obesity Reversal at Georgia State.

The study found peroxisome proliferator-activated receptor ϒ (PPARϒ) sensors on hunger-stimulating cells, known as agouti-related protein (AgRP) cells, at the base of the brain in the hypothalamus. Activating these PPARϒ sensors triggers food hoarding, food intake and the production of more AgRP. When AgRP cells are activated, animals become immediately hungry. These cells are so potent they will wake a rodent up from slumber to go eat, Garretson said.

TZDs help to treat insulin resistance, in which the body doesn't use insulin the way that it should. They help the body's insulin work properly, making blood glucose levels stay on target and allowing cells to get the energy they need, according to the National Institute of Diabetes and Digestive and Kidney Diseases.

"People taking these TZDs are hungrier, and they do gain more weight. This may be a reason why," Garretson said. "When they're taking these drugs, it's activating these receptors, which we believe are controlling feeding through this mechanism that we found. We discovered that activating these receptors makes our rodent animal model eat more and store more food for later, while blocking these receptors makes them eat less and store less food for later, even after they've been food deprived and they're at their hungriest."

Provided by Georgia State University