Gene therapy shows early promise for treating obesity

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With obesity reaching epidemic levels, researchers at the Ohio State University Medical Center are studying a potentially long-term treatment that involves injecting a gene directly into one of the critical feeding and weight control centers of the brain.

"Obesity significantly increases the risk for diabetes, cardiovascular disease, stroke and some cancers," says Dr. Matthew During, senior author and professor in Ohio State Medical Center's department of molecular virology, immunology and medical genetics. "Our findings represent a promising new treatment for obesity that could ultimately provide a much safer and more effective approach than some conventional therapies."

Scientists have discovered that a particular gene, BDNF, can result in improved insulin sensitivity, reduced fat mass and weight loss when active in the hypothalamus. The findings are published online in the journal Nature Medicine.

According to first author Lei Cao, assistant professor in the department of molecular virology, immunology and medical genetics, the study involved injecting the BDNF gene in normal mice, diabetic mice and mice fed with a high fat diet, to determine how the gene transfer would affect their weight. "The gene was active in the overweight mice, but as they lost weight the gene expression was essentially 'dialed down,' using a novel RNA interference approach, thus stopping the weight from continuing to decrease and allowing a stable target weight to be reached,"

she says.

During indicated that with the initial results showing great promise, the next step is to obtain the necessary FDA approvals to begin studying the therapy in humans at OSU Medical Center and other centers around the country.

According to the Centers for Disease Control and Prevention, more than one-third of U.S. adults, or 72 million people, and 16 percent of U.S. children are obese. Since 1980, obesity rates for adults have doubled and rates for children have tripled.

Approximately 24 million U.S. children and adults, nearly eight percent of the population, have diabetes, according to the American Diabetes Association. An estimated 18 million people have been diagnosed with the disease, but nearly six million people are unaware that they have diabetes.

Source: Ohio State University Medical Center

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