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Glaucoma drug helps restore vision loss linked to obesity

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Working with colleagues at 38 centers nationwide, Washington University neuro-ophthalmologist Gregory P. Van Stavern, MD, has found that combining a glaucoma drug with a weight-loss program can improve vision in patients with the disorder known as idiopathic intracranial hypertension. Credit: Robert Boston

(Medical Xpress)—A new study shows that the eyesight of patients with an unusual vision disorder linked to obesity improves twice as much if they take a glaucoma drug and lose a modest amount of weight than if they only lose weight.

The condition, called idiopathic intracranial hypertension, affects an estimated 100,000 people in the United States. Most are obese women ages 20 to 50.

The researchers recently reported their results in The *Journal of the American Medical Association*.

The condition's most common symptoms are headaches and vision problems, including blind spots, poor peripheral vision, double vision and temporary episodes of blindness. Five to 10 percent of women with the disorder experience disabling vision loss. Only about 5 percent of cases involve men.

"The condition results in elevated pressure in the fluid surrounding the brain and the spinal cord," said co-author Gregory P. Van Stavern, MD, a neuro-ophthalmologist at Washington University School of Medicine and Barnes-Jewish Hospital in St. Louis. "We don't completely understand the disorder but know it affects the optic nerve because when fluid pressure is elevated, the optic nerve is swollen when we examine the eye."

Previous research has found that losing 5 to 10 percent of body weight can improve symptoms in many patients. The glaucoma drug used in the study, acetazolamide, is a diuretic given to glaucoma patients to reduce pressure in the eye. Many eye specialists also have prescribed the drug—given as a pill rather than eye drops—to reduce fluid production in and around the brain.

The disorder also is called pseudotumor cerebri because its symptoms resemble those of a brain tumor, and it is becoming more common as the obesity epidemic grows. In developing countries where obesity is uncommon, very few cases of idiopathic intracranial hypertension exist, Van Stavern said.

The study was conducted at 38 clinical sites in the United States and included 161 women and four men with the disorder and mild vision loss.

At the time subjects enrolled in the study, their average body mass index (BMI) was about 40. A BMI of 30 or greater is considered obese.

Participants were placed on an exercise plan and diet designed to lower salt intake and cut 500 to 1,000 calories each day. The goal was to get subjects to lose at least 6 percent of their body weight. In addition to dietary advice, all study subjects were provided with a weight-loss coach and low-cost exercise equipment.

About half of the participants also randomly were chosen to receive acetazolamide. When the study began, subjects received 1 gram of the drug per day. The dose then was increased by a quarter of a gram each week until study patients reached their maximum tolerated dose or were taking up to 4 grams of the drug daily. The other participants received an inactive placebo with escalating "dosages" during the study.

"Acetazolamide makes certain foods and carbonated beverages taste really bad," said Van Stavern, an associate professor of ophthalmology and visual sciences and of neurology. "Some experts thought that acetazolamide might be causing people to lose weight just because they avoided foods that didn't taste good."

But the researchers found an additional benefit in participants taking the drug. After six months, patients in both study groups had improved vision. But for those who lost weight and took the drug, eyesight improved almost twice as much as in those who lost weight but got the placebo.

At the end of the study, those who took the glaucoma drug also had less

swelling in the optic nerve than those who lost weight and received the placebo. The drug-weight loss combination also was linked to greater improvements in daily function and quality of life.

"So although both groups did well, the patients who took the drug and did the weight-loss regimen fared much, much better," Van Stavern explained. "Their vision improvement was independent of the fact that the drug makes some foods taste lousy."

Van Stavern said he expects more information will be culled from the data over the next few years. Several hormones and a number of genes have been linked to idiopathic intracranial hypertension, and those factors are being analyzed. But for now, the researchers said many patients stand to benefit.

"This study provides a much-needed evidence base for using acetazolamide as an adjunct to weight loss," said Michael Wall, MD, the national director of the study and a professor of neurology and ophthalmology at the University of Iowa in Iowa City. "This drug has been around since the 1950s, and prior studies have found varying degrees of efficacy. One strength of our study is that we slowly introduced patients to the highest tolerated dose in an attempt to maximize efficacy while limiting side effects."

More information: Wall M, et al for the NORDIC Idiopathic Intracranial Hypertension Study Group Writing Committee, "Effect of acetazolamide on visual function in patients with idiopathic intracranial hypertension and mild visual loss: the idiopathic intracranial hypertension treatment trial." The *Journal of the American Medical Association*, vol. 311 (16), pp. 1641-1651. April 23/30, 2014. DOI: 10.1001/jama.2014.3312