Growth Hormone May Reduce Liver Fat in Young Adults With NAFLD

Developing treatments for fatty liver disease has proved challenging, and there are currently no approved medications.

November 3, 2020 By Liz Highleyman

Genetically engineered human growth hormone may offer a future treatment option for people with obesity and non-alcoholic fatty liver disease (NAFLD), according to a recent report in the journal Clinical Endocrinology. This pilot study was small, however, and further research is needed.

NAFLD and its more severe form, non-alcoholic steatohepatitis (NASH), are responsible for a growing burden of advanced liver disease. Over time, the buildup of fat in the liver triggers inflammation, which can lead to fibrosis (scarring), cirrhosis and liver cancer.

Linked to obesity and diabetes, fatty liver disease is increasingly recognized as a manifestation of metabolic syndrome, characterized by abdominal obesity, high blood pressure, elevated blood sugar and abnormal cholesterol or triglyceride levels.

Developing treatments for NAFLD and NASH has proved challenging, with several once-promising drugs failing to measure up in larger studies. Some approaches aim to improve liver health by targeting metabolic abnormalities. With no approved therapies, management currently relies on lifestyle changes, such as weight loss and exercise.

Takara Stanley, MD, of Massachusetts General Hospital and Harvard Medical School in Boston, and colleagues evaluated the effects of recombinant human growth hormone (rhGH) in young adults with obesity and NAFLD.

Growth hormone, also known as somatropin, is a protein produced by the pituitary gland. The hormone binds to receptors on various types of cells and triggers the production of insulin-like growth factor 1 (IGF-1) and other chemical messengers that stimulate growth and play a role in metabolism. Obesity is associated with a relative reduction in growth hormone production, the study authors noted.

Several brands of recombinant, or synthetic, somatropin are approved for children with growth failure and adults with growth hormone deficiency. One brand, Serostim, is approved for HIV-positive people with wasting, but studies have shown it can also reduce visceral abdominal fat in

this population.

This study included 13 women and 11 men with a body mass index (BMI) of 30 or higher (indicating obesity), a hepatic fat fraction of at least 5%—but averaging about 11%—according to MRI scans and a low level of IGF-1. Fifteen were white, none were Black and about a third identified as Latino or Hispanic. They were randomly assigned to receive daily injections of rhGH (Norditropin brand) or no treatment for 24 weeks.

Hepatic fat fraction, indicating the proportion of fat in the liver, decreased by 3.0% among people treated with rhGH, compared with a 0.3% increase in the untreated group, reflecting a relative reduction of 36%. Five of the nine treated participants, but only one of the nine in the untreated group, saw their liver fat fraction fall below 5%, considered a resolution of steatosis.

Levels of the liver enzymes ALT, AST and GGT, which can signal liver inflammation and damage, decreased more in the rhGH group. BMI, total body fat, visceral fat, subcutaneous fat, lean body mass and waist circumference all declined in the rhGH group but rose in the untreated group. IGF-1 levels increased substantially in the rhGH group while remaining similar in the untreated group. There were no notable changes in blood lipid and glucose levels or C-reactive protein (an inflammation biomarker).

Treatment was generally safe and well tolerated, with no serious adverse events linked to rhGH. No one experienced substantially elevated blood glucose levels. Four people taking rhGH reported bruising at the injection site. Adverse events included headache and jaw stiffness. No one experienced swelling—a known effect of growth hormone—and no one dropped out of the study because of side effects.

Only the changes in BMI, lean body mass and IGF-1 were statistically significant, meaning the other differences could have been attributable to chance. But fact that they mostly went in a favorable direction suggests a real effect that might become more apparent in larger studies. In particular, the magnitude of the change in hepatic fat fraction “may be clinically significant and may warrant investigation in larger studies,” the authors suggested. The 36% relative reduction in this study is within the range seen with various other drugs being studied for NAFLD and NASH.

Supporting their findings, the researchers noted that prior animal studies showed a link between growth hormone levels and liver fat. What’s more, people with growth hormone deficiency due to pituitary problems have a higher prevalence of NAFLD and NASH, which improves following growth hormone replacement. Finally, Egrifta (tesamorelin), a growth hormone-releasing factor analogue that triggers the release of growth hormone, is used to reduce visceral fat in people with HIV-related lipodystrophy, and recent studies have shown that it reduces liver fat and slows fibrosis as well.

“Data from this pilot study suggest that rhGH treatment in young adults with obesity and NAFLD may have benefits to reduce liver fat content, although larger studies are needed to confirm this effect,” the authors concluded.

Click here to read the study abstract.

Click here to learn more about NAFLD and NASH.
