

## **Growth hormone reduces abdominal fat, cardiovascular risk in HIV patients on antiviral therapy**

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Low-dose growth hormone treatment reduced abdominal fat deposits and improved blood pressure and triglyceride levels in a group of patients with HIV lipodystrophy, a condition involving the redistribution of fat and other metabolic changes in patients receiving combination drug therapy for HIV infection. However, growth hormone treatment appeared to increase blood glucose levels, particularly in those already exhibiting glucose intolerance. The study from researchers at Massachusetts General Hospital (MGH) appears in the Aug. 6 *Journal of the American Medical Association*, a special issue on HIV/AIDS.

"This study tells us that a rationally dosed growth hormone regimen does a pretty good job of improving several risk factors for cardiovascular disease in patients who develop this syndrome while taking antiretroviral drugs. But growth hormone therapy may be limited by its effects on glucose levels," says Steven Grinspoon, MD, of the MGH Neuroendocrine Unit and Program in Nutritional Metabolism, the report's senior author.

A significant number of HIV-infected individuals receiving antiviral therapy develop lipodystrophy – symptoms of which include excess fat deposits in the abdomen, a loss of subcutaneous fat in the face and extremities, increases in cholesterol and other blood lipids, and insulin resistance. Previous research has shown that growth hormone secretion is reduced in substantial number of those with the syndrome. High doses

of growth hormone did reduce lipodystrophy symptoms in earlier studies, but they also had significant, negative side effects.

The current study was designed to investigate whether a low-dose strategy, designed to produce naturally occurring growth hormone levels, would be safer. It also enrolled only individuals with HIV lipodystrophy in whom relative growth hormone deficiency was documented, a specification not included in earlier studies.

Fifty-five such patients enrolled in the 18-month, double-blinded study. Participants self-administered daily injections, with about half receiving growth hormone and the rest a placebo. Growth hormone levels were monitored several times during the study by physicians not involved in evaluating the study results, and dosage levels were adjusted to bring blood levels close to normal. Parallel changes were made in both groups, so that participants did not know whether they were receiving growth hormone or a placebo.

At the end of the study period, participants receiving growth hormone had significant reductions in abdominal fat deposits and increases in lean body mass, compared with the control group. Levels of insulin-like growth factor-1, which rises in response to blood levels of growth hormone, increased in participants receiving treatment; and triglyceride levels dropped, as did diastolic blood pressure. One test of glucose levels showed significantly elevated blood sugar in participants receiving growth hormone, particularly in those who exhibited glucose intolerance at the study's outset. However, since another test that reflects long-term glucose control did not have worse results in the growth hormone group, the overall effect on blood sugar levels was unclear.

"Low-dose growth hormone may be an effective and safe treatment for those whose glucose tolerance is normal and not for individuals with impaired glucose tolerance," Grinspoon explains. "In an earlier study,

our group showed that treatment with a drug that induces the release of growth hormone significantly decreases abdominal fat without increasing glucose levels. More work needs to be done to determine which strategy is appropriate for particular patients, as well as clarifying the role of lifestyle changes and eventually identifying new antiretroviral drugs that do not cause these metabolic abnormalities."

Source: Massachusetts General Hospital

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