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NEWS

RSNA Press Release

Growth Hormone Increases Bone Formation in Obese Women

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At A Glance

- Growth hormone replacement increases bone formation and muscle mass and decreases abdominal fat in obese women.
- Increased abdominal fat is a risk factor for bone loss.
- Growth hormone also lowers cardiovascular risk markers, such as cholesterol.
- One-third of U.S. adults are obese.

CHICAGO—In a new study presented today at the annual meeting of the Radiological Society of North America (RSNA), growth hormone replacement for six months was found to increase bone formation in abdominally obese women.

"This is the first time that the effects of growth hormone on bone have been studied in obesity," said the study's lead author, Miriam A. Bredella, M.D., a radiologist at Massachusetts General Hospital and assistant professor of radiology at Harvard Medical School in Boston. "Growth hormone is extremely important for bone health, and women with increased belly fat have weaker bones and reduced growth hormone levels."

Miriam A. Bredella, M.D.

According to the Centers for Disease Control and Prevention (CDC), approximately one-third (33.8 percent) of U.S. adults are obese. The CDC defines obesity as having a body mass index (BMI) of 30 or more. Obesity is associated with many health problems, including cardiovascular and joint diseases, diabetes, high cholesterol, asthma and sleep apnea.

In a previous study, Dr. Bredella found that women with excess abdominal fat were at increased risk for bone loss. For this study, the researchers set out to determine if administration of growth hormone would increase bone formation.

Seventy-nine premenopausal, abdominally obese women with a mean age of 36 and a mean BMI of 35 participated in the six-month, randomized, placebo-controlled trial. Each woman underwent an MR spectroscopy exam to evaluate bone marrow fat. Bone mineral density (BMD) was measured using dual-energy X-ray absorptiometry (DXA). Abdominal fat and thigh muscle area were assessed with computed tomography (CT). Baseline measurements

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were compared with follow-up results at six months to determine change.

The baseline measurements showed that 32 percent of the women had osteopenia and one woman had osteoporosis. After six months, women who had received growth hormone showed increased bone formation, increased bone marrow fat and muscle mass, and higher levels of Vitamin D. They also exhibited a loss in abdominal fat compared to the placebo group. Women with the most abdominal fat loss had greater increases in bone formation.

"In addition to bone formation, our results also showed that growth hormone increases muscle mass, decreases belly fat and lowers cardiovascular risk markers, such as cholesterol and C-reactive protein," Dr. Bredella said.

According to Dr. Bredella, the risks are minimal, and this therapy could also be applied to non-obese and postmenopausal women. "As aging is associated with reduced growth hormone secretion, this could be a potential therapy for postmenopausal osteoporosis," she said.

Coauthors are Eleanor Lin, Daniel J. Brick, Anu Gerweck, Lindsey M. Harrington, Martin Torriani, M.D., Bijoy Thomas, M.D., Anne Klibanski, M.D., and Karen Miller, M.D. This research was supported by the National Institutes of Health (NIH grants R01 HL-077674 and K23 RR-23090).

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