Low Growth Hormone May Raise CVD Risk

BY JEFF EVANS

WASHINGTON — A low level of growth hormone in obese adults is independently associated with increased carotid intima media thickness, which may translate into an elevated risk of cardiovascular disease and a severe metabolic phenotype, according to the results of a prospective, observational study.

Building on evidence gathered from previous studies of growth hormone (GH) levels in obese men and women, Dr. Hideo Makimura and his colleagues in the neuroendocrine unit and program in nutritional metabolism at Massachusetts General Hospital, Boston, analyzed stimulated GH secretion levels and other cardiometabolic risk factors in 102 lean and obese individuals.

"Taken together, these data suggest [that] strategies to increase growth hormone secretion may improve cardiovascular risk in obesity," Dr. Makimura said during the presentation of his study at the annual meeting of the Endocrine Society.

Studies including frequent blood sampling of GH have shown 75% less 24-hour GH secretion in obese men, compared with age-matched lean men. Other studies have found that 64% of obese men have a peak stimulated GH level of less than 9 mcg/L in standardized GH-releasing hormone-arginine testing, whereas less than 1% of lean men have such a level. Reduced GH has been associated with an increase in carotid intima media thickness (cIMT), a measure of atherosclerosis, in overweight and obese women.

Dr. Makimura and his associates followed 33 lean individuals, 55 obese individuals who had sufficient growth hormone, and 14 obese individuals who were deficient in growth hormone (peak stimulation GH level of 4.2 mcg/L or less). The groups had mean ages in the low to mid 40s. The participants were matched for age, sex, race, tobacco use, and blood pressure. The obese groups also were matched for body mass index and visceral adiposity.

GH-deficient obese participants had a greater mean carotid intima media thickness than did lean participants, but there was no significant difference in cIMT between the obese groups.

Lean individuals had a mean BMI of 22.5 kg/m^2, whereas GH-sufficient obese participants had a mean BMI of 37.2 kg/m^2 and GH-deficient obese participants had a mean BMI of 40.7 kg/m^2.

In a univariate analysis, peak GH negatively correlated with cIMT. GH-deficient obese participants had a greater mean cIMT than did lean participants, but there was no significant difference in cIMT between the obese groups.

The researchers obtained the same results when they used more liberal cutoffs, defining GH deficiency as peak stimulated GH secretion concentrations of less than 5 mcg/L or less than 9 mcg/L.

Dr. Makimura and his associates found in univariate analyses that peak stimulated GH also was negatively correlated with the amount of visceral adipose tissue, as well as with LDL cholesterol, triglycerides, C-reactive protein, tumor necrosis factor–alpha, and measures of insulin sensitivity.

The association between peak stimulated GH and cIMT remained significant in separate multivariate regression analyses that controlled for demographic factors, traditional cardiovascular disease risk factors (tobacco use, systolic blood pressure, and levels of cholesterol and fasting blood glucose), metabolic variables (visceral adipose tissue, BMI, HDL and LDL cholesterol, triglycerides, fasting glucose, and fasting insulin), or inflammatory markers (C-reactive protein, adiponectin, and tumor necrosis factor–alpha).

Dr. Makimura concluded that these GH-related cardiometabolic risk factors may mediate the association between reduced GH secretion in obesity and increased cIMT.

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