

The GH-IGF-1 Axis in Postmenopausal Women with Abdominal Obesity

AKADEMISK AVHANDLING

som för avläggande av medicine doktorexamen vid Göteborgs Universitet kommer att offentligens försvaras i Arvids Carlssons salen, Medicinaregatan 3, fredagen den 13 april 2007 kl. 9:00

av

Celina Franco
Legitimerad läkare

Fakultetsopponent: Prof. Ken Ho, Garvan Institute of Medical Research,
University of New South Wales,
Sydney, Australia

Avhandlingen baseras på följande delarbeten:

- I.** Franco C, Brandberg J, Lönn L, Andersson B, Bengtsson B-Å, Johannsson G.
Growth Hormone treatment Reduces Abdominal Visceral Fat in Postmenopausal Women with Abdominal Obesity: a 12-month Placebo-controlled Trial
J Clin Endocrinol Metab 2005 Mar;90(3):1466-74
- II.** Franco C, Andersson B, Lönn L, Bengtsson B-Å, Svensson J and Johannsson G.
Growth Hormone Reduces Inflammation in Postmenopausal Women with Abdominal Obesity: a 12-Month Placebo Controlled Trial
Submitted to JCEM 11 January 2007
- III.** Franco C, Koranyi J, Brandberg J, Lönn L, Bengtsson B-Å, Svensson J and Johannsson G.
Gender Differences in the Response to one Year of GH Treatment in Abdominally Obese Men and Women
Manuscript in production
- IV.** Franco C, Veldhuis JD, Iranmanesh A, Brandberg J, Lönn L, Andersson B, Bengtsson B-Å, Svensson J and Johannsson G.
Increased Thigh Intermuscular Fat is Associated with Decreased Growth Hormone Secretion in Postmenopausal Women with Abdominal Obesity
European Journal of Endocrinology 2006; 155 261-268

THE GH-IGF-1 AXIS IN POSTMENOPAUSAL WOMEN WITH ABDOMINAL OBESITY

Celina Franco Ramos, Research Centre for Endocrinology and Metabolism,
Department of Internal Medicine, The Sahlgrenska Academy, S-413 45 Göteborg,
Sweden

ABSTRACT

Abdominal obesity is associated with blunted growth hormone (GH) secretion. GH treatment in abdominally obese men reduces visceral adipose tissue (VAT) and improves the metabolic profile.

The aim of this study was to investigate alterations in the GH-IGF-1 axis in postmenopausal women and to study the effects of GH treatment on abdominal obesity, insulin resistance and other metabolic alterations associated with the metabolic syndrome. Gender differences in the response to GH treatment were also investigated.

Forty abdominally obese women participated in a randomized, placebo controlled study. The 12-month GH treatment reduced VAT, increased thigh muscle area and reduced total and LDL-cholesterol as compared with placebo. Insulin sensitivity was increased at 12 months as compared with baseline values within the GH-treated group.

There was a reduction in serum CRP and IL-6 concentrations after six and 12 months in the GH-treated women as compared with placebo. The reduction in CRP and IL-6 was associated with a reduction in VAT and hepatic fat content, as well as an increase in serum IGF-1 levels. No significant effect was seen on markers of endothelial dysfunction: sE-selectin, VCAM-1, ICAM-1 or MMP-9. These findings suggest that GH exerts an attenuating effect on the state of chronic inflammation associated with the metabolic syndrome.

A comparative study of postmenopausal women and middle-age men with abdominal obesity demonstrated that GH reduced VAT and increased thigh muscle mass more markedly in men as compared with women.

In a cross-sectional study of postmenopausal abdominally obese women an independent, negative association between pulsatile GH secretion and intermuscular AT, and between basal GH secretion and VAT was shown. These findings suggest that the interactions between fat mass and the somatotrophic axis are depot-dependent.

In conclusion, these studies have shown that GH intervention improves the cardiovascular risk profile in abdominally obese postmenopausal women and that the interaction between fat mass and GH secretion seem to be depot-dependent. Men are more responsive to the lipolytic action of GH in VAT than women. Low GH secretion may have a role in the metabolic abnormalities associated with the metabolic syndrome.