

Action of ghrelin hormone increases appetite and favors accumulation of abdominal fat

May 20 2009

The ghrelin hormone not only stimulates the brain giving rise to an increase in appetite, but also favours the accumulation of lipids in visceral fatty tissue, located in the abdominal zone and considered to be the most harmful. This is the conclusion of research undertaken at Metabolic Research Laboratory of the University Hospital of Navarra, published recently in the *International Journal of Obesity*.

Ghrelin is a hormone produced in the stomach and the function of which is to tell the brain that the body has to be fed. Thus, the level of this secretion increases before eating and decreases after. It is known to be important in the development of obesity, given that, on stimulating the appetite, it favours an increase in body weight, explained Ms Amaia Rodríguez Murueta-Goyena, doctor in biology and main researcher of the study.

However, researchers at the University Hospital of Navarra have discovered that, besides stimulating the hypothalamus to generate appetite, ghrelin also acts on the tabula rasa cortex. They observed how this hormone favoured the accumulation of lipids in visceral [fatty tissue](#). In concrete, it causes the over-expression of the fatty genes that take part in the retention of lipids, explained Ms Rodríguez.

It is precisely this accumulated fat in the region of the abdomen that is deemed to be most harmful, as it is accompanied by comorbidities, visceral obesity being related to higher blood pressure or type 2 diabetes. Moreover, being located in the abdominal zone and in direct contact with

the liver, this type of fatty tissue favours the formation of liver fat and increases the risk of developing resistance to insulin. Normally, on being associated with hypertension, high levels of triglycerides, resistance to insulin and hypercholesterolemia, visceral fat favours the metabolic syndrome, the researcher pointed out.

Ghrelin can show itself in acylated or deacylated form, the difference being in the octanoic acid present in the composition of the former, according to Ms Rodriguez. Previously it was thought that only the acylated form was active in the process of weight increase, but many studies point to both hormones being biologically functional.

Future development of pharmaceutical drugs

This discovery of the twin action of ghrelin on the organism opens the door to future treatment for obesity and which, for the time being, is limited to in vitro studies in cell and animal models, the University Hospital researcher pointed out. This inclusive perspective of the functioning of a hormone is necessary in order to design effective pharmaceutical drugs. There are many hormones that intervene in the control of appetite in the hypothalamus and, at the same time, can act on other organs, such as the liver, the muscles or fat, for example. Thus, the medication developed should block the action of ghrelin both on the hypothalamus and on the accumulation of abdominal fat.

At the same time, stated Ms Rodríguez, it has to be taken into account that this hormone also acts on the liver and favours the capturing of glucose in the muscle. They observed that the concentration of acylated-form ghreline in the blood increases amongst obese persons and particularly when these, moreover, suffer from diabetes. Thus, obese persons with diabetes have greater tendency to accumulate visceral fat than normoglycemic obese persons. This is a little-studied field which has to be investigated in order to develop pharmaceutical drugs which

annul this action of ghrelin.

Blood analysis and stimulation of adipocytes

The research undertaken at the Metabolic Research Laboratory of the University Hospital of Navarra principally involved the analysis of the blood of 80 patients, both obese and thin, and in the stimulation with ghrelin of the fatty cells from surgical operations. First they analysed the ghrelin levels in the blood. Then, based on the biopsies of visceral fat obtained from 24 patients subjected to various operations, the adipocytes or fatty cells were separated and subsequently stimulated with hormone, which enabled the researchers to evaluate the changes generated in the genes that favoured the [lipid](#) accumulation in these isolated adipocytes, explained the researcher.

Source: Elhuyar Fundazioa

Citation: Action of ghrelin hormone increases appetite and favors accumulation of abdominal fat (2009, May 20) retrieved 19 April 2024 from <https://medicalxpress.com/news/2009-05-action-ghrelin-hormone-appetite-favors.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--