

# The relationship between prenatal stress and obesity is confirmed in rats

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The intrauterine environment plays an important role in the health of the offspring. Now, experts from the University of Navarra affirm that the mother's stress, due to socio-economic or psycho-social causes, is associated with the development of pathologies related with obesity.

"The growing [prevalence of obesity](#) cannot be solely attributed to genetic factors or [poor nutrition](#), but also to lifestyle and adverse environmental factors," as explained to SINC by Javier Campión, lead researcher of this new study. "The said environmental factors could have a bearing on [epigenetic mechanisms](#), which are responsible for the control of genes beyond the genetic code itself".

For the authors, the fast pace which characterizes society produces an increase in stress rates within the population, and this rise, in parallel with the rates of obesity, makes an analysis of the interaction necessary between these two factors which do not only affect adult age groups.

The objective of the work, which was published in the magazine *Stress*, was to determine the effect on [adult rats](#) of moderate [chronic stress](#) during the final week's embryonic development on the phenotypical, biochemical and hormonal changes.

To do this the researchers studied two groups of rats, with and without stress, and examined in the offspring any alterations in the expression of genes related with obesity and the metabolism of glucocorticoids in the [white adipose tissue](#).

"The general conclusion we obtained was that an adverse situation during intrauterine development could lead to animals, due to the ingestion of a hyper-calorific diet, experiencing a greater increase in body fat and biochemical, hormonal and genetic alterations," underlined Campión.

In addition the authors insisted that these changes at adult age induced by the ingestion of a diet rich in fat and sugars provoked obesity and other associated conditions, such as insulin resistance, the result of which is the development of type-2 diabetes.

## **Pregnancy in the 21st Century**

"These days many women continue with their hectic lives during pregnancy almost up to the birth, without noticing the stress they may be under," the researcher indicated.

The experts allege that stress, which during the normal life of a woman may not affect health, could be altering the development of the baby and leading to a predisposition towards the development of pathologies during adulthood, possibly due to epigenetic modification. Every year, problems relating to obesity are responsible for over 2.8 million deaths throughout the world.

"A healthy life during the pregnancy does not only consist of a good diet, with a good provision of vitamins and minerals, but also in living a quiet life, without stress," Campión concluded.

**More information:** L. Paternain, A.L. de la garza, M.A. Batlle, F.I. Milagro, J.A. Martínez & J. Campión. "Prenatal stress increases the obesogenic effects of a high-fat-sucrose diet in adult rats in a sex-specific manner". *Stress*, 16(2): 220–232, marzo de 2013.

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