Christos Tsagkaris et al., J Obes Weight Loss Ther 2018, Volume 8
DOI: 10.4172/2165-7904-C3-064

Serotonin and leptin: Hormonal processes in the brain as regulators of body weight

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In recent years, the study of pathophysiology has made great progress by investigating pleiotropic hormonal interactions and their coexistence with behavioral factors. Leptin, which is produced in adipose tissue and orchestrates a hypothalamic feedback system, has become widely known as the appetite hormone. At the same time, serotonin transferability is correlated with cholesterol levels. The purpose of this study is to investigate the contribution of the brain to weight control. We focus on leptin and serotonin. The materials and methods utilized during this study include a review of publications in a reputable electronic database (PubMed, Elsevier), using specific keywords in the search engine (microglia, obesity, POMC, brain, serotonin, cholesterol). We selected articles from reliable journals whose results were summed up and compared. The results show that in animal models with leptin receptor insufficiency in myeloid cells, hyperphagia and weight gain occur. In the hypothalamus, the number of POMC neurons and α-MSH projections from the arcuate nucleus in the sub-ventricular nucleus are reduced, in combination with the presence of significantly less microglia with phagocytic capacity. At the same time, in a sample of volunteers, cholesterol levels appeared to correlate with the expression of serotonin transporters at the gene level. Correlation is particularly strong in younger people. To conclude, hormonal processes appear to affect human psychology by exerting double biochemical and behavioral control over body weight. This interpretation makes it seemingly more difficult to understand the mechanisms of obesity. However, its individual data provides opportunities for developing new biomarkers and therapeutic approaches.

Biography

Christos Tsagkaris is an undergraduate Medical student in the University of Crete, Faculty of Medicine. He is a Fellow of the Gastrointestinal Immunology Laboratory and the Museum of Medicine of the University of Crete. Moreover he has a special interest in humanities, taking part in medical history and sociology projects.

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