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ENHANCED AND DELAYED STRESS-INDUCED BODY WEIGHT IN MICE LACKING FUNCTIONAL NATRIURETIC PEPTIDE-A RECEPTORS

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Genetic and environmental influences are both known to be causal factors in the development and maintenance of obesity. Stress related chronic stimulation of the hypothalamic-pituitary-adrenal (HPA) axis and resulting increased glucocorticoid exposure is known to be an important pathophysiological mechanism in the development of obesity. We show that the natriuretic peptide system, that mediates endocrine and behavioural responses to stress, plays a role in the control of long-term body weight in chronically ethanol drinking mice. In mice lacking functional NPR-A receptors, physical, and in particular psychological stress leads to enhanced and continuous increase in body weight in homozygote NPR-A mice. The effect of repeated stress on body weight appeared rapidly and persisted throughout life. Over a longer period of time without stress, body weights do not differ between the different genotypes. Moreover, we could demonstrate that NPR-A homozygote mice show significant higher corticosterone levels following stress. Heterozygote animals show an intermediate phenotype concerning body weights and corticosterone levels following stress. Alterations in the NPR-A receptor gene may constitute a genetic risk factor for stress-induced eating and obesity.

https://doi.org/10.1016/S0924-9338(09)71490-7 Published online by Cambridge University Press