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BDNF LEVELS IN RATS EXPOSED TO CAFETERIA DIET ASSOCIATED WITH CHRONIC STRESS

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Introduction: Chronic stress associated to hypercaloric diets and obesity has been linked different neuroendocrine and molecular changes. Brain-derived neurotrophic factor (BDNF) and its receptor, TrkB are expressed in the paraventricular nucleus on hypothalamus and many others brain regions, and display effects upon synaptic plasticity and neuroprotection. BDNF is involved in many activities modulated by the HPA axis, associated with diseases food. This study aimed to evaluate the effects cafeteria diet plus chronic restraint stress upon BDNF levels in serum and in brain structures. Results and methods: Sixty-day-old male Wistar rats were divided into 4 groups: control (C); cafeteria diet (CD); stress (S) and stress + cafeteria diet (CHD). The restraint stress was applied for 1 h per day/5 days, per 80 days. We evaluated levels of BDNF in serum, hippocampus, hypothalamus, pre frontal cortex and olfactory bulb. We evaluated also delta weight as obesity parameter. All results are expressed as mean \pm standard error of the mean (SEM), and data and interactions were evaluated by two-way ANOVA followed by Bonferroni tests. The exposure to cafeteria diet for 80 days was able to induce obesity in rats, with increased delta weight ($F(1,36)=10.564$, $P=0.03$). On the other hand, there was interaction between independent factors in BDNF olfactory bulb levels ($F(2,25) = 0.993$, $P=0.03$), but was not observed significant differences in levels of BDNF in serum, hippocampus, hypothalamus and pre frontal cortex ($P>0,05$). Conclusion: In a previous study we showed decreased serum levels of BDNF in animals fed with a cafeteria diet for 40 days (data not shown) but without stress. Thus, our findings (80 days) may suggest the great adaptability and plasticity of nerve structures in situations of obesity with and without stress. Based on previous studies we believe that a longer exposure (up to 80 days) to both factors could lead to changes in the BDNF SNC levels. Financial Support: FIFE/HCPA, PIBIC CNPq/HCPA, CNPq, CAPES.