

Poster presentation

Cellular mechanisms underlying the effects of an early experience on cognitive abilities and affective states

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Background

In the present study we investigated the effects of neonatal handling, an animal model of early experience, on spatial learning and memory, as well as on hippocampal GR, MR, 5HT1A receptors, BDNF, and circulating leptin levels, of male rats.

such as stress-induced hyperphagia, obesity and resistance to leptin.

Method

Spatial learning and memory following an acute restraint stress (30 min) were assessed in the Morris water maze. Hippocampal GR, MR and BDNF levels were determined immunocytochemically. 5HT1A receptors were quantified by in vitro binding autoradiography. Circulating leptin levels were measured by RIA. Data were statistically analyzed by ANOVA.

Results

Neonatal handling increased the ability of male rats for spatial learning and memory. It also resulted in increased GR/MR ratio, BDNF and 5HT1A receptor levels in the hippocampus. Furthermore, leptin levels, body weight and food consumption during chronic forced swimming stress were reduced as a result of handling.

Discussion

Neonatal handling is shown to have a beneficial effect in the males, improving their cognitive abilities. This effect on behavior could be mediated by the handling induced increase in hippocampal GR/MR ratio and BDNF levels. The handling induced changes in BDNF and 5HT1A receptors could underlie the previously documented effect of handling in preventing "depression". Furthermore, handling is shown to prevent other maladaptive states