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Poster board B8 - Mon 14/07/2008, 16:00 - Hall 1

Session 114 - Neurotransmitters 2

Abstract n° 114.8

Publication ref.: *FENS Abstr.*, vol.4, 114.8, 2008

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Title Environmental enrichment supresses dopamine and coricosterone increases produced by acute stress in the prefrontal cortex of the rat.

Text The aim of the present study was to investigate whether environmental enrichment (EE) modifies the effects of an acute stress on the extracellular concentration of dopamine and corticosterone in the prefrontal cortex (PFC) of the awake rat. Animals used were male Wistar rats (3 months of age) housed in control (one animal per cage) or in EE conditions (10-12 animals in cages of 120x100x60cm, containing a set of tunnels and several kinds of objects rearranged every 3 days, and two running wheels) until they reached 6 months of age. Rats were then implanted with a bilateral system of guide cannulae to perform microdialysis experiments in the PFC. Six-seven days after surgery, microdialysis experiments were performed. Acute stress consisted of a period of 20 min restrain produced by wrapping tightly the animal using a cloth tied with velcro. Concentrations of dopamine and its metabolites (HVA and DOPAC) were measured by HPLC coupled to electrochemical detection. Corticosterone in the dialysates was measured by radioimmunoassay. In control group, stress increased the extracellular concentration of dopamine ($p=0.0087$), HVA ($p=0.004$), DOPAC ($p=0.007$) and corticosterone ($p=0.011$). In EE group, stress did not modify these parameters. The concentration of dopamine and corticosterone in the PFC of EE rats in response to stress was significantly different (dopamine: $p=0.01$; corticosterone: $p=0.045$). Also the effects of D1 dopamine receptors stimulation in the PFC on local extracellular concentration of corticosterone were investigated. Stimulation of D1 receptors in the PFC (SKF38393, 40 min, 50 micromolar) did not modify the extracellular concentration of corticosterone in control or EE group. These results suggest that environmental enrichment supresses the response to stress of the dopaminergic system in the prefrontal cortex and hypothalamus-pituitary-adrenal axis. This study has been supported by SAF2006-01564 and PR34/07/1874.

Theme B - Neural excitability, synapses and glia: cellular mechanisms
Neurotransmitters and signaling molecules - Monoamines