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ELEVATED PLUS MAZE TEST/ OPEN FIELD BEHAVIOUR

HARUTHAI THAIDEE : ENVIRONMENTAL INFLUENCES DURING DEVELOPMENT ON THE RESPONSIVENESS TO ADDICTIVE AGENTS IN THE MATURE RATS. THESIS ADVISORS: NOPPAMARS WONGWITDECHA, Ph.D., BASIL ARTHUR BALDWIN, Ph.D. 124 p. ISBN 974-665-209-5

The objective of this thesis was to investigate the effects of two addictive agents: caffeine and ethanol on the elevated plus maze and the open field behaviours of rats reared under different conditions: social and isolation rearing. Male Wistar rats were reared from weaning either in isolation or in social group for 5 weeks. Each rat was tested for 5 min. either on the elevated plus maze or in a circular open field arena.

The results demonstrated that the saline-treated isolation reared rats showed the anxiogenic profile on the elevated plus maze, exhibited locomotor hyperactivity (higher total zone transitions), had a larger number of rears, a larger number of entries and spent a longer time in the inner zone of a circular open field arena than the socially reared rats.

Acute treatment with caffeine (10, 20 and 50 mg/kg i.p.) produced biphasic effects on the elevated plus maze behaviours in socially reared rats. A Low dose of caffeine (10 mg/kg i.p.) induced an anxiolytic-like effect, whereas higher doses (20 and 50 mg/kg i.p.) produced the anxiogenic-like effect. The biphasic effects of caffeine were not seen in isolation reared rats.

For the open field test, acute administration with low doses of caffeine (10 and 20 mg/kg i.p.) significantly increased the total zone transitions and the number of rears only in socially reared rats. However, the highest dose of caffeine (50 mg/kg i.p.) significantly decreased the total zone transitions and number of rears in both isolation and socially reared rats. All three doses of caffeine (10, 20 and 50 mg/kg i.p.) significantly enhanced the number of entries and time spent in the inner zone of socially reared rats, but had no marked effect on isolation reared rats. Chronic treatment of caffeine (10 mg/kg i.p.) once daily for 21 days significantly caused hyperlocomotion, and increased the number of entries and time spent in the inner zone of both isolation and socially reared rats. However, these effects were more pronounced in socially reared rats.

In the socially reared rats, all three doses of ethanol (300, 600 and 1200 mg/kg i.p.) significantly produced the anxiolytic-like effect. However, only the highest dose of ethanol (1200 mg/kg i.p.) significantly induced the anxiolytic-like effect in the isolation reared rats. This effect of ethanol was more pronounced in socially reared rats.

For the open field test, acute treatment with ethanol (300, 600 and 1200 mg/kg i.p.) did not significantly alter the total zone transitions and number of rears in both socially and isolation reared rats. High doses of ethanol (600 and 1200 mg/kg i.p.) decreased the number of entries and time spent in the inner zone only in isolation reared rats. Chronic treatment with ethanol (600 mg/kg i.p.) once daily for 21 days significantly decreased the total zone transitions and number of rears only in socially reared rats, but this agent significantly reduced the number of entries and time spent in the inner zone only in isolation reared rats.

These results demonstrate that the environment during development can alter the behaviours of mature rats. It also modifies the sensitivity to the addictive agents: the CNS stimulant- caffeine, and the CNS depressant- ethanol.