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Differential Monoaminergic System Response After a Combination of Stress Procedures on Female Rats

C. Dalla, K. Antoniou, S. Daskas, A. Dellia-Sfikaki and Z. Papadopoulou-Daifoti

Department of Experimental Pharmacology, University of Athens Medical School, Goudi, 11527 Athens, Greece

INTRODUCTION-AIM

It is generally believed, that a critical point for the development of the pathophysiology of phsychiatric disorders, such as depression, is related to the occurrence of certain stress conditions. Therefore, the research interest of many investigators focuses on the development of animal models of anxiety and depression. It is important to mention, that the majority of animal models of depression depend on animal responses to stressors that have a short or long term duration.

The aim of the present study is the investigation of monoaminergic system function in different brain regions of female rats, after the application of the following stressful conditions: a) forced swim test and b) chronic mild stress and forced swim test.

METHODS

Female Wistar rats were used throughout the experimental procedures. In the first experiment, the rats were subjected to two swim tests, at 24^{0}C, with an interval of 24 hours between the two tests. In the second experiment, after the chronic mild stress procedure, which consists of various unpredictable stressors alternating for a period of 9 weeks, the rats were subjected to the forced swim stress procedure. At the end of each experimental procedure, the animals were decapitated and the monoaminergic function was estimated by HPLC-ED.

RESULTS-CONCLUSIONS

Our data showed that there is a decrease of serotonergic function in the hypothalamus and prefrontal cortex after the forced swim test. When chronic mild stress was followed by the forced swim stress procedure, noradrenergic function in the hippocampus, hypothalamus and striatum was affected, and serotonergic function in the hypothalamus and hippocampus was decreased. The above results, show that when a short-term stressor follows a chronic stress procedure, it induces a different neurochemical background. These findings suggest that the occurrence of a novel short-term stressful condition in an already disturbed background plays an important role on the presentation and course of a certain disorder such as depression.