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EFFECT OF A COMBINATION OF A DRY EXTRACT OF MOTHERWORT AND GAMMA-AMINOBUTYRIC ACID ON THE COGNITIVE FUNCTION OF RATS

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In modern conditions, during the rapid development of information technologies, against the background of environmental, social and other cataclysms in Ukraine, as well as around the world, there is a further increase in the number of anxiety conditions that accompany clinical symptoms in patients with neuropsychiatric and psychosomatic disorders.

The use of drugs such as anxiolytics, antidepressants, sedatives, etc., due to the possible development of a number of adverse reactions (addiction, drug dependence, "withdrawal" syndrome) is often difficult in this category of patients and can have a significant effect on compliance.

Symptomatic treatment of increased anxiety with "alternative therapy" namely, with preparations of plant origin, is quite justified in case of unrepresentative symptoms of the disease. In this case, their advantages over synthetic drugs should be taken into account a wide range of pharmacological activity, sufficient therapeutic effectiveness, a lower risk of adverse reactions.

Purpose study the effect of a combination of a dry extract of Motherwort and gamma-aminobutyric acid on the cognitive function of rats under acute stress reaction conditions.

Materials and methods. The combination of dry extract of motherwort and gamma-aminobutyric acid (DEM + GAA) on a pharmacologically inert carrier (sucrose) was obtained and standardized at the department of pharmacognosy of National University of Pharmacy. The psychotropic properties of the combination (DEM + GAA) were studied on 36 white nonlinear male rats weighing 220-250 g. Experimental animals were kept in standard cells, on a standard dietary diet with free access to water and food. The combination of DEM + GAA was administered to rats intragastrically at doses of 2 mg/kg, 4 mg/kg, 8 mg/kg (calculated as GAA) in the form of an aqueous solution of 1.0 mL per 100 g of animal weight.

As comparison preparations, an official tincture of motherwort (pharmaceutical factory "Viola," Ukraine) and GAA substance were used.

The study of the effect of the combination of DEM + GAA and comparators on the cognitive functions of rats under stress conditions was evaluated using the extrapolation deliverance test. The behavior of each rat was monitored for 3 minutes, and the test results were evaluated for the following parameters: the latent diving period of the animals under the lower edge of the inner cylinder (task time) and the total number of rats that solved the task of getting rid. If the animal did not dive under the edge of the cylinder during the observation period, the latent period was counted as 180 seconds. The experiment involved 6 groups of animals: intact control; animals

treated with DEM + GAA at doses of 2 mg/kg, 4 mg/kg, 8 mg/kg; rats treated with a motherwort tincture and gamma-aminobutyric acid.

The extrapolation deliverance test has a high aversive potential and is accompanied by the triggering of an acute stress response in laboratory animals. Statistical processing of the study results was performed using the Statistica 8.0 program.

Results and discussion. The results of this test reflect 2 main blocks of behavioral reactions of experimental animals: aversive reactions associated with the motivation of fear and the desire to avoid a stressful situation (latent period of implementation and the number of aversive movements) and the manifestation of a search strategy for solving a heuristic problem (targeted diving under the edge of the installation cylinder).

The latent period for performing aversive movements in animals of the intact control group was 4.33 s, and the average number of jumps inside the cylinder and diving attempts was 22.66. At the same time, the latent time of the task was 77.5 s. 33.33% of rats of this group reached the recovery criteria.

The combination of DEM + GAA at 2 mg/kg resulted in the most pronounced reduction in latent rat diving period by 33.6% ($p < 0.05$) relative to intact control. The number of animals in the group that reached the deliverance criterion increased to 50%. At a dose of 4 mg/kg, the combination of DEM + GAA significantly increases the latent period of the appearance of aversive movements by 3.23 times and reduces their average number by 2.96 times compared to intact control. The latter value is 2.5 times lower than in animals treated with DEM + GAA 2 mg/kg and 1.84, 1.76 and 1.60 times lower than in rats treated with DEM + GAA 8 mg/kg, motherwort tincture and gamma-aminobutyric acid, respectively. This indicates that in animals of this group, the manifestations of motor activity caused by fear are reduced. The release criteria were achieved in 66.67% of rats treated with DEM + GAA at a dose of 4 mg/kg, which is significantly higher than in the intact control group. The latent diving time under the cylinder edge was also reduced by 26.5% ($p > 0.05$) compared to the control group.

The obtained results showed that the course administration of the combination of DEM + GAA in rats at a dose of 4 mg/kg improves their cognitive functions and attenuates the manifestations of the motor component of emotional responses to an acute stress situation.

At a dose of 8 mg/kg, the combination of DEM + GAA, like the motherwort tincture, did not show a statistically significant effect on the main indicator of cognitive functions - latent diving time under the edge of the cylinder. Positive changes in the manifestations of aversive reactions were established: an increase in the latency period by 2.11 times ($p < 0.05$) and a decrease in their average number by 1.6 times ($p < 0.05$) compared to intact control.

It can be assumed that the DEM + GAA complex is to a certain extent characterized by a sedation effect, which is demonstrated by drugs based on motherwort per se.

Conclusions. In the acute stress response modeled by the extrapolation deliverance test, it was found that the combination of DEM + GAA at a dose of 2 mg/kg

improves the cognitive functions of animals, and with an increase in the dose to 8 mg/kg shows only sedation elements.

Key words: dry motherwort extract, gamma-aminobutyric acid, psychotropic properties, "extrapolation deliverance" test, male white rats.