

# INFLUENCE ULTRA-LOW DOSES OF ZINC ACETYLSALICYLATE ON THE BEHAVIOR OF RATS IN THE TEST OF PORSOLT IN NORM AND AT ACTIVATION DOPAMINERGIC SYSTEM BY UMEX

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In modern society, depressive disorders has so widespread that a global problem of all mankind. The number of persons with psychotic depression only in the countries of the European Union exceeds 20 million inhabitants, and in the Russian Federation according to the statistics of the program "COMPASS", the frequency of depressive disorders in General practice ranges from 24 to 64 % of the total number of diseases. By 2020 according to forecasts of the world health organization depressive disorders will rank second in the world on the prevalence in the structure of all diseases, according to 2012 data, approximately 350 million people worldwide suffered from depression.

According to several studies, derivatives of acetylsalicylic acid are promising chemicals that have unique effects on the nervous system in varying doses. It is known that the mechanism of action of many antidepressant means based on the ability to change functional activity of the dopaminergic neurotransmitter system. It should be noted that the study of the physiological effects and mechanisms of influence of ultra-low doses of acetylsalicylate of zinc on depressive behavior of animals is especially important, since studies of regularities of influence of various chemical factors in ultralow doses recently focused the attention of Biomedicine, physiology and related Sciences.

The aim of this work was to study the effect of ultra-low doses of acetylsalicylate of zinc on the behavior of rats in the test of Porsolt normal and at activation dopaminergic system by umex.

The research was carried out on 80 white mongrel male rats weighing 230-250 g (8 groups of 10 animals each) with average motor activity and low emotionality in open field test (setup for rats NPK "Open science", Russia). The control group animals during 14 days were injected intraperitoneally with physiological solution with a volume of 0.2 ml. Animals of the three experimental groups for 14 days daily was administered intraperitoneally with physiological solution (the functioning of the dopaminergic system in normal) and on the 14th day was carried out by single intraperitoneal injection of

acetylsalicylate zinc (synthesized at the Department of General and inorganic chemistry of the Taurida Academy Crimean Federal V. I. Vernadsky University., chemical purity was at least 95 %) in one of the ultra-low doses ( $4 \cdot 10^{-12}$ ,  $4 \cdot 10^{-9}$  and  $4 \cdot 10^{-7}$  mg/kg). The other three groups of experimental animals to increase the activity of the dopaminergic system previously for 14 days was administered intraperitoneally umex ("Chinoïn", Hungary) at a dose of 3 mg/kg on 14th day were also carried out intraperitoneal injection of acetylsalicylate of cobalt in doses of  $4 \cdot 10^{-12}$ ,  $4 \cdot 10^{-9}$  and  $4 \cdot 10^{-7}$  mg/kg, respectively. The current component umex selegiline specifically inhibits monoamine oxidase B, deplete dopamine. The eighth group of rats for 14 days daily was administered intraperitoneally, only umex (3 mg/kg). Injections diluted according to the method of Hahnemann acetylsalicylate of zinc was carried out for 30 min before the start of the experiment.

The behavior of animals under the influence of the test substances investigated for 3 min in the test of Porsolt (installation test rats for the research and production company "Open science", Moscow, Russia), which is used to detect antidepressant activity of the substances. In addition to the basic performance test (the latent period of the first unresponsiveness of animals in the water, active and passive swimming, the number jumps out) was calculated index of depression (the ratio of the total time passive swimming animals to the total time of active swimming). While testing the installation test Porsolt was isolated from external influences small experimental complex (NPK "Open science", Russia). Statistical comparison of the results was performed using the nonparametric U-Mann-Whitney test.

When performing experiments comply with ethical norms and the principles of the Helsinki Declaration of 1975, as revised and supplemented in 2000.

In the functioning of dopaminergic systems in the green, acetylsalicylate zinc showed antidepressant properties in doses of  $4 \cdot 10^{-12}$  and  $4 \cdot 10^{-9}$  mg/kg and preduprezdenie – dose of  $4 \cdot 10^{-7}$  mg/kg.

When you activate the dopaminergic system omexom (3 mg/kg) antidepressant effect of acetylsalicylate of zinc in doses of  $4 \cdot 10^{-12}$  and  $4 \cdot 10^{-9}$  mg/kg increased and protepistatis at a dose of  $4 \cdot 10^{-7}$  mg/kg – changed to antidepressant. These results confirmed the hypothesis that the dopaminergic neurotransmitter system participates in the mechanism of action of acetylsalicylate of zinc on depressive behavior of animals in midget doses.

**Keywords:** acetylsalicylic zinc, ultra-low dose, test Porsolt, dopaminergic system, umex.

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