INFLUENCE OF MODERATE ELECTROMAGNETIC SHIELDING ON EXPLORATORY BEHAVIOR AND INTERSPECIFIC AGGRESSION IN RATS

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Aggression is an evolutionarily ancient behavior, which is an indispensable tool for survival, both for a particular individual and for the species as a whole. However, this is also one of the serious health problems, because aggression is a symptom of various neurological and psychiatric disorders in children and adults, including Alzheimer's and other forms of dementia, schizophrenia and craniocerebral trauma. In addition, the problem of aggression is also relevant in the social context – it has become one of the main ways of expressing contradictions that arise both between people, groups of people, and directly in the society itself. Still no generation of people has not managed without wars, massacres, violence, robbery, destruction of material and spiritual values. That is why it is important to study the problem of aggression, namely, how to prevent the development of pathological aggressiveness or correct it.

Medico-biological studies have shown that living organisms cannot function normally without natural electromagnetic fields (EMF). At the same time, the natural geomagnetic field (GMF) in modern cities undergoes considerable distortion under the influence of numerous ferro-concrete structures and technogenic EMFs: local hyper- and hypomagnetic fields appear that have a negative impact on the functioning of living organisms. Nowadays, the increased interest in the effect of weakened GMF on the human and animal organism is also dictated by the rapid development of the aerospace area and the real prospect of regular space flights.

Previous studies of our laboratory showed an increase in both intraspecific and interspecific aggression under the effect of a 10-day moderate electromagnetic shielding (EMS), which is characterized by a particular rhythmic variability. At the same time, a number

of authors point out the advisability of conducting longer studies using a hypomagnetic surroundings to better understand how EMS affects people exposed to chronic exposure of this factor, for example, during space flights, being in shielding conditions – the subway, the cabin of sea vessels, military equipment. Therefore, the purpose of our study is to determine the effect of 21-day EMS on interspecific aggression in rats.

The studies were carried out on 16 white outbred male rats weighing 220–250 g. After we were recorded a background level of interspecies aggressions and exploratory behavior, rats were divided into two groups: "control" and "EMS" (n = 8 in each). Then, the EMS group underwent a 21-day moderate shielding, every day for 24 hours, except when the cages were cleaned (once a week to avoid additional stress) within 30 minutes outside the hypomagnetic environment. The control group was kept in standard vivarium conditions. On the 21st day, the behavior of the animals was re-registered.

The behavior of the rats was evaluated in the "reaction on mouse" test: the animals were placed at opposite ends of the round "Open Field" (97x42 cm, "Open Science") for 5 min, during which the video was monitored for the contact of the experimental rat with the mouse. The number of murders and other manifestations of aggressive behavior, such as bites and the wearing of the mouse in the teeth, were recorded [11, 15]. In addition, the social interaction of the rat with the mouse was recorded: latent period of the first sniffing reaction, total numbers of sniffing, total time spent in sniffing, number of acts of persecution and their total duration. Also determined the exploratory behavior of rats: the total number of rearings and peeking in the minks.

The chronic effect of moderate EMS leads to a decrease research behavior in male rats, which manifests itself in a decrease in the number of mink peeking by 43 % ($p<0.05$) with respect to control, and 53 % ($p<0.05$) compared with background level of this indicator. Aggressive behavior was not founded, and the parameters of social interaction of the rat with the mouse did not change significantly.

***Keywords*:** interspecific aggression, muricide, electromagnetic shielding, exploratory behavior, rats.

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