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Changes in Psychoemotional Status in Conditions of Suppressed Immunogenesis in Mice and Rats. Correction of Impairments with GABA-Positive Agents

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Behavioral and immune reactions were studied in rats and mice with cyclophosphamide immunosuppression. GABAergic agents were found to have psychoimmunostimulating effects. Indexes of delayed-type hypersensitivity and passive hemagglutination antibody titers were measured. The psychophysiological state of the animals was studied using a new model – the Suok test. Administration of phenibut (25 mg/kg) and baclofen (10 mg/kg) restored immune system activity and normalized behavioral reactions, i.e., horizontal and purposive investigative activity, decreased grooming and the duration of freezing, and increased the number of transfers through the central zone and other measures.

KEY WORDS: behavioral reactions, phenibut, baclofen, Suok test, gamma-aminobutyric acid (GABA), psychoimmunomodulation.

Recent decades have seen rapid developments in neuroimmunophysiology and neuroimmunopharmacology – among the youngest of the biomedical sciences [6, 7]. The nervous and immune systems interact closely on the mutual regulation principle [8, 9]. Impairments to any of the major components of the neuroimmune systems inevitably affect the whole complex of mechanisms controlling homeostasis, inducing compensatory or pathological changes in both the activity of CNS cells and the activity of immunocompetent cells [8]. The question of whether impairments to immunoreactivity (immunodeficiency, immune stress, etc.) in neuromental disorders are of real pathogenetic value or whether they are no more than secondary signs of the process has often been raised in the literature [9, 14, 15]. This question remains unresolved, though a number of experimental and clinical studies have noted a marked connection between the development of immune and psychoneurological disorders [2, 8, 9].

The existence of tight integrative neuroimmune interactions is supported by evidence obtained in recent years on the roles of the central neurotransmitter systems (GABAergic, serotoninergic, dopaminergic, etc.) in regulating the functioning of the immune system. The membranes of immunocompetent cells have been shown to bear specific receptors for neurotransmitters, including GABA, dopamine, serotonin, glutamine, etc. [7, 8]. The neurotransmitter balance alters the metabolic and functional activity of lymphoid cells. It has also been demonstrated that activation of the GABAergic and dopaminergic systems promotes increases in the activity of the immune system, while stimulation of the serotoninergic system produces the opposite effects [6, 7].

Given these points, there is value in studying the possible cause-effect relationships between the formation of immune system dysfunctions and behavioral reactions, as

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