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Expression of lymphocyte activation markers in long-term neuromuscular stimulation by WBV

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Since the characters of the immune response are interrelated with the activity of immunocompetent cells, the analysis of the activation profile of lymphocytes is the promising direction of immunological studies. Increase in the expression of activation antigens may coincide with an exacerbation of the pathological process, correlate with immune activity or express its ability and "willingness" to respond to environmental factors, including various pathogens and stressors. The neuromuscular stimulation by whole body vibration (WBV) has found an increasing application in in the fields of professional sports and rehabilitation medicine, but the effect of such influence on the immune system remains poorly understood. The number of cells expressing CD25+ and HLA-DR+ was studied by flow cytometry in 39 women (WBV & control groups, 67±4 yrs.). Neuromuscular stimulation used the Power Plate. Rehabilitation mode: load on the principle of progression 3 times/week for 30 min, frequency 30-40 Hz and amplitude is low, duration 24 weeks. The level of CD25+ expression (as the marker of the early stage of activation) remained practically unchanged throughout the study program in both groups. Nevertheless, in WBV-group the absolute number of CD25+ cells decreased slightly by the 24th week of program. The absolute number of T-lymphocytes expressing the late activation marker (HLA-DR+) in WBV-group was the lowest in 12 weeks of the study (40% decrease, $p<0.05$). In the control group there was a gradual decrease in the absolute also. It was concluded that the exacerbation of diseases, in particular atopic, is associated with intensive activation processes in the immune system, which is accompanied by a marked increase in the expression of early activation antigens, while the enhanced expression of late markers correlates with the severity of the disease. In our study, it was shown that long-term neuromuscular stimulation by WBV is therefore an objectively safe type of sports and medical rehabilitation.

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