

Abstract

Physiotherapy has the potential to interfere with the neuroendocrine-immune system through natural stimuli, and thus regulate complex neuroimmune processes in the central nervous system. The ability to target the immune and endocrine systems through physical activity and physiotherapy could slow disease progression, streamline tertiary prevention of the development of clinical manifestations of the disease, disability, loss of self-sufficiency, and improve patients' quality of life.

So far, only a few pilot projects have been implemented. One of them was our previous study, which allows modulating the immune and endocrine system using the methods Motor programme activating therapy - physiotherapeutic methods using neurophysiological knowledge (belongs to the category of neuroproprioceptive facilitation and inhibition). In this study, we increased the number of participants and included another physiotherapeutic method from the same category, Vojta's reflex locomotion.

44 patients with multiple sclerosis were randomly divided into two groups. Each underwent a different type of two-month outpatient neuroproprioceptive „facilitation and inhibition“ physiotherapy (Motor programs activating therapy and Vojta's reflex locomotion). Over the next two months, participants continued autotherapy. We primarily monitored the effect on the level of neuroactive steroids (cortisol, cortisone, 7α -OH-DHEA, 7β -OH-DHEA, 7-oxo-DHEA, dehydroepiandrosterone in serum), secondarily the effect on clinical manifestations (balance - Berg Balance Scale and cognitive function - Paced Auditory Serial Addition Test) and subjective perception of the impact of the disease (Multiple Sclerosis Impact Scale). Primary and secondary endpoints were evaluated three times (before therapy, after therapy and two months after therapy).

Both physiotherapy programs led to an immediate decrease in 7-oxo-DHEA (trend) and a persistent decrease in 7β -OH-DHEA. In terms of clinical outcomes, both groups had an immediate improvement in cognitive function as assessed by the Paced Auditory Serial Addition Test ($p = 0.010$) and subjective perception of disease impact as assessed by the Multiple Sclerosis Impact Scale ($p = 0.044$).

The groups did not differ in effect on clinical function, but the effect on neuroactive steroids is more visible in the group that underwent Vojta's reflex locomotion [cortisone ($p = 0.0223$), 7β -OH-DHEA ($p = 0.0232$), 7-oxo-DHEA ($p = 0.0053$)].

Physiotherapeutic methods of neuroproprioceptive „facilitation and inhibition“ (Motor programs activating therapy and Vojta's reflex locomotion) have a significant effect on cognitive functions and perception of the impact of the disease. Clinical changes were accompanied by changes in neuroactive steroid levels. However, the interpretation of changes is difficult and for targeted use in clinical practice, further research is needed to clarify which afferent stimuli used in physiotherapy affect the endocrine system (how and what parameters). Both methods have proven to be a suitable tool for tertiary prevention.