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## THE ROLE OF TRANSCRANIAL MAGNETIC STIMULATION IN THE TREATMENT OF MOTOR SYMPTOMS OF PARKINSON'S DISEASE

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**Introduction:** Parkinson's disease (PD) is a neurodegenerative disease that is clinically manifested by a combination of motor and non-motor symptoms, which are caused by complex neurotransmitter dysfunction. Nowadays, the method of rhythmic transcranial magnetic stimulation (rTMS) in the treatment of PD is actively used in clinical practice. The method has a great therapeutic potential because of its effectiveness in improving motor activity, reducing cognitive deficits and symptoms of depression, with fewer number of side effects compared to pharmacotherapy [Chou Y., 2019, Yang C., 2018, Machado S., 2016]

**Methods:** analysis of electronic databases about results of the study therapeutic effects of rTMS in PD treatment.

**Results:** rTMS can induce neuronal plasticity by modulating neural connections in the human brain. The effectiveness of rTMS was proved in a double-blind placebo-controlled study, which showed a significant improvement in motor symptoms in patients with PD compared with the placebo group [Zanjani A., 2015]. According to a meta-analysis of 23 studies with a total of 646 patients with PD, there was shown the presence of significant short- and long-term effects of rTMS on the improvement of motor manifestations of PD [Yang C et al., 2018]. It was found that stimulating the primary motor cortex (M1), with the high-frequency rTMS protocol shows positive effects which are significantly more pronounced than at low-frequency rTMS. At the same time, according to Matsumoto H., (2017), the most effective modality for improving motor symptoms is the stimulation of the primary motor cortex with a frequency of 5 Hz (low-frequency rTMS), which increases the excitability of the zone. The objectification of treatment results by diagnostic neurophysiological methods is promising. Kolmancic K. (2019) confirms the change in excitability and plasticity of the sensorimotor cortex in the early stages of PD: depending on the patient's sex, interhemispheric imbalance and asymmetry are detected. It is noteworthy that recent studies have shown a correlation of neurophysiological disorders in the primary motor cortex with the severity of bradykinesia in patients with PD, namely a decrease in the amplitude and latency of intracortical inhibition. In turn, dopaminergic therapy has been shown to improve motor activity to the same extent as neurophysiological parameters. [Kojovic M., 2015, Bologna M., 2018].

**Conclusions:** The results of the literature data are promising but contradictory. Therefore, it is important to further study the effectiveness of TMS not only on motor symptoms, but also on non-motor manifestations of PD, as well as the study of the dynamics of neurophysiological parameters in correlation with the clinical manifestations of the disease.

**Keywords:** Parkinson's Disease, Transcranial Magnetic Stimulation, Neurophysiological Study

