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ANALYSIS OF THE EFFICACY OF TMS IN RESPECT OF NON-MOTOR DISORDERS IN PARKINSON'S DISEASE

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Abstract:

Relevance of the topic Parkinson's disease is one of the important problems of clinical neurology throughout the world and is a chronically developing neurodegenerative pathology of the brain. One of the most observed symptoms of Parkinson's disease is pain, which significantly reduces the quality of life of patients. Various pain sensations often cause stress in patients, adversely affect adaptation processes and cause depressive changes. On average, 40-80% of patients complain of pain of various nature, duration and localization.

Keywords: Parkinson's disease, pain syndrome, transcranial magnetic stimulation

"Materials and methods for assessing clinical variants of pain syndrome in Parkinson's disease" presents a methodological approach and methods for solving the problem. 136 participants (78 men and 58 women, mean age 64.2±5.2 years) were selected to participate in the study. The diagnosis of the disease was based on the clinical diagnostic criteria of the British Board of Parkinsonism (Gibb W.R.G., Lees AJ., 1994). The main group consisted of 107 patients with scores of 2.6 ± 1.1 on the Hoehn-Yar scale, duration of the disease 4.1 ± 1.9 years, UPDRS score (Uniform rating scale for assessing Parkinson's disease) 46.7 ± 1.6 points with Parkinson's disease. The control group consisted of 29 practically healthy people.

We divided all patients with identified PD in the main group (MG) into 2 subgroups. Subgroup I consisted of 64 PD patients with BS (pain syndrome), and subgroup II consisted of 43 PD patients without BS. Subgroup I participants consisted of 38 men and 26 women. In subgroup II there were 29 men and 14 women. The control group consisted of 11 healthy men and 18 women. The age of AH patients included in the study was divided into groups from 45 to 59 years and from 60 to 74 years, the mean age was 64.2 ± 5.2 years, the mean UPDRS score was 47.2 ± 13.6 points.

The severity of the disease was assessed using the Hoehn-Yar scale; the study included patients with the first to third stages of the disease. According to the Hoehn-Yar scale, the average severity level in patients of the main group was 2.5±0.6 points. The distribution of patients in the main group by age, sex and stage of the disease is presented in the table. All clinical trials were conducted with the consent of the patients themselves.Analysis of the effectiveness of TMS in relation to non-motor disorders in Parkinson's disease. Patients who received complex treatment were prescribed a session of TMS procedures (Transcranial Magnetic Stimulation), which were performed every week for five consecutive days with a break of 2 days for three weeks. Each session lasted 15-30 minutes.

Pregabalin was used at 75 mg divided into 2 doses. Given the effect of psychostimulation, the daily dose of the drug is recommended to be taken at 16:00. The duration of treatment was 3 weeks.

All patients were provided with detailed information about the mechanisms of action, drug interactions and side effects of the proposed treatment.

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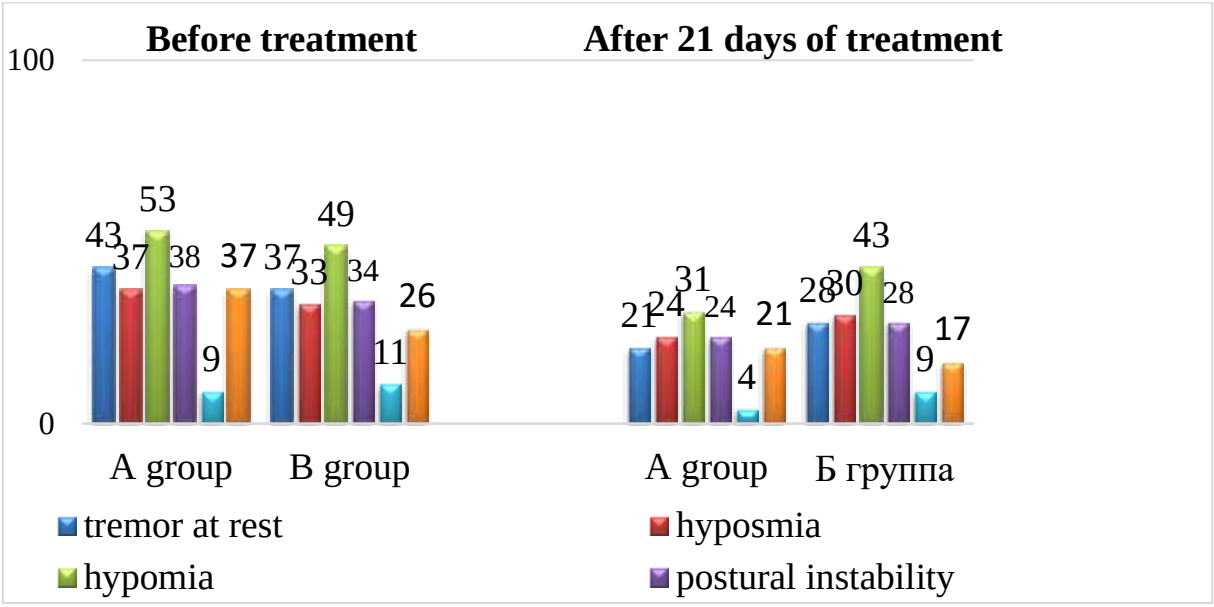
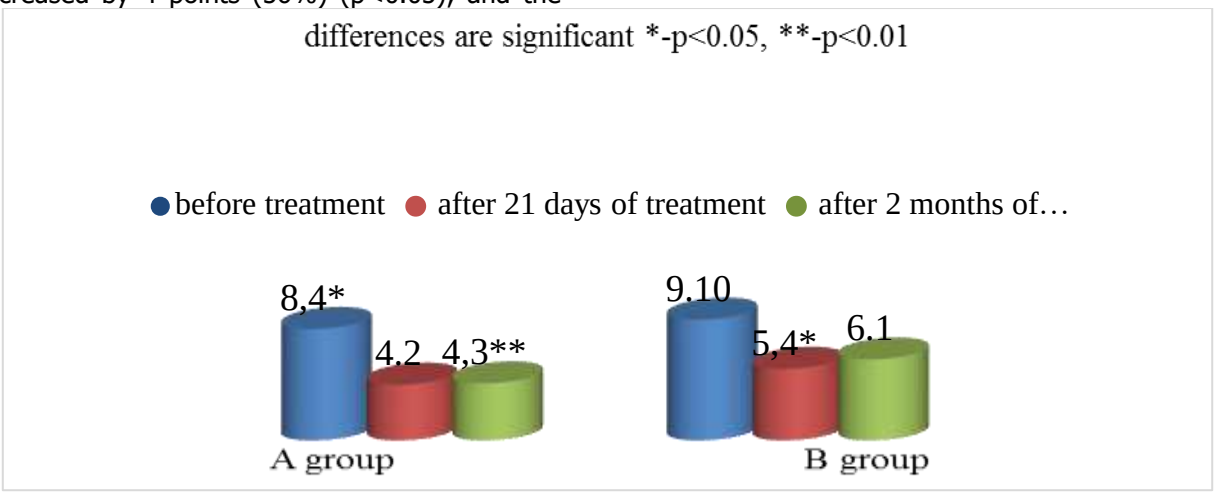


Rice. 5. Results of the neurological examination

Before treatment, patients with neurological symptoms had high rates of hypomimia, tremor, and hyposmia. After treatment, its dynamic decrease is observed. (Fig. 5)

Based on the analysis of recent treatment results, VAS decreased by 4 points (56%) ($p<0.05$), and the severity of depression on the Beck scale decreased by 8 points (45%) ($p<0.05$). Motor activity UPDRS increased by 32 points (28%) ($p<0.05$), and daily activity increased by 24% ($p<0.05$).



Rice. 6. The results of patients in groups according to the VAS scale before and after treatment.

To assess the effectiveness of treatment in both groups, a comparative analysis of the results of pain syndrome assessment using the VAS questionnaire was performed 21 days after treatment and 2 months after treatment (Fig. 6).

As can be seen from the data, the results obtained after treatment in the participants of group A were 2 times more positive than in the participants of group B ($p<0.05$).

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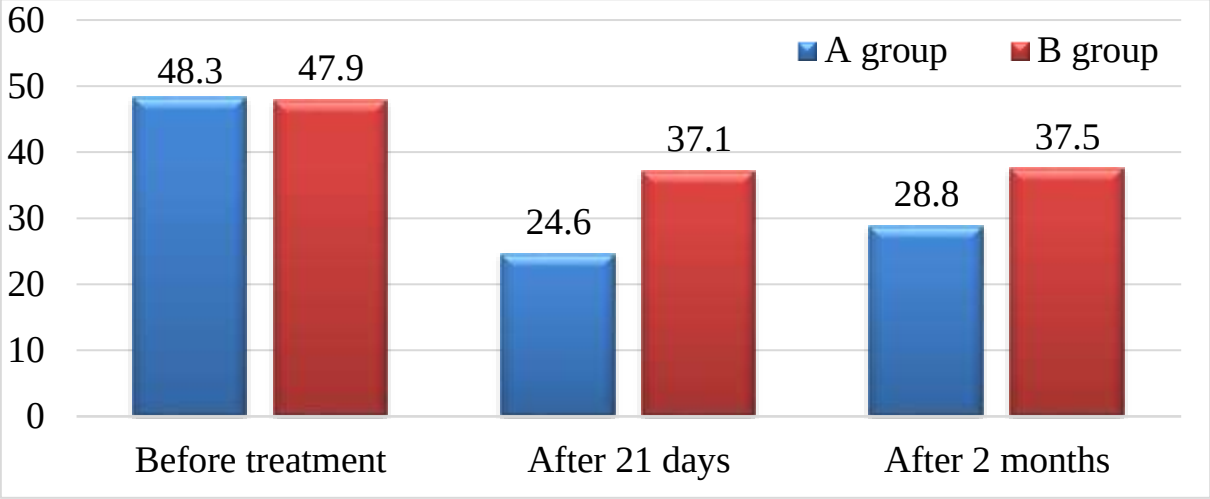
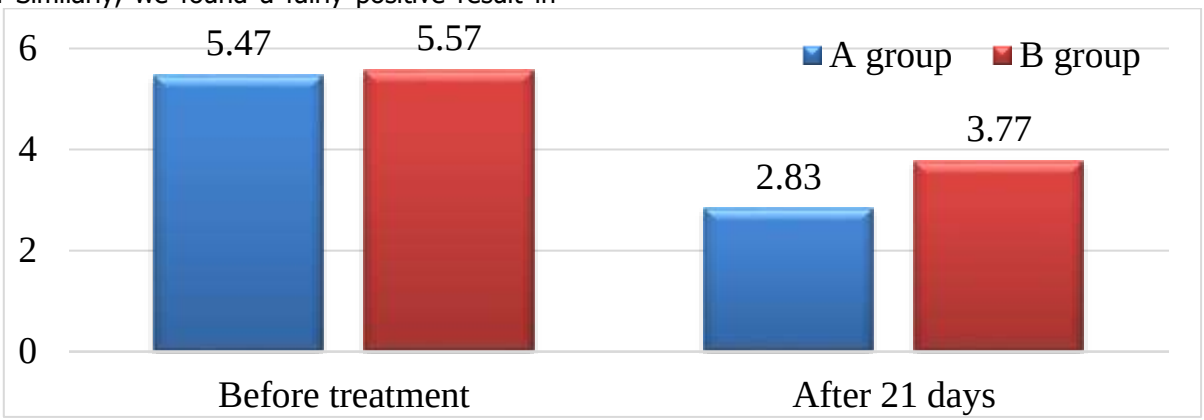


Rice. 7. Results before and after treatment of patients in groups according to the UPDRS scale.

According to the results of a comparative analysis of patients from both groups participating in the study, according to a unified Parkinson's disease assessment scale before and after treatment, we see that in the results of the questionnaire on the 21st day of treatment and 2 months after treatment, the symptoms of the disease in group A participants shifted significantly to the positive side.

In Group B, questionnaire scores 21 days post-treatment did not change significantly from pre-treatment scores, and follow-up results at two months showed that patients experienced worsening symptoms (Fig. 7). Similarly, we found a fairly positive result in daily motor symptom expression (UPDRS) in the TMS group. The study revealed positive changes in the manifestation of bradykinesia and other motor symptoms in the clinical course of the disease, due to the stimulating effect of TMS therapy on the M1 cortex area (part III of UPDRS).

We measured the DN4 questionnaire scores before and 21 days after treatment, after TMS sessions and discontinuation of Pregabalin. According to the analysis of the results obtained according to the DN4 questionnaire, we saw a positive effect of treatment procedures by 1.8 times (Fig. 8).



Rice. 8. Results before and after treatment of patients in groups according to the DN4 questionnaire.

As can be seen from the results of the chart, prior to treatment, depression was observed at a high level in both groups. A week after the start of TMS, positive results began to be observed in both groups, for example, group A had 46.8 ± 1.2 points on the Beck scale before treatment, and after the first week of treatment - 32.6 ± 1.6 points, after the second week of treatment the level of depression decreased even more - 26.1 ±1.1 points, and after the end of treatment, when re-analyzing the results on the Beck scale, the result was 20.9 ± 1.4 points, indicating that TMS therapy can reduce depression in Parkinson's disease, showing a significant positive effect on the treatment process ($p<0.001$). (Fig. 9)

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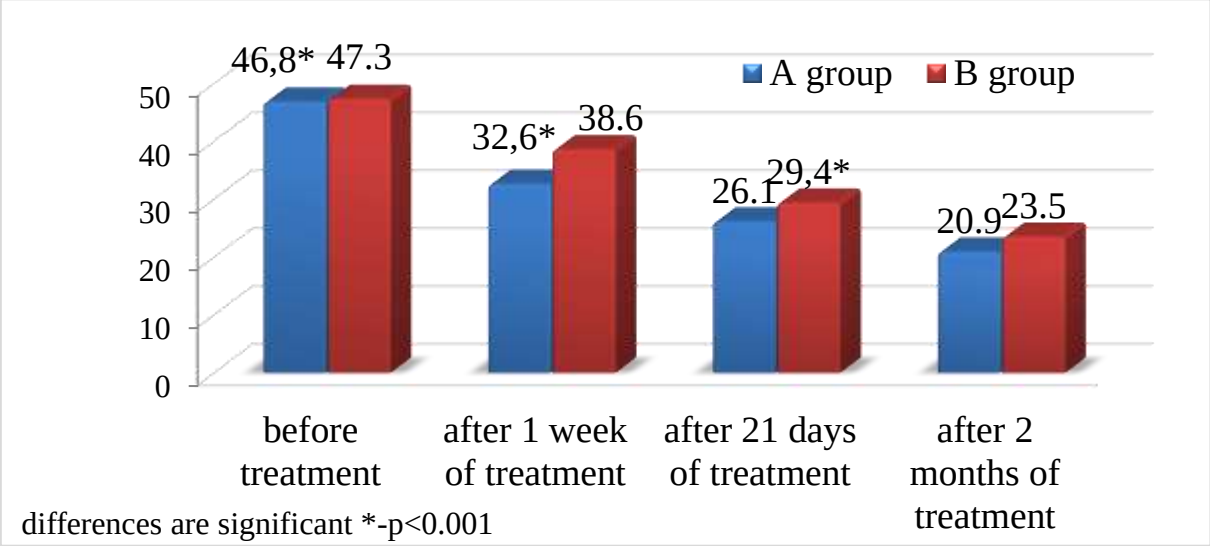

Rice. 9. The level of severity of depression before and after treatment in the main group of patients

In patients of group B before treatment, 47.3±2.2 points were detected, after the first week of treatment - 38.6±1.3 points, in patients after the second week of treatment - 29.4±2.1 points when analyzing the Beck scale. Treatments in patients were determined on average by 23.5±2.2 points and significant positive dynamics was noted (p<0.001).

Thus, the effect of TMS, in particular, on the vegetative state, emotional disorders, depression, made it possible to achieve more significant results. Patients treated with TMS experienced a significant reduction in pain. The effect persisted even after the end of treatment. In relation to the emotional state, more significant results were achieved, not only in the treatment of anxiety, but also depression.

Based on the above review of the literature, scales for assessing depression, clinical neurological and anamnestic data, it can be said that the recommendation of TMS as an adjunct to the main treatment cures depression and pain in Parkinson's disease, and also has a significant positive effect on the treatment of the disease, improves the quality of life of the patient, creates comfort for both the patient and his relatives.

CONCLUSION

High-frequency rhythmic transcranial magnetic stimulation reduced motor activity by 32 points (28%) (p<0.05) and daily activity by 6.0±0.5 points (24%) (p<0.05) due to tremor and hypokinesia according to UPDRS, it also led to to a decrease in the severity of both myofascial and central pain syndrome according to the visual analogue scale by an average of 4 points (56%) (p<0.05), and the severity of depression according to the Beck scale at any stage of the disease decreased by 8 points (45%) (p<0.05). The effectiveness of transcranial magnetic stimulation in relation to motor and non-motor symptoms was maintained even 3 months after the course of treatment.

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