HIPPOTHERAPY IN REHABILITATION FOR MULTIPLE SCLEROSIS

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ABSTRACT

The term hippotherapy refers to physical therapy treatment based on the "one patient-one horse" principle, interpreting it as riding and communicating with a horse. The objectives of hippotherapy include: regulating muscle tone (reducing spasticity), improving peristalsis, improving breathing, strengthening trunk muscles, improving balance and coordination, and improving walking control.

The aim of the research

The work investigates methods to improve patients' quality of life with Multiple Sclerosis (MS).

MATERIALS AND METHODS

Analysis of the literature and a clinical case of a 52-year-old female patient with multiple sclerosis who underwent a single course of hippotherapy. The efficiency of hippotherapy monitored using the following tests, questionnaires and scales: Bristol Fecal Form Scale, Wakefield Self-Assessment and Depression Scale, Spielberger-Hanin Self-Assessment Scale, SUN Questionnaire, Hamilton Anxiety Assessment Scale (HAM-A), Hamilton Depression Assessment Scale (HAM-D), Hospital Anxiety and Depression Scale (HADS), Beck Depression Scale.

RESULTS

The patient had positive results on tests, questionnaires and scales, as well as on subjective self-perception. According to the subjective opinion of relatives, by the end of 15 weeks of hippotherapy courses, the level of spasticity in lower limbs decreased, which made it easier for her to care, the appetite and pelvic functions had improved, the need for symptomatic therapy by taking laxatives for dehydration, (taking analgesics from nonsteroidal anti-inflammatory drugs, myorelaxant GABB-stimulator) had reduced approximately by half. According to the Bristol stool scale, when lactulose used for a long time, stool type changed from the first to the third. Spasticity scores on the Ashworth scale did not change during the hippotherapy course, but after the 7th week, the patient stopped taking nonsteroidal anti-inflammatory drugs before the hippotherapy session to relieve pain caused by constantly high muscle tone.

CONCLUSION

The clinical case demonstrated the effectiveness and necessity to consider hippotherapy in the course of medical rehabilitation and psychosocial support of patients with multiple sclerosis not only with its mild forms
but also with its severe forms, as in the presented observation due to the improvement of the general state, reduction of spasticity, improvement of well-being.

**Keywords:** rehabilitation, multiple sclerosis, hippotherapy, Bristol Stool Forms Scale.

### I. INTRODUCTION

Neurogenic Bowel Dysfunction (NBD) is a common condition among patients with multiple sclerosis, affecting 39% to 73% of patients overall, depending on the study population. Intestinal symptoms appear to correlate with EDSS and disease duration, but not with multiple sclerosis types. [7 - 11] Nevertheless, patients with low disability and short duration of disease may have bowel symptoms and, indeed, severe constipation has been reported as the first symptom of multiple sclerosis [12].

Constipation usually depends on individual perception and usually refers to infrequent bowel movements and difficulty passing stools. Various symptoms such as fatigue, bloating, and abdominal pain may be present. However, constipation remains a symptom and not a diagnosis and defined by the Rome criteria 13 (Box 1), which must have been met within the past 3 months, with the onset of symptoms at least 6 months before a diagnosis of functional constipation [14].

Fecal Incontinence (FI) is the involuntary loss of stool or gas for at least 1 month [15]. It can occur unnoticed by the patient (passive FI) or be accompanied by the urgent urge of varying degrees (urge FI). As with constipation, it is clinically essential to determine the consistency of the accompanying stool.

Constipation is present in half of the patients with MS, and FI affects about 50% of patients at some point and is a persistent symptom in about 25% of cases. 8 Typically, constipation and urinary incontinence are combined with each other and alternate. Given that FI affects 2% of the population and constipation 2-20% 17, it is clear that bowel dysfunction is much more common in patients with MS than in the general population.

### II. MATERIALS AND METHODS

Here is a description of a clinical case. A patient 52 years old, weight 73 kg, diagnosed with multiple sclerosis in 2019-2020, was offered classes at the Bashkir Republican Hippotherapy Center to supplement a long-term course of treatment and rehabilitation. The first attack of MS in the form of retrobulbar neuritis was in 1987; since 1996, the disease acquired a secondary progressive course. Disabled of group 1 for 20 years. Heredity was not aggravated. Since 1998 our patient was treated with interferon beta 1B (Betaferon) at 9.6 IU p/k every other day plus central myorelaxant, GABA-b stimulant in dosage of 10 mg in the morning and 20 mg at night. As a laxative, lactulose at a dose of 45ml 667mg/ml daily. (In the neurological status swallowing disorders. The patient scored 5 points on the 5-point modified Ashworth Spasticity Scale and 9.0 on the EDSS scale before hippotherapy.

The patient underwent one course of hippotherapy - 12 sessions. Classes were held once a week in the wintertime outdoors. Hippotherapy was conducted in the rhythm of walking. The patient was in the upright sitting position on the horse (Fig. 1) and the horizontal lying position on the back and on the stomach during the movement. The instructor exercised active participation and control. Two attendants to the right and left of the horse ensured safety. The effectiveness of hippotherapy was monitored using the following tests, questionnaires and scales: Bristol Fecal Form Scale, Wakefield Self-Assessment and Depression Scale, Spielberger-Hanin Self-Assessment Scale, SUN Questionnaire, Hamilton Anxiety Assessment Scale (HAM-A), Hamilton Depression Assessment Scale (HAM-D), Hospital Anxiety and Depression Scale (HADS), Beck Depression Scale, as well as emotional changes in condition, and comments from relatives who live directly with the patient. All tests, questionnaires and scales were administered 3 times: before hippotherapy, during the 7th session, and after the 12th session of hippotherapy.

### III. RESULTS

Stool type on the Bristol Stool Form Scale changed from type 1 to 5 in the first 7 days of training; due to this, there was an adjustment of the lactulose dose to 30ml, after changing the lactulose dose, the stool type on the Bristol Stool Form Scale was 4. Changes on the Spielberger-Hann Self-Assessment Scale were positive, with a decrease in reactive anxiety compared with the results before hippotherapy (39 points before hippotherapy course, corresponding to moderate anxiety, 37 points after 7 weeks and 29 points after 15 weeks, corresponding to low

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anxiety) and personality anxiety (48 points, corresponding to high anxiety, before hippotherapy course, 45 points after 7 weeks, which remained the same at 15 weeks, corresponding to moderate anxiety). Since personal anxiety was a qualitative characteristic of the personality formed during the individual's socialization, it was less dynamic than situational anxiety.

The Wakefield Depression Self-Assessment Scale showed a smooth decrease in depression scores, but the threshold of having or not having depression of 15 points not pointed. This scale was highly valid in measuring the degree of chronic stress. In this case, there could be a Pygmalion or Rosenthal effect, a psychological phenomenon, which implied that a person, on a subconscious level, built a line of behavior based on the opinions and expectations of others. The patient, who was ill for 20 years, took care of herself and built a specific role position. These psychodiagnostic instruments had such a disadvantage as an obvious direction of questions for the respondent, which often formed the need to look in the experimenter's eyes in a certain desirable way. The dynamics of changes according to the SUN questionnaire showed valuable results. A sharp increase in scores in the mood section from 2.3 to 4.9 (4.9 being close to a healthy person). There was a 0.1 point decrease in the activity section, which could be since the last interview conducted immediately after the session, and there was physical fatigue. Also, by the 15th week, the patient's mood had increased dramatically from 2.4 points after the 7th week of hippotherapy to 3.5 points.

When analyzing the functional state, the values of its indices and their correlation were essential. Changes in patient's anxiety and depression scores according to the Hamilton Anxiety Assessment Scale (HAM-A) showed a quantitative decrease from 32 to 22 scores during hippotherapy. On the Hamilton Depression Assessment Scale (HAM-D), there was a significant decrease in depression from a score of 28, corresponding to severe anxiety disorder, to a score of 11, corresponding to mild depressive disorder. The Hospital Anxiety and Depression Scale (HADS) scores showed decreased depression and relatively stable anxiety scores. The data compared to the Wakefield Depression Self-Assessment Scale in a positive trend of improvement in emotional well-being. The results of the Beck Depression Scale also confirmed the positive influence of hippotherapy on the clinical manifestations of depression in the form of a decrease in the severity of symptoms of depressive disorder. According to the subjective opinion of relatives, by the end of 15 weeks of hippotherapy courses, the level of spasticity in the lower limbs had decreased, which facilitated care, improved appetite, pelvic functions, the need for symptomatic therapy (taking pain-relieving drugs from the group of nonsteroidal anti-inflammatory drugs and muscle relaxants, GABAB stimulator) approximately twice decreased. Objectively, Ashworth's spasticity scores did not change during the course of hippotherapy, but after week 7, the patient stopped taking nonsteroidal anti-inflammatory drugs before the hippotherapy session to relieve pain caused by persistently high muscle tone.

**IV. DISCUSSION**

In this clinical case, a positive effect of hippotherapy on quality of life and other MS-specific symptoms, such as fatigue and spasticity, was registered. As a result of the hippotherapy course, the patient's quality of life improved, her motivation for rehabilitation measures increased, and her pain decreased. Many foreign authors described similar results with decreased spasticity, decreased feeling of fatigue, increased mood, motivation, and setting new goals in life [8, 14, 17]. In addition, positive effects of hippotherapy on quality of life and other MS-specific symptoms, such as fatigue and spasticity, could be found. First of all, it is essential to improve the patient's quality of life, increase his motivation for a favorable outcome of the disease, reduce pain and provide quality symptomatic therapy. Hippotherapy, in this case, in our opinion, is a solid psycho-emotional factor, which was the trigger mechanism of reparative changes in the body. Many authors also noticed a decrease in spasticity, decreased fatigue, increased mood, motivation, and new goals in life [13,14,15,16]. Experts in psychiatry and psychology also pointed to exercise to treat depressive disorders[17].

Moreover, hippotherapy was physical exercise and animatherapy and mechanotherapy, and associated with psycho-emotional factors and used to treat depression as a combined technique. Also, during 7 weeks of hippotherapy, the patient's relatives noted improvement of digestion, faster acts of defecation. If before the acts of defecation took up to 3 hours when using 45ml of lactulose 667 mg/ml, at the time of writing this article, the act of defecation lasted up to 1 hour, at night there was a decrease in spasticity if earlier relatives of the patient had to wake up at night 3-4 times to put the patient. When writing this article, relatives noted a decrease in pain at night and a more peaceful sleep. There was also a visual reduction in swelling of the lower extremities, hands, and face.
V. CONCLUSION

We interpreted the data obtained after quantitative assessment of health indicators and psychological tests in the clinical case under consideration, indicating the clinical benefit of hippotherapy for patients with multiple sclerosis. The combined effect of such factors as a new place of stay, new acquaintances, interaction with the horse, people at the racetrack, and physical exercises had a motivational effect. The use of hippotherapy could improve the overall quality of life of both the patient with multiple sclerosis and those involved in the care of this patient. The clinical case under consideration demonstrated the effectiveness and necessity of the broad involvement of hippotherapy in the course of medical rehabilitation and psychosocial support of patients with multiple sclerosis, mild forms of the disease, and severe ones in the presented observation.

We interpreted the data obtained after evaluating the charts as results of general benefit to patients with MS and noted a decrease in fatigue, depression, decreased spasticity of muscles, and increased mood and new goals in life, after a course of hippotherapy, which was especially good for patients with MS.

CONFLICT OF INTERESTS AND CONTRIBUTION OF AUTHORS

The authors declare the absence of apparent and potential conflicts of interest related to the publication of this article and report on each author's contribution.

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