
Application of Modern Technologies in Rehabilitation

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Annotation: This article analyzes the effectiveness of modern methods of rehabilitation of stroke patients, we studied the data of domestic and foreign scientific sources. As a result of the work carried out, a number of techniques with the greatest evidence base were identified, as well as techniques with unproven efficacy and not recommended for use to improve the function of the upper limb in patients with stroke were established. Let's consider them sequentially. The patient's quality of life largely depends on the degree of restoration of the lost functions. In turn, the degree of their recovery depends on the timing of the beginning; dosage and continuity of the initiated rehabilitation measures. The statistics continue to indicate that cerebrovascular diseases remain one of the most important medical and social problems of modern society. Rehabilitation of cerebral stroke, despite effective diagnosis and quality treatment, is not always effective enough, partly due to the fact that the patient rehabilitation system in our country is not sufficiently developed. At the same time, over the past decade, developments based on the use of digital technologies, computerized systems and robotic devices have been added to the traditional methods of rehabilitation.

Keywords: rehabilitation, stroke, recovery, upper limb, recommendations, rehabilitation methods, evidence.

Relevance : More than a million people live in our country who have had a stroke, and more than 650 thousand new cases of this disease are registered annually. The majority of patients who have suffered intracerebral bleeding, domestic independence is not restored, and therefore more than 85% of people of working age become disabled. The leading factor of disability in a significant number of patients is movement disorders - in the chronic stage of the disease, a symptom of brain damage is the same as in the acute one. In the acute stage, they are detected in 70-90% of patients, after a year the residual defect remains in at least half of the survivors.

Purpose: to analyze the effectiveness of modern methods of rehabilitation of stroke patients, we studied the data of domestic and foreign scientific sources. As a result of the work carried out, a number of techniques with the greatest evidence base were identified, as well as techniques with unproven efficacy and not recommended for use to improve the function of the upper limb in patients with stroke were established. Let's consider them sequentially.

Research methods Subject of research: rehabilitation of stroke patients Subject of research: the influence of modern technologies (video training) on the quality of rehabilitation of stroke patients. The study involved 20 men, aged 45-50 years, who had stroke 1 month ago and were discharged for follow-up treatment to the outpatient center at the place of residence. According to the conclusion of the neurologist, all patients had the same impairment of motor function - paresis of the left arm with an assessment of muscle strength of 2 points (pronounced paresis). The subjects were divided into 2 equal groups. The first underwent rehabilitation only in the clinic. The second - in addition to classes in the clinic, received a disk for classes at home, compiled together with a rehabilitation therapist. A video lesson was presented on the disk, according to which patients were taught to independently perform the

necessary exercises. After 1 month, the patients underwent a second examination by a neurologist, the results of which revealed: 1. In the group of subjects who underwent rehabilitation only in the polyclinic, 8 patients at the time of the second examination had paresis of the left arm with an assessment of muscle strength of 3 points (moderate paresis) and 2 patient at 3-4 points. 2. In the group that worked additionally at home, using a video lesson, 7 patients had paresis with an assessment of muscle strength of 4 points (mild paresis) and 3 patients completely restored movement in the arm and muscle strength. Currently, there are various robotic devices for mechanotherapy. Modern mechanotherapy devices are used to facilitate movement and increase mobility in the joints, as well as to train certain muscle groups. The most evidence-based basis is the use of such devices as Lokomat, Erigo and Primus complexes. The importance of electromechanical devices or robotic technology for improving upper limb function in stroke patients has been reviewed in 11 studies, 10 RCTs (218 participants) and 7 RCTs, as well as in 120, 52 and 67 patients. They demonstrate that, compared with any other procedure, using electromechanical devices or robotics, it is possible to significantly improve the motor functions of the hand. An increase in arm strength after training with the use of electromechanical or robotic devices has been proven, while no side effects have been identified. Evidence from systematic reviews suggests that the effectiveness of such therapy may depend on the area of the upper limb (shoulder or elbow) that is being addressed. Along with a beneficial effect on the indicators of strength, endurance and work of the upper limb, mechanotherapy has a positive effect on microcirculation and main blood flow in the basin of the cerebral arteries. It has been shown that the hardware restoration of complex spatial movements of the upper limb in the long term after a stroke increases the functional capabilities and everyday independence of the patient. Canadian authors do not consider it optimal to use exclusively robotics in the rehabilitation program. Nevertheless, they indicate a high efficiency of restoration of the motor function of the paretic shoulder and elbow in patients with stroke when conducting exercises with the use of robotic devices as additional procedures due to frequently repeated tasks with minimal medical supervision. There were no statistically significant differences between the groups of patients treated with robotic technology and those treated without it in regards to the restoration of motor function and skills in daily activities, an increase in strength and improvement in movement control.

Conclusion: rehabilitation of patients after a stroke requires the organization of a complex system of care with the obligatory consideration of the specifics, clinical features and variants of the course of the disease. Along with numerous approaches to the rehabilitation of patients, new ones are being created, which have shown their effectiveness in the recovery of patients. The use of modern technologies, for example, a video lesson, improves the quality of rehabilitation of stroke patients and helps to speed up the recovery process. The discussed works differed in terms of quality, type and duration of procedures, conditions for their implementation (on an inpatient or outpatient basis), duration of classes, measuring instruments (tests, scales, questionnaires, etc.) and evaluation of results. Most of the studies were conducted in patients who had a stroke more than 6 months ago and completed standard rehabilitation. It noted statistically significant improvements in the function of the upper limb at periods from 3 to 9 months after a cerebral accident.

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