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MEDICAL REHABILITATION OF PATIENTS WITH ACUTE DISORDERS OF CEREBRAL CIRCULATION: LITERATURE REVIEW

**Jasur Alimjanovich Rizaev, Prof, DcS,
Khaydarov Nodirjon Kadirovich, Phd**
Tashkent State dental institute
dildora_doktor@mail.ru



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Abstract: The main target of rehabilitation in stroke is the recovery of impaired functions and lost motor skills of the patient for his physical and social adaptation. Neurophysiological basis of rehabilitation is the plasticity of the central nervous system, which can be quite high. There are three possible levels of motor recovery: the level of recovery, compensation and readaptation. In this article, authors reviewed literatures related to this topic and faced significant issues in the treatment and rehabilitation of stroke.

Keywords: rehabilitation; stroke; acute disorders of cerebral circulation; impaired function; paralyzes, thrombosis.

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INTRODUCTION

The main goal of rehabilitation in stroke is the restoration of impaired functions and lost motor skills of the patient for his physical (self-service) and social (work activity) adaptation. The goals and objectives of VL depend on the severity and nature of damage to the nervous structures, because some foci are in the stage of destruction, others - in a state of reduced activity

or inhibition (the so-called "sleeping neurons", "ischemic semitenes"). Rehabilitation activities should be aimed at restoring complex neurological syndromes: motor, sensory, speech, cognitive, etc. [1].

Neurophysiological basis of rehabilitation is the plasticity of the central nervous system, which can be quite high. It can be implemented on:

- molecular-genetic level, when the phenotype of nerve cells changes

under the influence of constant stimulation in the course of rehabilitation activities.

- functional level, when under the influence of external stimuli in the process P, a functional reorganization of the cortex takes place due to the formation of new interneuronal connections.

There are three possible levels of motor recovery (LG Stolyarov and GR Tkachev, 1978) [1, 13]:

1. The level of recovery, which is reached in the early periods (the first 3-6 months) after a stroke due to the restoration of damaged nerve structures in the area of the lesion. This occurs as a result of the elimination of edema, inflammation, metabolic disorders, followed by remyelination, regeneration of nerve fibers, or the reorganization of inter-neuronal connections. These recovery mechanisms occur in each patient.

2. The level of compensation with the inclusion in the performance of impaired functions of those structures and systems of the brain that previously did not participate in their implementation, including through the contralateral motor cortex and corticospinal systems.

3. Level of readaptation, ie, adaptation to a defect, if it is not eliminated. Recovery in this case is due to the use of surviving nerve structures involved in the regulation of movements (subcortical structures, cerebellum, trunk and spinal structures). In this way, most patients recover spontaneously. However, this reconstruction

mechanism is always realized with the formation of pathological synkinesis, pathological poses and tonic reflexes [1].

With a view to conducting successful rehabilitation, it is necessary to start rehabilitation activities as soon as possible, observing the consistency, continuity and continuity of the medical measures, to use the complexity, i.e. to apply all means of medical and social-labor rehabilitation, taking into account in each case the rehabilitation potential of the patient. The program of medical rehabilitation should be performed in a hospital, polyclinic, sanatorium or at home [1, 2].

When determining the measures and their nature in stroke, it should be remembered that the recovery of disturbed functions after a stroke occurs most intensively during the first 6-12 months. after the end of the acute period. The rate and degree of recovery are determined by the nature of the vascular process (hemorrhage, infarction), the severity of the defeat of various functions and the course of the disease [3, 4]. Restoration of functions depends on timely and properly organized treatment, which provides for an early restoration of blood supply to the affected parts of the brain, neuroprotective therapy and undifferentiated therapy aimed at restoring vital functions and maintaining homeostasis. Therefore, one of the primary objectives of therapy is to act on inhibited elements of nervous structures and return them to functional activity.

During the stroke, there are [5]:
The acute period is from several days to 3-4 weeks, until the first signs of the reverse development of the process show up and the direct threat of life is not eliminated.

Early recovery period - from the moment of appearance of the first signs of recovery to 3 months - the period during which the most significant (from possible) restoration of functions takes place. This period determines the clinical prognosis and rehabilitation potential.

Late recovery period - from 3 months to 1 year - in this period there is a further, but slow and small restoration of functions.

The consequences of a stroke - after 1 year. In this period, adaptation to the defect occurs. Distant consequences - in 3 years from the onset of a stroke.

In patients with cerebral stroke, the following disadaptive syndromes occur (level 1 of the consequences of the disease), which must be taken into account in the course of rehabilitation treatment:

1. Motor. Features of motor disorders in hemiplegias reduced to the following: contralateral paralysis of the extremities, spastic hypertension of the flexor muscles of the upper and extensors of the lower extremities, increase of tendon reflexes, absence of abdominal reflexes, appearance of pathological and protective reflexes [6].

In an acute period, in some cases, a pronounced syndrome of sluggish hemiplegia may appear, in

other cases tonic spasms arise, and sometimes an early contracture without tonic spasms, which remains such or goes on to hypotension in the future. With capsular hemiplegia, violations of the motor functions of the upper limbs are always more distinct than the lower ones; paralysis of the distal parts is more pronounced compared with the proximal ones; the function of the lower extremities and proximal parts of the upper, performing rough movements, is weakened and is restored more quickly than the function of the distal parts of the upper limbs, which carry out more subtle movements [7].

In the acute period after the onset of paralysis, hypotension of the affected muscles is usually observed and the tendency to external rotation of the hip joint is observed [2, 8].

In the recovery period, muscle hypotension is gradually replaced by spastic hypertension, unevenly expressed in various muscle groups, most emphasized in flexors, adductors and hand promoters and adductors of the hip joint, knee extensors and plantar flexors of the foot. Usually hemiplegic contracture develops as a result of uneven distribution of the degree of paralysis: the muscles that raise the scapula, shoulder abductors, extensors and flexors of the forearm, extensors of the wrist and fingers, abductors and hip flexors, knee flexors and dorsal flexors of the foot are most damaged. In view of the fact that the tone of the antagonists

of these muscles prevails, typical Wernicke-Mann contracture is formed: a hanging and reduced shoulder, penetrated and bent to the 90° forearm, hands and fingers bent in all joints, thigh, straightened and reduced, pronounced plantar flexion of the foot [5, 9]. Another impairment, which is directly related to changes in the motor sphere, is a disturbance of the reaction to equilibrium and difficulty while maintaining balancing in both the sitting and especially in a standing position. It should also be noted, observed in the period of recovery, together with the appearance of active movements in paralyzed areas, synkinesia or friendly movements. These pathological motor synergies are a significant motor obstacle in the recovery of strong-willed active movements. Severe patients with hemiplegia tend to lie on the injured side, as a result of which pressure ulcers may develop from compression, for example, in the region of the ankle, sacrum or trochanter [10].

2. Sensitive disorders. To restore motion, the degree of sensitivity impairment plays a big role, which plays the role of a proprioceptive stimulus, so necessary for the correct function of the motor analyzer.

3. Voice-speech disorders (observed in 75% of patients).

4. Visual impairment.

5. Violations of cognitive functions (observed in 60% of patients).

6. Psychopathological disorders (observed in 100% of patients).

Currently, the most physiological method of motor rehabilitation in neurological patients is the method of neuromotor re-training (Bobath, 1946) [8, 11]. The method bears the name of its creators - spouses from Czechoslovakia. Physiotherapist Berta Bobat, more than 50 years ago, proposed on the basis of her own experience and intuition a completely new approach to the rehabilitation of patients with spastic lesions. It began with successful attempts to identify positions that allow to slow down pathological reflexes. In turn, this contributed to the reduction of muscle tension and led to the feasibility of controlled movement. Over time, the experience was enriched and led to the development of a technique that neurophysiologist Dr. Carl Bobath, husband of Bertha Bobat, substantiated theoretically. After a while, the news of the technique spread from London around the world. At present, it is used as a neurodynamic method of recovery. The method proved effective in most types of infantile cerebral palsy (cerebral palsy). It also finds application in other types of lesions, especially with muscular tension disorders [7, 12].

The method has found application in brain injuries and central motor neurons, not only in cerebral palsy, but also in hemiplegia in adults. The method is based on the neurophysiological mechanisms of normally developing children and the pathological mechanisms of changes in the region of the motor sphere observed in cerebral palsy

under the influence of, first of all, suppressed tonic reflexes of the brain stem [6, 9, 13].

The most severe group consists of patients with stroke. Since motor disorders of different severity prevail in patients, even in the acute period of the disease, along with drug therapy, fighting with respiratory and cardiac disorders, treatment is used by the provision for the prevention of contracture development and the appearance of pathological synkinesis. In the early period after the onset of paralysis, the severity falls on the treatment through giving the patient the appropriate position and the inclusion of passive movements to protect from contractures and maintain normal trophism in the affected areas, in which spasticity has not yet replaced the initial lethargy [14].

The main goals pursued by treatment are [15]:

- suppression of increased tone and pathological reflexes;
- maintaining symmetry by alternately activating both sides of the trunk;
- Providing sufficient support (stability), which creates a sense of confidence and allows you to manipulate your hands;
- ensuring normal proprioception;
- encouraging the patient to realize the affected party both sensitively and psychologically;
- relief of pain and comfort;
- development and strengthening of the main components of the movement;

- creating prerequisites for postural adaptation;

- development of visual-motor coordination, since in the position on the side the patient sees his limbs.

Passive exercises should be performed 2-3 times a day, focusing on the movements that counteract the formation of contractures in individual joints. Exercises should be slow, smooth and unsharp, along the physiological axis of the movement, in full and downward direction - from the proximal to the distal joints [16].

In the first days of development of paralysis or paresis (with thrombosis - on the 3-4th day, with hemorrhages - on the 6th-7th day, with lesions of a large vessel - after 3 weeks) passive gymnastics is used in combination with massaging. Passive gymnastics reduces the risk of developing contracture, helps improve the conductivity of the nerve structures, improves blood circulation. At the end of the second week the patient is gradually prepared for walking. At the same time, p h a r m a c o t h e r a p y , psychotherapeutic measures and the appointment of physical factors continue [2, 17].

The criterion for prescribing therapeutic gymnastics is an improvement in the general condition, absence of arrhythmias, symptoms of right- and left ventricular failure. Physical rehabilitation is difficult in the presence of persistent arterial hypertension, diabetes, obesity, a significant decrease in hearing and

vision; in the disturbance of the psyche, when patients can not participate in rehabilitation. With frequent attacks of epilepsy and pelvic disorders, it is impossible. To prevent complications from the lungs, breathing exercises are used, which increase the mobility of the diaphragm. In an acute period, breathing exercises are performed without the participation of limbs and trunk movements. And only with an increase in the motor activity of the patient these exercises can be carried out in combination. With increased muscle tone, exercises begin with the development of large joints, turning to small ones, which prevents the development of syncopeesis. Active exercises begin with those movements that are most likely to occur (about a week) [5, 17].

Thus, in the early recovery period, therapeutic physical training is conducted in three directions with the use of position treatment, passive and active motions [18]. Based on the latter, walking and self-service are built. With increased muscle tone, there are violent movements (synkinesia) in the fight against which, a set of physical exercises designed to relax the muscles, point or segmental massaging is developed.

Active physical exercise can be applied several times a day, while avoiding the fatigue of paralyzed muscles. Therapeutic physical training should be carried out continuously throughout the recovery period of the disease. Restoration of motor function is more effective at a young age, as well as in patients who have experience of exercising before illness, with an unbearable anamnesis [6, 19].

Rehabilitation activities in stroke patients should begin as early as possible. Thus, when observing patients who started at 72 hours and those whose rehabilitation measures started 4 to 15 days after the onset of the disease, the first group revealed twice as many people who did not need outside help. Based on the idea of the significance of the amount of information from the afferent systems of the mechanoreceptors of the plantar surface of the feet in patients who have had a stroke, from the 3rd to the 7th day, along with other methods of treatment, vibration-stimulating footwear imitating an act of walking is used. This allows to activate the motor activity of the patient. Contraindications to this are increased or unstable blood pressure and myocardial infarction [3, 20].

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