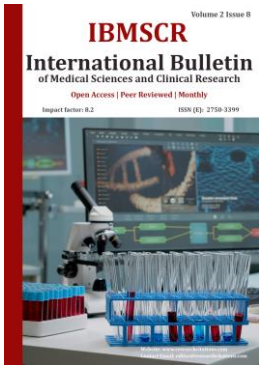

REHABILITATION OF PATIENTS AFTER STROKE

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Summary: Cerebrovascular disease, in particular stroke, ranks first place among the causes of disability. Proper rehabilitation of patients after stroke involves the correction of motor and cognitive impairment, as well as social adaptation. The article discusses the basic principles rehabilitation after a stroke, features of rehabilitation of patients with motor, speech and cognitive impairments. Discussing the use drugs that facilitate the rehabilitation process.

Key words: stroke, rehabilitation, cognitive impairment, motor disorders, speech function.

Cerebrovascular diseases occupy the first place among the causes of disability. Their share is constantly increasing, which is caused by the gradual growth of vascular brain diseases, an increase in the proportion of elderly people in the structure population. The desire to stop the growth of disability in the population is of interest to rehabilitation. Rehabilitation is a set of measures (medical, pedagogical, psychological, socio-legal and others), aimed at restoring
impaired as a result of illness and damage to functions and social readaptation
sick. In patients with the consequences of a stroke or other diseases and injuries, it is possible to distinguish three main types of violations [13]:

1) Damage, defect (impairment). Among the injuries that occur after a stroke,
motor (paresis, ataxia), cognitive, speech, emotional-volitional, visual, sensitive, bulbar and pseudobulbar (dysphonia, dysphagia, dysarthria), pelvic, sexual and other disorders, as well as complications in the form of epileptic seizures, falls, thalamic pain, urinary infections pathways, thromboembolic episodes, post-stroke arthropathies. Target rehabilitation - full or partial restoration of impaired functions, prevention, treatment and minimization of complications.

2) Disability. Ability impairment is expressed in walking disorder, self-care, defined as activity in daily life or violation of more complex everyday skills. Self service includes the ability to independently dress, eat, maintain personal hygiene,
use the bathroom and toilet, control the sphincters, exercise independent movement (with support on a stick, without a stick, on a wheelchair) within indoors and outdoors, sit down and get up independently. Ability to perform complex household skills may include assistance with cooking and cleaning the premises, shopping, working at their summer cottage, driving car, etc. The goal of rehabilitation is to teach walking and self-care skills.

3) Violation of social functioning (handicap). Violation of the social functioning is expressed in limiting the implementation of that social role, which before the disease was the norm for the patient (according to his age, sex, education, social status, profession, cultural level) and

includes limiting the social role in the family and society, limiting social contacts, restriction or inability to work.

The goal of rehabilitation is the restoration (full or partial) of a social role (which goes beyond the immediate medical rehabilitation) in the family and society, social contacts, opportunities to attend concerts, theaters, exhibitions, various social and religious events, restoration of old and development of new
hobbies (hobbies), rehabilitation.

There are 3 levels of recovery:

- true recovery - when the disturbed functions return to the original condition. This is possible only when there is no complete death of nerve cells, and the pathological focus consists of inactivated elements (due to edema, hypoxia, changes in the conduction of nerve impulses);
- compensation - functional restructuring, involvement in a functional system new structures;
- readaptation - the use of various devices in the form of canes, walkers, prostheses. Rehabilitation is based on neuroplasticity - the ability of the brain to change its functional and structural reorganization, the ability of its various
structures to be involved in different forms of activity.

The reorganization is based on such factors as:

- multifunctionality of neuron and neuronal pool [1];
- Hierarchy of brain structures and sprouting (germination and further anastomosis of nerve fibers) [9].

Important for understanding the possibility of recovery of functions after a stroke has the concept of "ischemic penumbra" developed over the past 25 years
(penumbra). Ischemic penumbra - the border zone surrounding the lesion, in
which neurons and other nerve elements are in functional inhibited but anatomically intact, and which are a potential source of restoration of impaired functions. Function of neurons in zone of ischemic penumbra can be restored by including collateral blood flow or with the help of reperfusion [11].

The main principles of rehabilitation are [6, 4]:

- Early start of rehabilitation activities. Early rehabilitation hinders development of complications of the acute period of stroke due to hypokinesia and physical inactivity (thrombophlebitis of the lower extremities, congestive pneumonia, etc.),
development and progression of secondary pathological conditions (spastic contractures, pathological motor stereotypes), the development of social and
mental maladaptation, astheno-depressive states.

Systematicity and duration, which is possible with a well-organized phased rehabilitation. The first stage of rehabilitation begins at angioneurological department, where the patient is delivered by an ambulance.

The second stage of rehabilitation is rehabilitation in a specialized rehabilitation hospital, where the patient is transferred after an acute period of stroke. Second phase may have different options depending on the severity of the patient and existing neurological deficit. The first option is a patient with a good
After the restoration of impaired functions, they are discharged for aftercare in the clinic at the place of residence or in a rehabilitation center. The second option is for a patient with severe neurological deficit is transferred to the rehabilitation department the same hospital where the patient was admitted. The third option is for a patient with moderate neurological

deficit is transferred to a rehabilitation center. Third stage rehabilitation - outpatient rehabilitation (or in a rehabilitation
departments of the polyclinic, or in conditions of rehabilitation at home - for severe, poorly traveling patients).
- Complexity and multidisciplinarity. Inclusion in the rehabilitation process
specialists of various specialties (multidisciplinary team):
neurologists, internists (cardiologists), if necessary, urologists, kinesitherapy (exercise therapy), aphasiologists (speech therapists or neuropsychologists),
massage therapists, physiotherapists, acupuncturists, occupational therapists, psychologists, social workers, biofeedback specialists, etc.
- Adequacy of rehabilitation measures - involves the preparation individual rehabilitation programs, taking into account the severity neurological deficit, stage of rehabilitation, state of the somatic sphere, the state of the emotional-volitional sphere and cognitive functions, the age of the patient.
- Active participation in the rehabilitation of the patient himself, his relatives and relatives.

It is necessary that specialists in kinesiotherapy, household rehabilitation, speech therapists and phase therapists explain to caregivers of sick relatives or carers the goals and methods of classes, explained the need for additional classes in the second half a day. The role of the family in teaching self-care skills is also great creating conditions for various activities.

The main neurological symptoms of a stroke, which require
rehabilitation are:
- motor and walking disorders;
- speech disorders;
- Cognitive impairment. Rehabilitation of patients with motor disorders According to the Register of the Research Institute of Neurology of the Russian Academy of Medical Sciences, by the end of the acute period hemiparesis is observed in 81.2% of patients (hemiplegia - in 11.2%, severe paresis – in 11.1%, mild paresis in 58.9%) [5].

In the acute period of a stroke, the main tasks of rehabilitation are:
- early activation of patients;
- prevention of the development of pathological conditions and complications associated with hypokinesia;
- Restoration of active movements.

If the patient has no general contraindications to rehabilitation measures (CHD with frequent attacks of angina pectoris, high poorly corrected arterial hypertension, acute inflammatory diseases, psychosis and severe cognitive impairment), then from the first hours and days they begin to conduct rehabilitation measures such as positional treatment (antispastic laying limbs), passive exercises and selective massage. Multicenter the AVERT study using evidence-based medicine [10] showed that the use of very early rehabilitation (in the first 14 days after the stroke) reduces the level of disability, reduces mortality, reduces dependence on surrounding, reduces the frequency and severity of complications and side effects, improves the quality of life of patients by the end of the first year after a stroke. Indication stabilization is used to activate patients and transfer them to a vertical position hemodynamic parameters, for the determination of which it is desirable to use ECG and BP monitoring.

With medium and small heart attacks and small limited hematomas (without breakthrough blood into the ventricles), the activation of patients can begin on the 5th day of the disease. At In this case, verticalizers are widely used, for example, the verticalizer of the ERIGO type (under the control of pulse and blood pressure). In parallel with patient activation and by transferring it to a vertical position, active therapeutic exercises are used to restore movements in paralyzed limbs, electrical stimulation neuromuscular apparatus. Along with the restoration of movements in the tasks of medical Gymnastics includes learning to walk and self-care elements. In recent years computerized orthotic robots (LOKOMAT) appeared, which at first
provide passive movements in the lower extremities, simulating a step. As restoration of movements, the proportion of the patient's active participation in locomotion increases.

At the end of the acute period of stroke (after 21 days), early recovery period (the first 6 months after the stroke), the main tasks which are: further development of active movements, overcoming synkinesis, spasticity reduction, walking improvement, stability training vertical posture. In this period, continue to use kinesitherapy, aimed at activating movements in the paretic limbs. Wide the method of biofeedback by electromyogram is applied. To suppress synkinesis, in addition to their conscious suppression, orthopedic fixation and special anti-friendly passive and passive-active movements [2].

To improve the function of walking, the patient is taught to walk first along the Swedish walls, then with a four-legged support, an ordinary stick, then without support (if it is Maybe). To improve the stability of the vertical posture, various types are used balance therapy. The main means of combating spasticity is the reception muscle relaxants. The most common are tizanidine, baclofen, tolperison.

Physiotherapeutic methods are also used (ozocerite and paraffin baths, cryotherapy, whirlpool baths for hands). With a pronounced local spasticity is treated with injections of botulinum toxin type A. Training self-care goes in parallel, starting with the acute period of a stroke, when active movement becomes possible. Learning begins with learning getting out of bed, washing, eating, dressing, putting on shoes, use of the toilet. Gradually, the scope of these actions expands: the patient learnsfold things, make the bed, use the refrigerator, the elevator, get dressed and go out, etc.

Rehabilitation is carried out against the background of adequate drug therapy, including:

1) Etiological therapy - antihypertensive, antiplatelet agents / anticoagulants with the aim of prevention of recurrent strokes.

2) Pathogenetic therapy, including metabolic and neuroprotective funds (cerebrolysin, nootropics, choline alfoscerate, actovegin, citicoline); antioxidants (mexidol, cytoflavin); vasoactive drugs (pentoxifylline, Cavinton) [5].

The main method of correcting speech disorders is rehabilitation classes speech, reading and writing, which are carried out by speech therapists-aphasiologists or neuropsychologists.

Speech rehabilitation is longer and lasts up to 2–3 years. Methods Rehabilitation training depends on the stage of rehabilitation. At an early stage, apply special "disinhibiting" and stimulating methods of restorative
learning [7].

Recovery of speech comprehension - understanding of individual words and recovery ability to understand situational speech, at the next stage - understanding out-of-situation phrases. In parallel, the patient learns to understand written speech. Stimulation of speech understanding occurs not only in the classroom, but also in the usual household contact. Restoration of one's own speech - learning to name individual objects and actions based on pictures, repetition of individual sounds and words, sentences and phrases. The next stage of recovery is dialogue. On the final stage is teaching a monologue (composing stories, retelling what has been read). In acute stage of the disease due to increased exhaustion, short classes (15–20 minutes each). In the future, the duration of classes increases to 30–45 min.

Speech rehabilitation is carried out against the background of drug therapy, which has an activating effect on the integrative functions of the brain. They include nootropics (piracetam), cerebrolysin, gliatilin.

Rehabilitation of patients with dysarthria dysarthria, a whole range of activities is carried out, including:

- gymnastics of the muscles of the pharynx and pharynx;
- gymnastics and massage of articulatory muscles;
- electrical stimulation of the muscles of the larynx and pharynx;
- exercises on pronunciation of individual sounds, words, phrases, tongue twisters.

Rehabilitation of patients with cognitive impairment after stroke Cognitive disorders often occur after a stroke and are manifested by impaired memory, attention, gnosis, praxis, decreased intelligence. attention to this aspect little is given to cerebrovascular accidents, despite the fact that cognitive violations largely determine the outcome of rehabilitation measures and the quality life of a patient after a stroke. Memory impairment developing after acute disorders of cerebral circulation, according to different authors, are observed in 23-70% of patients in the first 3 months after a stroke. By the end of the first year, the number patients with memory impairment decreases to 11-31%. So, according to I.V. Damulin [3], the incidence of cognitive impairment in stroke patients reached 68%.

The frequency of dementia in patients after a stroke is 26%, and, with age, it tends to increase [18].

In patients older than 60 years, the risk of dementia in the first 3 months after a stroke in 9 times higher than in individuals without stroke [14]. The frequency of non-dementia cognitive impairment is still big.

The cause of severe cognitive impairment and even dementia can be [15]:

-massive hemorrhages and extensive heart attacks;

- multiple heart attacks;

- solitary, relatively small heart attacks, located in the functional significant areas: anterior-medial parts of the thalamus and close to it areas, frontal lobes, parietal-temporal-occipital areas of the brain, mediobasal parts of the temporal lobe, pale balls.

Cognitive impairment or dementia due to functional infarcts significant areas, do not increase over time, but even decrease. So, according to N.N. Yakhno et al. [8] improvement of cognitive functions is observed in 1/3 of patients to the end of the acute period of stroke. The degree of regression is different and depends on localization of the infarction, its location in the dominant or subdominant

hemisphere, unilateral or bilateral lesion, the presence of a previous lesion brain that was asymptomatic before the stroke. Cognitive impairments that appear in connection with a stroke, may occur at different periods of time: immediately after a stroke (acute cognitive impairment) and in a more delayed period (delayed post-stroke CI), caused, as a rule, in parallel ongoing neurodegenerative (often Alzheimer's) process, activated due to increasing ischemia and hypoxia. Post-stroke cognitive impairment worsens the prognosis, increases mortality [12] and the risk repeated stroke three times, and also increase the severity of functional disorders after a stroke, significantly complicate rehabilitation.

It is widely used to correct cognitive impairment after a stroke metabolic and neuroprotective agents, drugs affecting neurotransmitter systems that correct cognitive, emotional-volitional and other mental disorders.

- Piracetam - improves metabolic processes in brain cells, changes the speed spread of excitation, improves cognitive processes, especially memory and attention. It is used at the beginning of the course in the form of intramuscular injections (5.0 ml
20% solution for 20–30 days) or with severe cognitive impairment IV drip up to 6 g for 2-4 weeks, and then inside at 2.4-4.8 g / day for 3-4 months.

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