

FEATURES OF EARLY REHABILITATION OF ISCHEMIC STROKE IN THE
BACKGROUND OF DIABETES MELLITUS

Ruziev F.G., Pulatov S.S.

Bukhara State Medical Institute

✓ *Resume*

The frequency of occurrence of ischemic stroke against the background of diabetes mellitus was studied. The frequency of occurrence and modern diagnostic methods are presented. The clinical effectiveness of the methods that make up the complex for early rehabilitation has been studied.

Key words: ischemic stroke, diabetes mellitus, early rehabilitation.

ОСОБЕННОСТИ РАННЕЙ РЕАБИЛИТАЦИИ ИШЕМИЧЕСКОГО ИНСУЛЬТА НА
ФОНЕ САХАРНОГО ДИАБЕТА

Рузиев Ф.Г., Пулатов С.С.

Бухарский государственный медицинский институт

✓ *Резюме*

Изучена частота встречаемости ишемического инсульта на фоне сахарного диабета. Приведены частота встречаемости и современные методы диагностики. Изучено клиническая эффективность методов, составляющих комплекс для ранней реабилитации.

Ключевые слова: ишемический инсульт, сахарный диабет, ранняя реабилитация.

ҚАНДЛИ ДИАБЕТ ФОНИДА ИШЕМИК ИНСУЛЬТ ЭРТА РЕАБИЛИТАЦИЯСИ

Рўзиев Ф.Ғ., Пулатов С.С.

Бухоро давлат тиббиёт институти

✓ *Резюме*

Тадқиқотда қандли диабет фонида ишемик инсультнинг учраш частотаси ва замонавий диагностика усуллари ўрганилган. Эрта реабилитация комплексини ташкил этадиган методларнинг клиник эффектлари ўрганилиб чиқилган.

Калит сўзлар: ишемик инсульт, қандли диабет, эрта реабилитация.

Relevance

Stroke is one of the most common diseases in the world. The incidence of stroke in different countries varies from 100 to 300 cases per 100,000 population per year [3,5,8].

Ischemic stroke (IS) is an acute violation of cerebral circulation (ACVA) with damage to the brain tissue, impairment of its functions as a result of obstruction or cessation of cerebral blood flow due to thrombosis, or embolism associated with diseases of the vessels, heart or blood system [7,11]. Among the main reasons for the development of IS, a number of conditions can be distinguished that contribute to early development, accelerated progression and a greater likelihood of serious complications of cerebral vascular diseases. The existing evidence base indicates that disorders of carbohydrate metabolism, namely diabetes mellitus 2, increase the severity of IS manifestations and

increase the likelihood of its recurrence in the next 10 years [13, 16, 21].

Diabetes mellitus (DM) has become epidemic in the population in recent decades: by 2025, according to WHO experts, the number of patients with this pathology is expected to increase to 380 million people in the world, of which more than 90% are type 2 diabetes. The main cause of mortality in type 2 diabetes mellitus is vascular, including cerebrovascular complications [13, 20].

The role of diabetes mellitus as a risk factor for the first stroke was demonstrated in a 55–84-year-old population based on a ten-year follow-up conducted in Framingham (USA) [19].

The leading and sometimes decisive role in the development of cardiovascular pathology, including IS, is played by disorders of the hemorheology of hemostasis [2]. They, as well as wound-manifesting

endothelial dysfunction, are an important link in the pathogenesis of the main complications of type 2 diabetes mellitus, including IS [20]. Microcirculation in the affected brain, and, consequently, the course of stroke, largely depends on the activation of blood cells and endothelium.

One direction and mutual potentiation of changes in their morphofunctional properties in IS lead to a deepening of disorders at the level of microcirculation.

The incidence of stroke in men with diabetes is 1.5-4 times, and in women - 2-6 times higher than in people of the same age without diabetes. In patients with diabetes over 65 years of age, stroke is the second most frequent complication of the disease (after coronary heart disease). The population risk of stroke due to diabetes (that is, the number of stroke cases that could be prevented if diabetes is completely cured) is 18% in men and 22% in women. On the other hand, the prevalence of diabetes among patients with IS is 11-43%, which significantly exceeds the corresponding indicators of the incidence of diabetes in the general population (4-6%). At the same time, diabetes is a risk factor for not only primary, but also repeated IS [13].

Patients with diabetes have a significantly increased risk of ischemic stroke. At the same time, the risk of developing hemorrhagic stroke in diabetic patients does not differ from that in the general population (or even somewhat lower). The ischemic / hemorrhagic stroke ratio in diabetic patients, according to a large epidemiological study, was 11: 1, while in the general population it was 5: 1.

Diabetes mellitus leads not only to a significant increase in the risk of developing IS, but is also accompanied by a more severe course and worse outcome of the developed stroke. Thus, the mortality rate of patients with IS and diabetes, both at the hospital stage and in the long-term follow-up, is 2-5 times higher than in patients with stroke without diabetes. It is estimated that 16% of deaths in men and 33% in women as a result of stroke are due precisely to the effects of diabetes and related factors [12].

Hyperglycemia is observed in 6-40% of patients with stroke. An increase in blood glucose levels in people with a stroke can develop for a variety of reasons. Thus, an increase in blood glucose levels can be explained by the so-called reactive, transient hyperglycemia in people without diabetes in response to severe stress. Hyperglycemia can be a manifestation of a previously diagnosed diabetes mellitus or a manifestation of diabetes in individuals with a previously undetected disease. Although in individuals with hyperglycemia, the course of

stroke is characterized by significantly increased disability and mortality, the direct role of hyperglycemia in this remains unclear. So, in the scientific literature, two possibilities are considered. Hyperglycemia can be a factor directly causing worsening of the course of stroke and increased mortality, or, on the contrary, it can be a parameter that only reflects the severity of the course of stroke, its type and location and does not independently affect the course of stroke [21]. The presence of diabetes in a patient increases the risk of cerebrovascular diseases and mortality mainly from ischemic stroke (IS) [16]. It is known that glycemic variability significantly worsens the prognosis in such patients, which leads to the need for accurate selection and adjustment of the type of antidiabetic pharmacotherapy [13].

To solve this problem, a group of researchers, having studied the following sources: Cochrane Stroke Group Trials Register (June 2010), CENTRAL (The Cochrane Library 2010, Issue 2), MEDLINE (from 1950 to 2010), EMBASE (from 1980 to June 2010), CINAHL (from 1982 to 2010), Science Citation Index (until 2010), and Web of Science (ISI Web of Knowledge) (from 1993 to 2010), studies that included 1296 participants (639 in the treatment group and 657 in the control group), came to the conclusion that maintaining the glycemic level from 4 to 7.5 mmol / L in the acute period of stroke in patients with diabetes did not improve the outcome; the risk of hypoglycemia and death increased significantly [19]. The optimal target blood glucose concentration in the acute period is still not entirely clear, and therefore Yatabe, T, Inoue, S, Sakaguchi (2017) [19] compared four different target blood glucose levels (<110, 110- 144, 144-180 and > 180 mg / dL) in terms of benefits and risks of insulin therapy. They included all studies from three systematic reviews and searched PubMed and Cochrane databases. The network meta-analysis included 18,098 patients from 35 studies. Target glycemic concentrations <110 mg / dL and 110-144 mg / dL were associated with a 4-9 fold increased risk of hypoglycemia compared to 144-180 mg / dL and > 180 mg / dL. However, there were no significant differences between target concentrations of 144-180 mg / dL and > 180 mg / dL. A network meta-analysis found no significant differences in mortality risk among the four target blood glucose ranges in patients, but showed that target blood glucose levels <110 and 110-144 mg / dL were associated with a higher risk of hypoglycemia than target levels 144-180 and > 180 mg / dL, thus proving that the target level of glycemia in the acute period should be 7.8-10 mmol / L [21]. It is known that the most frequent consequences of stroke are movement disorders in

the form of various severity of paralysis and paresis [18]. To improve motor functions, non-drug methods such as acupuncture, manual therapy, methods of physical and physiotherapeutic rehabilitation are the most optimal [9, 10, 14].

In recent years, manual therapy (MT) methods have been widely used to treat patients in our country. There have been works showing the normalization of blood circulation in the vertebrobasilar basin using manual therapy in patients with extravasal compression of the vertebral artery [15]. There are special techniques of cranial osteopathy aimed at improving intracranial arterial and venous circulation, stimulating cerebrospinal fluid dynamics and normalizing the tension balance of the brain membranes [14]. The use of manual therapy as part of a complex of rehabilitation measures in the early period of stroke improves cerebral oxygenation in both the affected and intact cerebral hemispheres, allowing to achieve optimal cerebral perfusion in the acute period of the disease [15].

The complex application of the MT method in the acute period significantly reduces the terms of treatment and rehabilitation of patients. At the same time, the effectiveness of the combination of the methods of physiotherapy exercises and reflexology in complex rehabilitation treatment was noted [9]. In the first hours after the development of a stroke, along with posture treatment, passive and active exercises, differentiated massage techniques, patients are recommended to have neuromuscular electrical stimulation of the paretic muscles of the hand (they stimulate the extensor muscles of the hand and fingers of the affected hand for 20 minutes 2 times a day for 3 week). The use of this method in complex therapy has a positive effect on motor and functional recovery without deteriorating the state of cerebral blood flow and without increasing the infarction zone [10].

Also, a method of treatment has been developed that reduces the recovery time of lost functions in patients with ischemic stroke. This method is based on the simultaneous effect of dynamic electroneurostimulation (DENS) and reflexology. The use of the active apparatus DiaDENS-cardio in patients with hypertension makes it possible to achieve target BP values with a decrease in the drug load [10]. N.I. Strelkova recommends microwave therapy to patients with minor stroke or remaining neurological motor deficit. Studies have shown that under the influence of microwave therapy, regardless of the localization of exposure, there was an increase in the linear velocity of blood flow in the common carotid arteries with a decrease in asymmetry; collateral circulation developed, especially when exposed to the area of the brain.

Microwave therapy was also used for concomitant arterial hypertension, coronary artery disease, diabetes mellitus [2].

As the neurological symptoms decrease, the patient should be gradually prepared to stand up. Verticalization is a method of prevention and treatment of immobilization syndrome in patients who are in bed rest for more than 24 hours. The goal of verticalization is to ensure that the maximum level of mobility (gravitational gradient) is maintained against gravity, regardless of the patient's mental and motor status. Gravitational gradient is the maximum angle of verticalization without the development of orthostatic insufficiency [1, 6].

Immobilization syndrome is a complex of multiple organ disorders associated with non-physiological limitation of the patient's motor activity [4].

According to the static data of a number of authors, the incidence of immobilization syndrome reaches 80-90% in patients with acute cerebral insufficiency due to stroke, spinal and traumatic brain injury [17]. Therefore, early verticalization is one of the basic options for solving the issue of prevention and treatment of immobilization syndrome today.

Another common clinical manifestation of stroke is such a complex neuropsychiatric phenomenon as spatial ignorance, or neglect, manifested in the inability to respond to stimuli presented from the side opposite to the affected hemisphere.

The method is applied: "mirror therapy". The principle of operation of this method is as follows: the mirror is positioned so that the patient sees the reflection of a healthy limb, and the affected one disappears from the field of view.

Thus, there will be an illusory feeling that both legs or arms are working normally. The centers responsible for motor function in the cerebral cortex are activated, as a result of which the activity of the diseased limb improves.

The second most common post-stroke disorders are speech disorders. Aphasia is often accompanied by agraphia, alexia, and acalculia. The main method of rehabilitation for patients with aphasia is psycho-correctional classes conducted by a speech therapist-aphasiologist, or neuropsychologist. The most intensive recovery of speech occurs in the first 3-6 months. Speech restoration classes are conducted against the background of neurotrophic therapy [11, 17].

In 32% of stroke patients, severe depression develops, which not only spoils the patient's life, it significantly worsens the results of rehabilitation. Therefore, it is imperative to include in the

rehabilitation complex work with a psychologist, and if a drug correction is required, or even a psychiatrist's consultation.

Thus, in the early period, a multidisciplinary team should be included in the rehabilitation complex. This team should include specialists such as a neuropathologist, rehabilitation therapist, psychologist or psychiatrist. Rehabilitation should be started as early as possible, given the stability of the hemodynamic parameters. Gradually the patient is prepared for verticalization. All of these activities accelerate the stages of recovery. In the process of rehabilitation, concomitant diseases such as metabolic syndrome and diabetes mellitus play an important role. In connection with this, it is necessary to select drug therapy and additional methods of physiotherapy, exercise therapy for the correct rehabilitation of the underlying and background pathology. In conclusion, we can safely say that the key to a successful rehabilitation program is the early start of rehabilitation activities.

LIST OF REFERENCES:

1. Anisimova L.N., Polyakova A.V., Shchedrina N.S. The influence of apparatus verticalization on systemic and cerebral hemodynamics in patients in the acute period of ischemic stroke // Materials of the X All-Russian Congress of Neurologists with International Participation, Nizhny Novgorod. - 2012. - p. 13-14.
2. Bandakov M.P., Kovyazina G.V. Substantiation of the content of the method of physical rehabilitation of the consequences of stroke in different periods of the disease // Bulletin of the Vyatka State University for the Humanities. - 2011. - No. 1. - S.90-94.
3. Gafurov B.G., Amanova N.Z., Mastibekov N. Evaluation of the effectiveness of reflexotherapy in patients with ischemic stroke in the acute period with various types of cerebral hemodynamics // Doctor-graduate student. - 2010. - T. 43. No. 6. - S.66-71.
4. Epifanov V.A., Epifanov A.V. Rehabilitation in neurology - M.: GEOTAR-Media, - 2015. - 251c.
5. Isaikin A.I. Pathogenetic aspects of ischemic stroke therapy // Difficult patient - 2010. - T. 8. No. 4 - P.21-24.
6. Clinical guidelines. Verticalization of patients in the process of rehabilitation // All-Russian Public Organization for Assistance to the Development of Medical Rehabilitation "Union of Rehabilitologists of Russia", Moscow. - 2 014. -- 58 p.
7. Lukyanov A.L., Skvortsova V.I., Ivanova G.E., Shamalov N.A. Verticalization of patients in the acute period of cerebral stroke // Journal of Neurology and Psychiatry. S. S. Korsakov. Stroke. - 2010. - No. 4. - S. 29-35.
8. Pulatov S.S. Clinical features and issues of differentiated treatment tactics for hemorrhagic stroke in elderly and senile age // Journal of Neurology of Siberia. - 2015. - P.61-71
9. Savelieva I.E. The effectiveness of the combination of physiotherapy exercises with reflexotherapy in medical rehabilitation of patients with strokes // Modern scientific research and innovations. - 2012. - No. 6.
10. Svintsova GA, Kobalava Zh.D., Bagmanova N.Kh., Kotovskaya Yu.V. Clinical efficacy of dynamic electroneurostimulation in the complex treatment of hypertension // Bulletin of the Peoples' Friendship University of Russia. Series: Medicine. - 2011. - No. 2. - S.93-98.
11. Sidiyakina I.V., Shapovalenko T.V., Lyadov K.V., Ivanov V.V. Questions of rehabilitation in the acutest period of stroke // Bulletin of restorative medicine. - 2011. - T. 117. No. 2. - P.9-13.
12. Tanashyan M.M., Lagoda O.V., Antonova K.V. Chronic cerebrovascular diseases associated with metabolic syndrome: new approaches to treatment. // Journal of neurol. and psychiatry them. S.S. Korsakov 2012; 11: 21-26.
13. Tanashyan M.M., Antonova K.V., Lagoda O.V. and other Acute disorders of cerebral circulation and type 2 diabetes mellitus. Annals of Clinical and Experimental Neurology. 2014; 8 (3): 4-8.
14. Tarnuev V.A., Nikolaev S.M., Kozhevnikov V.V. and other Oriental medicine. - Ulan-Ude: publishing house GBUZ RTsMP MZ RB - 2014. -- 440 p.
15. Shprakh V.V., Molokov D.D. Results of complex rehabilitation of patients with ischemic stroke using manual therapy // Siberian Medical Journal (Irkutsk). - 2014. - T. 129. No. 6. - S. 70-73.
16. Shustov S.B., Baranov V.L., Halimov Yu.Sh. Clinical endocrinology. / M.: MIA, 2012: 65–68.
17. Khasanova D.R. and others. Complex rehabilitation of patients with post-stroke syndromes / D.R. Khasanova, Yu.V. Zhitkova, I.I. Tabiev // Medical Council. - 2016.- No. 8.- P.18-23.
18. Khabirov F.A., Kochergina O.S., Rakhmatullina E.F. and other Organization of early rehabilitation of post-stroke patients

- with motor deficits // Kazan Medical Journal. - 2011. - T. 92. No. 1. - P.97-100.
19. Chen R, Ovbiagele B, Feng W. Diabetes and Stroke: Epidemiology, Pathophysiology, Pharmaceuticals and Outcomes. // Am J Med Sci. 2016;351(4):380-6. doi:10.1016/j.amjms. 2016.01.011.
20. Zhu Z., Zhou H., Yu X. et al. Potential regulatory role of calsequestrin in platelet Ca(2+) homeostasis and its association with platelet hyperactivity in diabetes mellitus. JThrombHaemost. 2012; 10 (1):102–104.
21. Yatabe T, Inoue S, Sakaguchi M. The optimal target for acute glycemic control in critically ill patients: a network meta-analysis. IntensiveCareMed. 2017;43:16-28. doi:10.1007/s00134-016-4558-2.

Entered 09.04.2021