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ASSESSMENT OF THE IMPORTANCE OF HEALING EXERCISE IN EARLY REHABILITATION IN ISCHEMIC STROKE WITH DIABETES MELLITUS

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Abstract: In the acute period of ischemic stroke, 80 patients with diabetes mellitus and 70 patients with undiagnosed diabetes were examined. All patients underwent subjective, objective, clinical-instrumental, and neuropsychological examinations. Patients are assessed for the importance of therapeutic exercise recommended in complex early rehabilitation.

Keywords: ischemic stroke, diabetes mellitus, therapeutic exercise, rehabilitation, neuropsychological tests.

Relevance According to world statistics, the incidence of stroke and the number of deaths resulting from it are increasing day by day. During the twentieth century, the incidence of stroke has steadily increased. (CP Warlow). About 30 million people worldwide are diagnosed with stroke each year, and about 75% of them are over 65 years old. In the United States, for example, 550,000 people are diagnosed with stroke each year. In European countries, it is an average of 220 per 100,000 population disease is detected for the first time. [1].

Acute cerebrovascular accident in the Republic of Uzbekistan in the analysis of the 10-year dynamic situation for 2011-2020.

while in 2012 it increased by 11.1 degrees to 60.6. In 2013, the incidence of stroke decreased by 52.0. In turn, growth was observed in 2014-2015. It should be noted that the second 5.

The incidence of stroke has declined sharply in the past year, reaching 7.6 per 100,000 population in 2016. There has been an increase in recent years, and by 2020 the incidence rate was 10.6. According to him, from 2016 to 2020, the incidence of stroke has increased. In particular, it was found that the incidence of the disease in older patients is increasing from year to year. [2].

When acute circulatory disorders in the brain occur in the background of diabetes mellitus, the state of glycemia is influenced by risk factors for the dynamics of neurological status. The mean stroke development in patients is 6.9 ± 5.2 years. [3].

There are opinions that very early rehabilitation plays an important role in the prevention of many organ system complications associated with inactivity, namely respiratory system pneumonia, atelectasis, circulatory disorders deep vein thrombosis, pulmonary artery embolism, immunosuppression, bed sores and muscle atrophy. There are views on the activation of regenerative processes to reduce the risk of mood swings, prevent stroke-related complications. [4]

In the acute period of a stroke from the first day the patient's condition and passive movements can be recommended. During treatment, the patient's condition is important, and the muscles prone to spastic contracture should be as stretched as possible and the attachment points of their antagonists should be close together.

Discomfort, pain, and other complaints are transferred to another state when they occur. During treatment during the day it is prescribed to change the patient's condition every 1.5-2 hours.

Therapeutic exercises Inactive therapeutic exercises on the paralyzed side, especially with the help of an instructor, alleviate the situation. Active and inactive exercises with separate parts of healthy and injured arms and legs include movements such as relaxation, breathing exercises, and changing body position in bed mode. [5].

Research objective: To study the importance and therapeutic aspects of therapeutic exercise in ischemic stroke with diabetes mellitus and in early rehabilitation in non-diabetic cases.

Material and methods

Results of examination and analysis of 150 patients diagnosed with acute cerebrovascular accident, ischemic type in the Bukhara branch of the Republican Scientific Center of Emergency Care, emergency neurology and neuroreanimation in 2020-2021 to address the scientific goals and objectives of our research. provided. Patients with ischemic stroke on the background of diabetes mellitus Group I (primary, basic) (BG) consisted of 80 patients, the ratio of women to men was 1: 1.1 and the average age was 62.3 ± 6.2 , group II (comparative, control) (CG) 70 individuals with no history of diabetes in the anamnesis and examinations, with a sex ratio of 1: 2.5 with a predominance of women and men, and an average age of 61.2 ± 6.9 .

Analysis and results

Patients in both groups were provided with first aid and therapeutic exercises were recommended in conjunction with standard treatment procedures. Patient status was assessed on days 1-2 and 7-10 of the study using the NIHSS and MRS (medical research council scale) scales .

Ultrasound brachiocephalic artery duplex scanning (UTDS) and brachiocephalic angiography (BTsA) examination methods

Brachiocephalic arteries UTDS examination BG n = 49, $61.25 \pm 6.96\%$, CG n = 57, 81.4 ± 5.15 patients, angiography examination n = 23, $28.75 \pm 9.44\%$ and CG n = 12, $17.1 \pm 10.88\%$ were performed in patients. Obstacles present in cerebral blood flow using brachiocephalic arteries UTDS and angiography methods, due to which changes in blood flow velocity and possible clinical signs may occur, were studied and compared.

Table 1 .

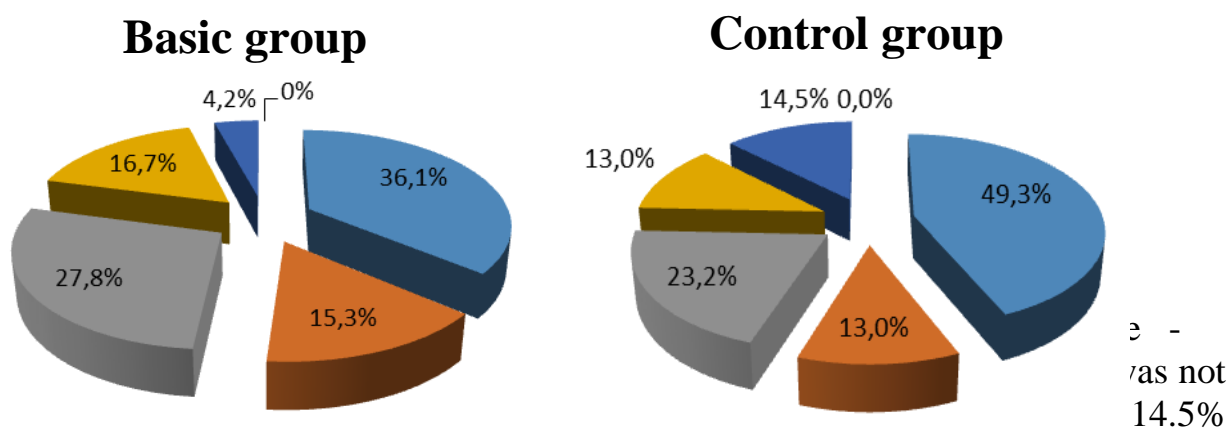
Indications for examination of the degree of stenosis of the brachiocephalic arteries by ultrasound duplex scanning and angiography.

Vessels		Basic group			Control group		
		n	%	M	n	%	M
Arteria carotis communis	right	30	41.7	14.7 ± 3.1	27	39.1	14.43 ± 2.4
	left	24	33.3	11.6 ± 2.7	17	24.6	7.61 ± 1.79
Arteria carotis externa	right	7	9.7	2.4 ± 1.4	3	4.3	1.97 ± 1.18
	left	8	11.1	2.9 ± 1.4	4	5.8	1.68 ± 0.84
Arteria carotis interna	right	11	15.3	5.6 ± 2.2	11	15.9	5.45 ± 1.6
	left	10	13.9	3.6 ± 1.6	8	11.6	4.16 ± 1.49
Arteria vertebralis	right	5	6.9	5.6 ± 2.2	3	4.3	1.3 ± 0.84
	left	4	5.6	3.6 ± 1.6	4	5.8	1.5 ± 0.76

of stenosis of the brachiocephalic arteries was examined by ultrasound duplex scanning and angiography .) Was observed in 11.6 ± 2.7 cases, in the control group 39.1% of cases were observed on the right side (27/69) , 14.43 ± 2.4% on the left side, and 24.6% (17/69) cases were observed on the left side, 61 ± 1.79%. In both groups, it can be observed that the stenosis is mainly located in the common carotid arteries. There are also cases of stenosis in the external and internal carotid arteries and spinal arteries, the results of which are presented in Table 1.

Figure 1.

Stenosis levels in UTDS examination according to NASSET and ECST classification .



and occlusion cases were not detected (Fig. 1).

MRI examination was performed in 7 patients in the main group and 8 patients in the control group, in 73 patients in the main group and in 62 patients in the control group. In the main group, where ischemic stroke was detected by MSKT, n = 43 lesion size was 2.76x1.99 ± 0.22 cm, n = 32 density was 20.0 ± 3.82 ED, and in the control group, the lesion size was 2.98x2.08 ± 2.59. cm², density 20.19 ± 3.77 ED.

1- table.

Indications for MRI and MSKT examinations.

Indicator	Basic group		Control group		p
	n	M ± m	n	M ± m	
MSKT	73	91.25%	62	88.60%	(p> 0.001)
MRI	7	8.75%	8	11.40%	(p> 0.01)
Subatrophy	58	72.5 ± 4.99	41	58.6 ± 5.9	(p> 0.01)
Atrophy	12	15 ± 3.99	8	11.4 ± 3.8	(p> 0.001)
Vascular and encephalopathy	76	95 ± 2.44	63	90 ± 3.8	(p> 0.01)
Ischemic stroke	45	56.25 ± 5.5	32	45.7 ± 5.9	(p> 0.001)

Cerebral subatrophy BG (58/80) 72.5 ± 4.99%, CG (41/70) 58.6 ± 5.9%, atrophy BG (12/80) 15 ± 3.99%, CG (8 \ 70) 11.4 ± 3.8 %, vascular encephalopathy BG (76/80), 95 ± 2.44 %, CG (63/70), 90 ± 3.8 %, intracranial hypertension BG (27 \ 80) 33.75 ± 5.29 %, CG (23/70) 32.8 ± 5.6 %. Diagnosis of ischemic stroke In the cases of BG (45/80) 56.25 ± 5.5%, CG (32/70), 45.7 ± 5.9% was observed foci of ischemia, penumbra formation in the remaining patients lasted 8-24 hours at the expense of, the investigation is explained by the presence of penumbra formation over time (Table 2).

MRI and MSKT examinations showed that the localization of the ischemic lesion BG was mostly located in the middle and anterior cerebral arteries CG, mainly in the middle, posterior, and vertebrobasilar circulatory basins.

If we look at the diagram above, in both groups the focus of the stroke was mainly left cerebral AG 45.2 ± 5.56%, NG 43.8 ± 5.93%, and in the basin of the right midbrain arteries AG 23.8 ± 4.76, NG 28, It can be observed that it is located in 1 ± 5.37% of cases. AG-16.6%, NG-6.3% in the anterior cerebral artery basin, AG-11.9% in the spinal artery basin, NG-15.7% and AG 2.4 ± 1.7% in the vertebrobasilar circulatory basin. , NG was found to have an ischemic lesion in 6.3 ± 2.9% of cases Indications were shown for patients with ischemic hearth disease compared to AG (42/80) and NG (32/70). The greater incidence of subartopia, atrophy, and vascular encephalopathy identified in MRI and MSCT in the main group was interpreted as a complication of QD, a directly related disease.

2- table.

Results of dynamic comparison of blood biochemical analysis.

Indicator	AG (n = 80)	NG (n = 70)	p
	M ± m	M ± m	
Urea 1-2 days	8.56 ± 0.45	7.04 ± 0.32	(p> 0.01)
Urea 7-10 days	6.89 ± 0.29	6.18 ± 0.27	(p> 0.05)
Creatinine 1-2 days	117.1 ± 4.15	97.66 ± 3.65	(p> 0.0 5)
Creatinine 7-10 days	101.01 ± 2.87	89.79 ± 2.99	(p> 0.001)
Glucose 1-2 days	10.23 ± 0.39	6.23 ± 0.27	(p> 0.01)
Glucose 3-4 days	8.95 ± 0.32	5.12 ± 0.08	(p> 0.05)
Glucose 5-6 days	8.4 ± 0.29	4.76 ± 0.07	(p> 0.001)

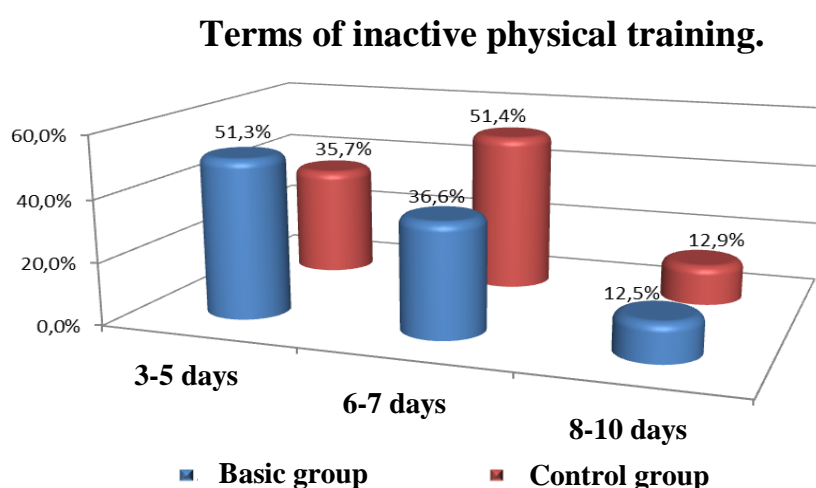
Glucose 7-8 days	7.36 ± 0.19	5, 6 2 ± 0.0 5	(p> 0.05)
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The dynamics of the results of blood biochemical analysis are given in Table 3, the total amount of bilirubin BG n = 15, 17.36 ± 0.34, bound 4.06 ± 0.22, CG n = 12, total bilirubin 17.49 ± 0.61, The bond is 4.15 ± 0.43. ALT BG n = 18, 31.8 ± 2.14n = 13, 30.3 ± 4.9 and AST BG 27.6 ± 1.4, CG 26.5 ± 3.2, and there is a significant difference between these indicators. not detected. The amount of urea in the blood BG was 8.56 ± 0.45 at the initial examination, 6.89 ± 0.29 at the end of the study and 6.89 ± 0.29 after the initial BG, 6.18 ± 0.27, and the amount of keratin before BG was 117.1. ± 4.15, then 101.01 ± 2.87 and CG first 97.66 ± 3.65, then 89.79 ± 2.99 mmol \ 1.

Therapeutic exercise is one of the most important areas of early rehabilitation. In the study groups, inactive therapeutic exercises and breathing gymnastics exercises that could be used in the acute period of ischemic stroke and were not contraindicated for the use of QD were recommended. Initiation of therapeutic exercises was started when the patient's consciousness, blood sugar, PLR and BSP test results were taken into account, and the treatment was started when there were proportional indicators. Delays that occurred in the study groups due to circumstances that prevented the initiation of therapeutic exercises were noted and studied in groups. Therapeutic exercise normalizes neurodynamic processes and accelerates recovery by creating a stream of impulses that tend to the center and escape from the center as a result of slow and active movements.

Therapeutic exercise generalizes the passage of sensory and motor impulses in the affected arms and legs, improves blood circulation, normalizes weakened muscle activity, prevents the formation of joint contractures and restores motor coordination. The use of therapeutic physical exercise prevents the occurrence of inflammatory diseases of the lungs, bed sores and constipation.

Figure 2.



The most common cause of delayed onset of inactive gymnastics was pain syndrome, which was observed in cases of positive BSP test results and blood glucose levels above 13 mmol / l in the main group, and inactive gymnastics was

continued in patients with impaired consciousness. Delays in BG were observed to be higher than CG.

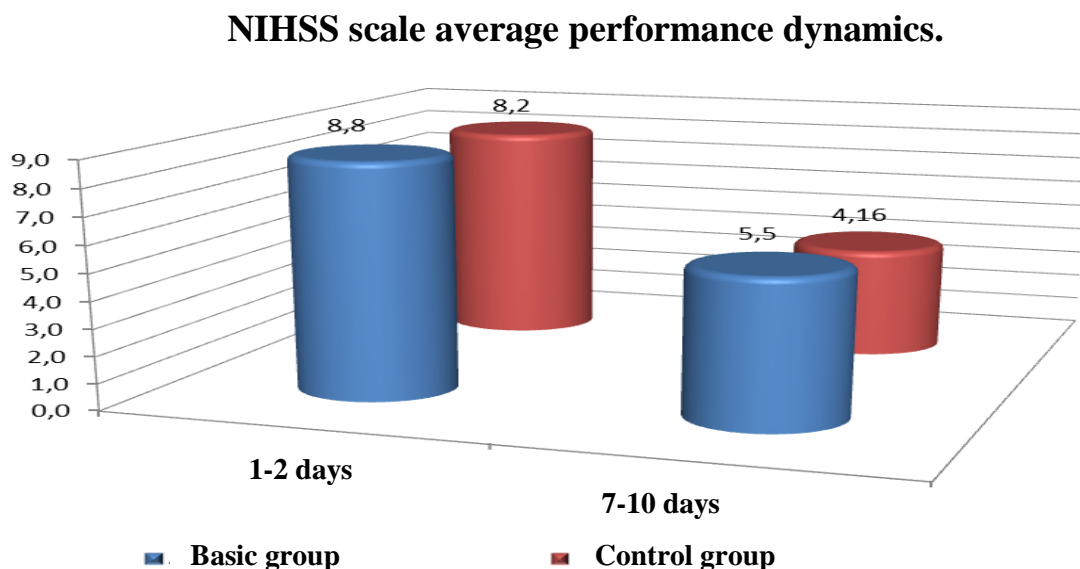
Inactive gymnastic exercises for 3-5 days BG n = 41, $51.3 \pm 5.6\%$, CG n = 25, $35.7 \pm 5.7\%$, 6-7 days BG n = 29, $36.3 \pm 5.4\%$, CG n = 36, $51.4 \pm 6.0\%$, and more than 8 days BG n = 10, $12.5 \pm 3.7\%$, CG n = 9, $12.9 \pm 4.0\%$. Exercise lasted 3-5 days in most cases due to delays in BG, but 6-7 days in most cases in CG (Figure 2).

Respiratory gymnastics exercises were performed in patients with unconsciousness and stable hemodynamic parameters. Respiratory gymnastics exercises, in contrast to passive therapeutic exercises, required the active participation of the patient, causing the process to be delayed for several days.

In addition to therapeutic exercises, patients were monitored for bed rest, verticalization, and attitudes toward the healthy and restricted side of movement in various body positions. On the side where movement restriction was observed, the body condition was regularly monitored to prevent local circulatory disturbances and the formation of bed sores, and the load ratio of the parties was changed if necessary.

Patients on the NIHSS scale were examined in the early days and at the end of hospitalization and compared between groups to assess the conditional dynamics of the patients.

Figure 3.



At the beginning of the study, the mean BG on the NIHSS scale was 8.8 ± 0.36 , at the end of the study it was 5.5 ± 0.29 , and at the end of the study CG was 8.2 ± 0.37 , and after treatment and rehabilitation measures it was 4.16 ± 0.29 . (Figure 3).

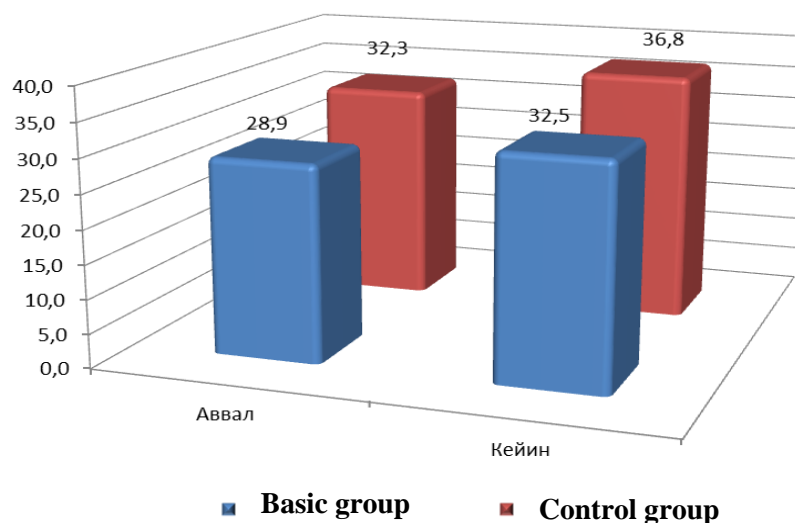
Patients whose objective condition was assessed as satisfactory on the NIHSS scale were not observed in either group at the beginning of the ban. Was observed in 2% of cases. Mild neurological disorders at the beginning of the ban BG (33/80), $41.3 \pm 5.5\%$, at the last examination (58/80), $72.5 \pm 5\%$, before CG (36/70) $51.4 \pm 6\%$, then (47/70) was observed in $67.1 \pm 5.6\%$ of cases. Moderate neurological

insufficiency BG before (39/80) $48.7 \pm 6\%$, after treatment (7/80) $8.8 \pm 3.2\%$, before CG rehabilitation measures (28/70) $40 \pm 5.9\%$, then (5 \ 70), $7.1 \pm 3.1\%$ were observed. Severe neurological deficit BG in the initial examination (8/80), $10 \pm 3.4\%$, in the final examination (2/80), $2.5 \pm 1.7\%$, CG before (6/70), $8.8 \pm 3, 2\%$ of patients with severe neurological impairment after treatment and rehabilitation measures were not identified. Patients with severe neurological deficits were not included in the study because no such patients were recorded in the groups before and after the study.

MRS is a rehabilitation scale used to assess the dynamics of recovery of muscle strength and motor activity. Muscle strength in the proximal and distal parts of each limb was assessed separately.

Figure 4.

MRS scale Dynamics of muscle strength assessment.



1-2 days

7-10 days

Muscle strength was 28.9 ± 0.63 points at the beginning of the study on the MRS scale and 32.3 ± 0.59 points on the CG can be observed to be restored to the score (Fig. 4). Based on the NIHSS and MRS scale indicators, the initial indicators of BG showed deeper signs of neurological deficits, with positive changes in the patient population in both groups after treatment and early rehabilitation measures, and recovery was less than in CG patients.

Conclusions

1. In the course of ischemic stroke and ischemic stroke with diabetes mellitus, inactive physical training exercises and breathing exercises can be used in the joints from the acute stage of the disease.

2. Therapeutic exercise stimulates the passage of sensory and motor impulses in the affected arms and legs, improves blood circulation, normalizes weakened muscle activity, prevents the formation of joint contractures and helps to restore movement coordination.

3. Respiratory tract is a general stimulant and prevents the occurrence of infectious complications in the respiratory system.

4. Therapeutic exercise is one of the important components of complex early rehabilitation measures in the acute period of ischemic stroke and is important in the general activation of the patient's body, the elimination of neurological deficiencies and the prevention of secondary complications.

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