ETHIOPIAN INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

eISSN: 2349-5715 pISSN: 2349-5707

Volume: 10, Issue 11, Nov-2023 SJIF 2019: 4.702 2020: 4.737 2021: 5.071 2022: 4.919 2023: 6.980

REHABILITATION FOR THE RESTORATION OF MOTOR SKILLS AND SENSITIVE FUNCTIONS IN NEUROLOGICAL PATIENTS

Kamoldinova D.B.

Andijan State Medical Institute

Abstract: The relevance of the problem of ischemic stroke (IS) in young people (18-45 years) is primarily determined by the difference between its causes and those in older age groups, the recognition of which requires special laboratory and instrumental studies and is often associated with considerable difficulties. The urgency of the problem is also indicated by the high frequency of cryptogenic stroke (15-40%), stroke of unknown etiology. In addition, the causes of IS have changed in recent years. Thus, the successes in the treatment of rheumatism achieved in the last century have led to the fact that cardiogenic cerebral artery embolisms caused by rheumatic heart valve damage, previously the main cause of IS at a young age, are now uncommon. Finally, socio-economic factors associated with the young age of patients, as well as the tendency to increase IS at a young age, are of no small importance.

In this regard, the issue of developing high-tech rehabilitation equipment remains relevant to restore motor and sensory functions in patients with neurological diseases.

Keywords:ischemic stroke, rehabilitation, cognitive impairment.

The aim of the study: To develop a robotic modular device for restoring motor and sensory functions in neurological patients.

Materials and methods: The proposed device has a modular structure and consists of three modules. The first module has the form of a glove, which is made by vibration motors from the inside over the entire area. The outside of the glove is covered with LEDs, each of which is paired with its own vibration motor. The second module has the form of a bracelet, which is attached to the forearm with textile fasteners. There are four stepper motors on the module: two on the front surface and two on the back surface of the forearm. There are fasteners between the shafts of stepper motors to which wire finger clips are attached to secure them to the fingertips. The operation of stepper motors provides flexion and extension of the hand, which contributes to the restoration of motor functions. The third module it has the form of a bracelet, on the front surface of which a control unit is attached, on the back – a battery. The device has the following operating principle. When the first module is turned on, the vibration motors that are located in the area of the distal phalanges of the fingers are turned on first, and the power of the vibration motors increases gradually, then, having reached the maximum values, the power of the above vibration motors gradually decreases, while the vibration motors are switched on simultaneously with a gradual increase in power in the area of the middle phalanges of the fingers and so on until the vibration motors are turned on, which are located furthest from the distal phalanges of the fingers. Then the specified cycle repeats automatically. This principle of operation provides wave-like activation of vibration motors "from the periphery to the center", which provides consistent stimulation of the sensitive nerve endings of the distal and then proximal parts of the hand, as well as stimulation of the superficial and deep the receptors of the hand promotes reflex contraction of muscle fibers, which contributes to the restoration of motor functions. The use of the second module in rehabilitation provides a mode of passive development of the muscle groups of the hand and forearm with the help of stepper motors, which increases the efficiency of using the device and reduces the recovery time of lost functions. In addition, the device provides the ability to adjust the speed of propagation of the vibration wave, the power of vibration motors and the speed of rotation of stepper motors with the help of a control unit, which makes it

eISSN: 2349-5715 pISSN: 2349-5707

Volume: 10, Issue 11, Nov-2023 SJIF 2019: 4.702 2020: 4.737 2021: 5.071 2022: 4.919 2023: 6.980

possible to configure and use the device by patients depending on the degree of paralysis and sensitivity disorders.

Results:a robotic modular device has been developed to restore motor and sensory functions in neurological patients.

Conclusion: The use of the proposed device in rehabilitation will allow in a shorter time to restore motor and sensory functions in patients with neurological pathology.

Literature:

1. Vakhnina N.V., Parfenov V.A., Nikitina L.Yu. Cognitive disorders in stroke and their treatment with memantine. Clinical gerontology 2005; 11(8): 49-52.

2. Gusev E.I., Kamchatnov P.R. Plasticity of the nervous system.

Journal of Neurology and Psychiatry named after S.S. Korsakov 2004; 3:73-78.

3. Ilyasova F.N., Levin O.S. The effect of hypoglycemic therapy on the dynamics of cognitive impairment in type 2 diabetes mellitus in the early recovery period after ischemic stroke. Zemsky doctor 2015; 3(27): 19-22.

4. Karpova E.N., Muravyev K.A., Muravyeva V.N., Karpov S.M., Shevchenko P.P., Vyshlova I.A., Dolgova I.N., Khatueva A.A. Epidemiology and risk factors for ischemic stroke. Modern Problems of Science and education 2015; 4:441-450.