INNOVATIVE APPROACHES TO REHABILITATION OF PATIENTS WITH SENSORIMOTOR DISORDERS AFTER ISCHEMIC STROKE

Ph.D., Associate Professor Butaboev M.T.,
assistant Kamalova N.L.,
assistant Butakhonov F.T.,
assistant Sodikov S.A.
Department of Rehabilitation, Sports Medicine,
Folk Medicine and Physical Culture. AGMI.

ABSTRACT

Goal. Approaches to rehabilitation of patients with sensorimotor disorders after ischemic stroke. Material and methods. 220 patients who had suffered an ischemic stroke in the middle cerebral artery basin on the right (106) and left (104) were examined. The average age was 58.6±6.5 years, the duration of the disease was 1.2 years. The diagnosis was verified using magnetic resonance imaging of the brain; the size of the post-stroke focus ranged from 1 to 3 cm. The control group consisted of 35 healthy people, comparable in age. All the subjects were right-handed. Results. In patients with lateralized hemispheric ischemic stroke, the formation of heterogeneous clinical and neurophysiological patterns realized by different pathogenetic mechanisms in the central nervous system in the post-stroke period was shown — deactivation and de-inhibitory variants, which suggested the use of differentiated programs for the rehabilitation of these patients. Conclusion. Thus, the use of differentiated, pathogenetically based approaches to the rehabilitation of sensorimotor disorders in patients after ischemic hemispheric stroke improves the quality of the neurorehabilitation process.

***Keywords**: ischemic stroke, neurorehabilitation, disability, kinesitherapy, massage.*

ИННОВАЦИОННЫЕ ПОДХОДЫ К РЕАБИЛИТАЦИИ ПАЦИЕНТОВ С СЕНСОМОТОРНЫМИ НАРУШЕНИЯМИ ПОСЛЕ ИШЕМИЧЕСКОГО ИНСУЛЬТА

к.м.н., доцент Бутабоев М.Т.,
ассистент Камалова Н.Л.,
ассистент Бутахонов Ф.Т.,
ассистент Содиков С.А.
Кафедра реабилитологии, спортивной медицины,
народной медицины и физической культуры. АГМИ.

АННОТАЦИЯ

Цель. Подходы к реабилитации пациентов с сенсомоторными нарушениями после ишемического инсульта. Материал и методы. Были обследованы 220 больных, перенесших ишемический инсульт в бассейне средней мозговой артерии справа (106) и слева (104). Средний возраст составил 58,6±6,5 лет, длительность заболевания — 1,2 года. Диагноз был верифицирован с помощью магнитно-резонансной томографии головного мозга; размер постинсультного очага составил от 1 до 3 см. Контрольную группу составили 35 здоровых человек, сопоставимых по возрасту. Все испытуемые были правшами. Результаты. У больных с латерализованным полушарным ишемическим инсультом было показано формирование гетерогенных клинико-нейрофизиологических паттернов, реализуемых разными патогенетическими механизмами в ЦНС в постинсультном периоде, — дезактивационный и дезингибиторный варианты, что предполагало применение дифференцированных программ для реабилитации этих пациентов. Заключение. Таким образом, применение дифференцированных, патогенетически обоснованных подходов к реабилитации сенсомоторных нарушений у больных после ишемического полушарного инсульта повышает качество проводимого нейрореабилитационного процесса.

Ключевые слова: *ишемический инсульт, нейрореабилитация, инвалидизация, кинезитерапия, массаж.*

INTRODUCTION

According to WHO, stroke (acute cerebrovascular accident) is the second most common cause of death after coronary heart disease. More than 60 thousand cases are registered annually in Uzbekistan. At the same time, disability after stroke is 83.8%, and the percentage of hospital mortality is 17.3%.

Ischemic stroke occurs when the cerebral arteries are squeezed or clogged. It occurs in more than 80% of cases. According to the Stroke Foundation, in most cases stroke leads to disability and only 10-13% of patients return to their former lives. The consequences of a stroke and a person's life depend on how quickly medical care was provided, on the quality of treatment and subsequent rehabilitation.

MATERIAL AND METHODS

220 patients who had suffered an ischemic stroke in the middle cerebral artery basin on the right (106) and left (1 04) were examined. The average age was 58.6±6.5 years, the duration of the disease was -1.2 years. The diagnosis was verified by magnetic resonance imaging of the brain; the size of the post-stroke focus ranged

from 1 to 3 cm. The control group consisted of 35 healthy people, comparable in age. All the subjects were right-handed.

The original ballooned questionnaire was used to assess the severity of motor disorders, modified Nottingham a scale for the analysis of sensory disorders; the Bartel scale and the FIM functional independence scale. Transcranial magnetic stimulation (TMS) at rest and with facilitation of evoked motor responses (EMR) was used to determine the time of central motor conduction (TCMP) and the thresholds of EMR and short-latency somatosensory evoked potentials (SSEP) for the analysis of latent periods (LP) N9, N20, P25 and N22, P37, N45 components and central time conducting (CTC) N9 N20 and CTC N22 P37.

RESULTS

In patients with lateralized hemispheric ischemic stroke showed the formation of heterogeneous clinical neurophysiological patterns implemented by different pathogenetic mechanisms in the central nervous system in the post—stroke period - deactivation and de-inhibitory variants, which suggested the use of differentiated programs for the rehabilitation of these patients. To do this, all the studied patients after ischemic stroke were randomly divided into two groups depending on the complex of the performed neurorehabilitation against the background of receiving standard drug therapy. There were no significant clinical and neurophysiological differences in patients of the selected groups before the course of neurorehabilitation.

Patients of the 1st selected group (117 people) underwent standard a course using physical rehabilitation methods with a predominant effect on damaged limbs (robotic systems of mechanotherapy; ergotherapy; kinesiotherapy; massage, acupuncture and therapeutic gymnastics; classes with special devices to improve fine motor skills and neuromuscular electrical stimulation of the paretic limb with severe motor deficiency).

In the 2nd group of patients (103 people), the choice of methods of physical rehabilitation was carried out taking into account the "deactivation" or "de-inhibitory" pattern of sensorimotor disorders revealed as a result of clinical neurophysiological examination. Thus, the "deactivation" option implied the use of stimulating methods of physical rehabilitation, and the "de-inhibitory" — methods of the opposite effect. In addition, when determining the program of rehabilitation measures, the presence and severity of afferent and efferent violations on both sides of the body. In particular, bilateral activation of afferent flow (neuromuscular electrical stimulation; stabilgraphic complex with functional biofeedback and feedback; stimulating programs of massage, acupuncture and therapeutic gymnastics) was assumed in the subjects after stroke in the presence of bilateral sensory deficit. Comparative clinical

analysis of patients of the selected groups after 3 weeks of rehabilitation treatment showed significantly less pronounced symptoms of paresis and spasticity and improved statolocomotor functions in patients of the 2nd group compared with those of the 1st group. Comparative neurophysiological analysis of the patients of the selected groups demonstrated a significant improvement in the function of conducting along the efferent fast-conducting tracts on the hemiparesis side (significantly lower indicators of TCMP at rest and with the facilitation of EMR at TMS of the upper and lower extremities) in patients after a differentiated rehabilitation therapy program. Also, group 2 patients had significantly less impairment of daily activity (on the Bartel scale 68.5±4.3 points compared with 57.3±5.2 points in group 1) and functional independence (on the FIM scale 81.1 ±4.1 points compared to 58.8 ± 6.3 points in group 1) after a course of individually selected rehabilitation treatment.

CONCLUSION

Thus, the use of differentiated, pathogenetically based approaches to the rehabilitation of sensorimotor disorders in patients after ischemic hemispheric stroke improves the quality of the neurorehabilitation process. This is reflected in a significant reduction in post-stroke deficit, improvement of daily activity and functional independence of patients. The obtained results suggest the use of innovative approaches to neurorehabilitation of patients after ischemic stroke, taking into account the identified mainly deactivation or de-inhibitory patterns of neuroplastic changes in CNS lesions. When determining individual algorithms of rehabilitation measures in patients with CNS damage, it is necessary to take into account the degree and severity of sensory support disorders. Additional effects on the afferent link in right—hemisphere and spinal lesions of the central nervous system and on efferent support - in the left-hemisphere pathological process helps to increase the functional plasticity of the entire system of voluntary motor activity, contributes to the efficiency of the neurorehabilitation process.

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