



СОСТОЯНИЕ ЗДОРОВЬЯ: МЕДИЦИНСКИЕ, СОЦИАЛЬНЫЕ И ПСИХОЛОГИЧЕСКИЕ АСПЕКТЫ

**XIII Международная научно-практическая
интернет-конференция**



**Чита
2022**

Министерство науки и высшего образования
Российской Федерации
Забайкальский государственный университет
Медицинский университет Семей (г. Семей, Казахстан)

**СОСТОЯНИЕ ЗДОРОВЬЯ:
МЕДИЦИНСКИЕ, СОЦИАЛЬНЫЕ
И ПСИХОЛОГИЧЕСКИЕ
АСПЕКТЫ**

Материалы XIII Международной научно-практической
интернет-конференции

*23–25 ноября 2022 года
Чита – Семей*

Чита
ЗабГУ
2022

УДК 61(082)

ББК 5я54

С 668

Рекомендовано к изданию организационным комитетом
научно-практического мероприятия
Забайкальского государственного университета

Рецензенты

А. В. Дубовая, д-р мед. наук, профессор,
зав. каф. педиатрии № 3, директор Аккредитационно-
симуляционного центра, Донецкий национальный
медицинский университет им. М. Горького, г. Донецк, Россия
С. М. Ли, канд. филос. наук, директор, Центр психолого-
педагогической, медицинской и социальной помощи «ДАР»
Забайкальского края, г. Чита, Россия

Состояние здоровья: медицинские, социальные и психологические аспекты : материалы XIII Международной научно-практической интернет-конференции / Забайкальский государственный университет ; ответственный редактор С. Т. Кохан. – Чита : ЗабГУ, 2022. – 200 с.

ISBN 978-5-9293-3133-6

Материалы, представленные в сборнике научных работ, освещают различные взгляды и приоритетные направления, актуальные для состояния здоровья. Авторы из евразийских стран представили теоретические и практические особенности подходов к сохранению и укреплению здоровья, а также разнообразные аспекты в области медицинской, социальной и психолого-педагогической реабилитации.

Издание предназначено для учёных, педагогов, аспирантов, докторантов, студенческой молодёжи и аудитории, интересующейся здоровьем.

УДК 61(082)

ББК 5я54

ISBN 978-5-9293-3133-6 © Забайкальский государственный университет, 2022

Rehabilitation of Motor Impairments Following a Traumatic Head Injury

***Ivana Sretenovic¹, Srecko Potic²,
Goran Nedovic³, Scepán Sinanovic⁴, Marina Vidojevic⁵***

^{1,3}*Faculty of Special Education and Rehabilitation, University of Belgrade, Belgrade, Serbia,*

^{2,4}*Medical College of Professional Studies „Milutin“, Belgrade, Serbia*

⁵*Children and Youth Institution „Sremčica“, Belgrade, Serbia*

✉ ivanasretenovic@fasper.bg.ac.rs

Traumatic head injury belongs to the group of neurological conditions, following the occurrence of which we may detect difficulties in motor behaviour and cognitive functioning of the persons. The impact of a traumatic head injury on majority of patients is substantial. Rehabilitation of motor impairments encompasses a series of interventions performed on persons after a traumatic head injury and is of crucial significance for such persons to return to their customary activities of everyday life. This study gives a brief display of the rehabilitation approach and its importance to recovery of motor functioning in persons who suffered a traumatic head injury. It is considered that motor impairment rehabilitation programme following a traumatic head injury should focus on specific approaches, leading to improvement of certain motoric tasks and outcome measures.

Keywords: head injury, rehabilitation, neuroplasticity, physical activity

Реабилитация двигательных нарушений после черепно-мозговой травмы

***Ивана Сретенович¹, Сречко Потич², Горан Недович³,
Счепан Синанович⁴, Марина Видоевич⁵***

^{1,3}*Факультет специального образования и реабилитации, Белградский университет, г. Белград, Сербия,*

^{2,4}*Высшая медицинская школа профессионального образования «Милутин Миланкович», г. Белград, Сербия,*

⁵*Учреждение для детей и молодежи «Сремчица», г. Белград, Сербия*

✉ ivanasretenovic@fasper.bg.ac.rs

Черепно-мозговая травма относится к группе неврологических состояний, при возникновении которых могут определяться проблемы двигательного поведения и когнитивной деятельности. Влияние черепно-мозговой травмы на большинство пациентов велико. Реабилитация

двигательных нарушений включает в себя ряд вмешательств, которые предоставляются людям после черепно-мозговой травмы и необходимы для того, чтобы люди могли вернуться к нормальной повседневной деятельности. В статье дано краткое описание реабилитационного подхода и его значения для восстановления двигательных функций у лиц, перенесших черепно-мозговую травму. Считается, что основное внимание в программах реабилитации при двигательных нарушениях после черепно-мозговой травмы должно быть сосредоточено на конкретных подходах, которые приводят к улучшению определенных двигательных задач и показателей результатов.

Ключевые слова: черепно-мозговая травма, реабилитация, нейропластичность, физическая активность

Introduction

It is estimated that the world is inhabited by about 1 billion of people suffering a neurological condition or disease, from stroke and traumatic head injuries, to neurodegenerative diseases [1]. Following occurrence of a neurological condition or disease, these persons frequently experience difficulties in motor behaviour and cognitive functioning. For example, movement issues are frequent that may greatly affect activities of everyday life and lead to a low level in quality of life [2].

Scientific literature data indicate that traumatic head injury (THI) is a challenging condition, both in treatment and in research. The THI encompasses structural injuries or physiological changes in brain function occurring through action of exterior forces [3]. The prevalence of THI in adults over the age of 18 is 8,5 % [3], whereas in children, although insufficiently researched, it represents a substantial issue, having reached annual incidence of 100,000–200,000, with children between the ages of 0 and 4 display the highest incidence and mortality percentages [4]. Although brain injuries represent a significant part of the trauma, the seriousness of THI varies from mild, defined as momentary shift of consciousness, to serious, including long periods of unconsciousness and/or amnesia. Fortunately, over 85 % of the medically treated THI is considered as mild, and majority of patients can recover from the injuries [5]. The impact of head injury on all the segments of life is extremely powerful, especially when observing the economic impact, evident in temporary or permanent absence from work, quality of life, rehabilitation and other medical expenses [3].

Rehabilitation of motor impairments

Rehabilitation of motor impairments encompasses a series of interventions performed on persons following their suffered head injuries, that is, traumatic head injuries, and is of crucial significance for the persons to return to customary activities of everyday life.

The central nervous system has a certain capacity to recover and adapt to compensating mechanisms after injuries. The basis for recovery comes from neuroplasticity, defined as ability of the neural networks to develop adaptive changes, both in structural and functional levels, ranging from molecular, synaptic and cellular changes, to more global network changes. It is traditionally considered that an adult brain stagnates, and that neuronal plasticity is confined to cortex development. However, nowadays, neuronal plasticity occurs following an injury in a three-stage series [6]. Immediately following an injury, cell death occurs, along with reduction in cortical inhibitory pathways during 1 to 2 days, which is considered to be a recruiting or unmasking of new and secondary neural networks, [7], so that, in the end, the activity of cortical pathways shifts from the inhibitory to the excitatory control, followed by proliferation of neurons and synaptogenesis. Both neuronal and non-neuronal cells (i. e. endothelial progenitors, glial cells and inflammatory cells) are recruited in order to replace the damaged cells, relieve the gliotic scarred tissue and ultimately revascularize it [6]. Certain preliminary research suggest that, following the THI, the hippocampus develops long-lasting morphological changes, including the growth of cell somas and neuron recruiting into the hippocampus. In terms of determining the factors that lead to easier recovery after an THI, several studies support the theory that younger age is one of the protective factors. Thus, Berger and associates established that children display better functional recovery than adults do [8], and that injured patients of younger age (below the age of 26) were less disabled compared to older patients (over the age of 40), despite serious injuries [9]. On the other hand, other studies report that children below the age of 4 display poorer motor and cognitive outcome in comparison to older children suffering from THI. The process of recovery following a traumatic head injury is lengthy, but, with new evidence of neuroplasticity, the prospects for recovery are no longer bleak.

With sudden neurologic conditions, such as THI, the post-acute rehabilitation programmes dealing with motor difficulties are provided in hospitals and/or other clinical environments in first months fol-

lowing the diagnosis [3; 4]. Although such programmes are generally useful, most persons suffering from THI experience functional movement defects even on completion of rehabilitation procedures [3; 5]. On the other hand, we have an example of a considerable number of persons suffering from neurodegenerative conditions, such as multiple sclerosis and Parkinson's disease, being denied admittance into hospital or ambulance rehabilitation programmes until they've reached a late stage of disease, thus developing progressive loss in motor function over the period of minimum rehabilitation support [6; 7]. Persistent and progressive losses in motor function lead persons suffering from neurological conditions into a state of deteriorated medical state. Motor defects limit performance of everyday activities [10] and participation in physical activities [11]. Available correlation studies suggest that inactivity aggravates functional defects [12]. In this respect, neurological rehabilitation should not be observed as a temporary undertaking, but as a lifelong endeavour. Unfortunately, persons suffering from complex, chronic medical conditions experience numerous obstacles against participating in rehabilitation (e. g. availability of therapists, financial limitations, and similar) [13].

Majority of the motor function recovery, following a sudden neurological impairment, occurs during rehabilitation within first 3 to 6 months after the injury [3]. Although these initial months constitute a critical period to begin the process of spontaneous healing [14], research findings indicate that further improvements may be achieved in later stages of recovery, extending over years following occurrence of a certain condition [3; 5]. In chronic stages of neurological conditions, advantages of motor rehabilitation may be attributed to physical fitness and neuroplasticity that depend on experience, or to restoring of neural connections as response to experience [15]. Improvements in physical fitness are stimulated by cardiorespiratory training and resistance training, whereas the neuroplasticity, which depends on experience, is affected by exercises implying repetitive motoric, task-oriented exercises [15]. The benefits of physical fitness and neuroplasticity for persons suffering from neurological conditions in terms of motor rehabilitation are proven. More precisely, therapeutic concepts, such as task-oriented-training, progressive practice of increasing movement speed and precision, compensatory adaptations, strengthening and cardiovascular fitness, are embedded among the goals of rehabilitation for persons suffering from majority of neurological

diseases [10]. However, we can make a certain distinction between classic rehabilitation and rehabilitation assisted by physical exercise and neuroplasticity. Classic rehabilitation is enforced for the purpose of improving the function or reducing invalidity that is connected to a certain basic condition or impairment, whereas programmed exercises or physical activities focus on more general medical [1]. We should, however, remark that presence of lasting bodily (physical) invalidity inherent in neurological conditions “blurs the boundaries“ between the indicated types of rehabilitation. For example, if a person suffering from hemiparesis that participates in a programme of general resistance training strengthens their limbs of the affected side and improve function of hands, the programme of general resistance training is assumed to have had a rehabilitative effect. The capacity to engage in rehabilitation activities designed to resolve specific functional deficit (for example, muscle weakness) may be limited by lower level of physical strength [2] or fatigue [12] that can be resolved through general programming of exercises. Another crucial intersection of terms may be explained by the impact of exercising on neuroplasticity that is linked to effects of motor rehabilitation [15]. When persons suffering from neurological conditions exercise, i. e., when they engage in physical activity, it can be considered as a component of motor rehabilitation if the programmed physical activity affects impairment, activity limitations, or participation restrictions.

Instead of conclusion

The fundamental strategy in rehabilitation of motor impairments is to bring the patients to the position of ability to exercise and continuously improve their motor control and motor skills. Regardless of seriousness of a neurological condition or disease, the rehabilitation relies on the adapting ability within and between neurons and their synapses, as response to experience, training and learning. The best proof in our hands is that any form of therapy, applied in a sufficiently high dose, is more likely to reduce the impairment and invalidity than no rehabilitative intervention. The true focus of the motor impairment rehabilitation programme following a traumatic head injury ought to be placed on specific approaches to improving certain motoric tasks and outcome measures.

References

1. The Neurological Alliance. Neuro numbers. URL: <https://www.neural.org.uk/wp-content/uploads/2019/07/neuro-numbers-2019.pdf> (дата обращения: 03.10.2022). Текст: электронный.
2. Ransmayr G. Challenges of caregiving to neurological patients. Herausforderungen in der Betreuung und Pflege neurologischer Patientinnen und Patienten. Текст: электронный // Wiener medizinische Wochenschrift (1946). 2021. № 171(11–12). P. 282–288. URL: <https://doi.org/10.1007/s10354-021-00844-8> (дата обращения: 03.10.2022).
3. Traumatic Brain Injury in the United States: Fact Sheet. URL: http://www.cdc.gov/traumaticbraininjury/get_the_facts.html (дата обращения: 03.10.2022). Текст: электронный.
4. Casella E. M., Thomas Th. C., Vanino D. L., Fellows-Mayle W., Lifshitz J., Card J. P., Adelson P. D. Traumatic brain injury alters long-term hippocampal neuronal morphology in juvenile, but not immature, rats // Official Journal of the International Society for Pediatric Neurosurgery. Childs Nerv Syst. 2014. № 30(8). P. 1333–1342.
5. Orman J. A. L. Epidemiology: Textbook of Traumatic Brain Injury: Ed. J. M. Silver, T. W. McAllister, S. C. Yudofsky. Virginia: American Psychiatric Publishing, 2011. P. 1–22.
6. Burda J. E., Sofroniew M. V. Reactive gliosis and the multicellular response to CNS damage and disease // Neuron. 2014. № 81(2). P. 229–248.
7. Nahmani M., Turrigiano G. G. Adult cortical plasticity following injury: Recapitulation of critical period mechanisms? // Neurosci. 2014. № 283. P. 4–16.
8. Berger M. S., Berger M. S., Pitts L. H., Lovely M., Edwards M. S., Bartkowski H. M. Outcomes from severe head injury in children and adolescents // Neurosurg. 1985. № 62(2). P. 194–199.
9. Marquez de la Plata C. D. et al. Impact of age on long-term recovery from traumatic brain injury // Arch Phys Med Rehabil. 2008. № 89(5). P. 896–903.
10. Dobkin B. H. Training and exercise to drive poststroke recovery // Nat Clin Pract Neurol. 2008. № 4. P. 76–85.
11. Mulligan H. F., Hale L. A., Whitehead L., Baxter G. D. Barriers to physical activity for people with long-term neurological conditions: a review study // APAQ. 2012. № 29(3). P. 243–265.
12. Cott C. A. Client-centred rehabilitation: client perspectives // Disabil Rehabil. 2004. № 26(24). P. 1411–1422.
13. Tseng S. H., Chang F. H. Transitioning from hospitals to the community: perspectives of rehabilitation patients with neurological disorders and their service providers // Disabil Rehabil. 2017. № 39(23). P. 2420–2427.
14. Cassidy J. M., Cramer S. C. Spontaneous and therapeutic-induced mechanisms of functional recovery after stroke // Transl Stroke Res. 2017. № 8(1). P. 33–46.

15. Nielsen J. B., Willerslev-Olsen M., Christiansen L., Lundbye-Jensen J., Lorentzen J. Science-based neurorehabilitation: recommendations for neurorehabilitation from basic science // Mot Behav. 2015. № 47(1). P. 7–17.

УДК: 616.248-053.2-08

**Оценка эффективности реабилитации детей
с бронхиальной астмой в условиях
стационарозамещающих технологий**

Елена Викторовна Стежкина¹, Нелли Эдуардовна Туккаева²

*^{1,2}Рязанский государственный медицинский университет
имени академика И. П. Павлова Минздрава России, г. Рязань, Россия
¹polus1972@yandex.ru, ²Nessiktukk@yandex.ru*

Аннотация. Учитывая тенденцию к росту числа случаев хронической респираторной патологии среди педиатрической популяции в ретроспективном исследовании проведена оценка эффективности реабилитации в условиях стационарозамещающих технологий (дневной стационар поликлиники), направленных на снижение частоты обострений и увеличение степени контроля детей с бронхиальной астмой (БА) с разработкой анкет по оценке качества работы дневного стационара (ДС). В ходе исследования показано, что комплекс реабилитационных мероприятий БА на фоне базисной терапии оказывает положительное влияние как на клинические показатели, так и на общее состояние детей, что играет большую роль в формировании комплаентности пациентов к лечению и способствует полноценному контролю над заболеванием.

Ключевые слова: дети, бронхиальная астма, реабилитация, дневной стационар

**Evaluation of the Effectiveness of Rehabilitation in Children
with Bronchial Asthma in Conditions
of the Hospital-Replacing Technologies**

Elena Viktorovna Stezhkina¹, Nelli Eduardovna Tukkaeva²

*^{1,2}Ryazan State Medical University of the Ministry of Health of the Russian
Federation, Ryazan, Russia
¹polus1972@yandex.ru, ²Nessiktukk@yandex.ru*

Annotation. Taking into account the trend towards an increase in the number of cases of chronic respiratory pathology among the pediatric population, a retrospective study assessed the effectiveness of rehabilitation in hos-

Научное издание

**СОСТОЯНИЕ ЗДОРОВЬЯ: МЕДИЦИНСКИЕ,
СОЦИАЛЬНЫЕ И ПСИХОЛОГИЧЕСКИЕ АСПЕКТЫ**

*Сборник издается в соответствии с оригиналом,
подготовленным редакционной коллегией,
при участии издательства*

Вёрстка Г. А. Зенковой

Подписано в печать: 26.12.2022.

Формат бумаги 60×84/16. Бумага ксерографическая.

Печать цифровая. Гарнитура Times New Roman.

Усл. печ. л. 11,6. Уч.-изд. л. 9,7.

Печать по требованию. Заказ № 22175.

ФГБОУ ВО «Забайкальский государственный университет»
672039, г. Чита. ул. Александро-Заводская, 30