

CORRECTION OF COGNITIVE IMPAIRMENT IN CEREBRAL PALSY WITH PSYCHOMOTOR REHABILITATION

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Abstract: This article highlights the topic of an integrated approach to the correction of cognitive impairment in patients with cerebral palsy (CP) using unique methods of psychomotor rehabilitation, such as hippotherapy and therapeutic swimming. The authors consider the effectiveness of these methods in the context of improving cognitive functions, increasing the overall level of activity and socialization of children with cerebral palsy. Hippotherapy, also known as therapeutic equine riding, is used to stimulate neuromotor development, improve balance, coordination and sensory integration. The article highlights how the rhythmic movements of a horse promote the activation of various muscle groups and brain centers responsible for cognitive processes. Therapeutic swimming, in turn, is another important method that provides a complex effect on the body. Swimming promotes fine motor skills, improves motor coordination, and promotes cognitive development through play and visual-motor integration. The authors analyze the results of studies and clinical observations, demonstrating how regular use of hippotherapy and therapeutic swimming can have a positive effect on cognitive development, increase adaptive abilities and the quality of life of children with cerebral palsy. Particular attention is paid to the psychological aspect of rehabilitation, including strengthening self-esteem and social adaptation.

Keywords: cerebral palsy (cp), cognitive impairment, psychomotor rehabilitation, hippotherapy, therapeutic swimming, neuromotor development, play therapy in rehabilitation

Introduction:

Cerebral palsy (CP) is a disease based on a hereditarily determined process of underdevelopment of areas of the brain matter and untimely inclusion in the physiological development of certain areas of the child's brain, occurring before and continuing after birth [1-3].

Double hemiplegia is the most severe form of cerebral palsy. Characteristic features are spastic tetraplegia or tetraparesis with predominant localization in the arms and uneven damage to the sides, severe mental and speech disorders. Due to the high muscle tone in the limbs, the arms are bent at the elbow joints, brought to the body, the legs are bent at the hip and knee joints. Severe movement disorders are combined with early joint contractures and bone deformities. Tendon

reflexes are very high. Pathological hand and foot reflexes are detected. Thinking is slow, inert, memory is weakened [4-5].

Currently, the study of cerebral palsy in the field of restorative medicine is associated with rehabilitation. In this regard, the development of methods of prevention and medical rehabilitation based on correcting the functional state and increasing the reserve and adaptive capabilities of the body is one of the urgent tasks that determine the priority direction of scientific research in the field of restorative medicine. Damage to the motor sphere in double hemiplegia can be expressed to varying degrees: motor disorders can be so severe that they completely deprive children of the opportunity to move freely. A weak sense of one's movements and difficulty in acting with objects are the causes of insufficiency of active touch and recognition by touch [2]. This, in turn, further complicates the development of purposeful practical actions and affects the psychomotor development of children [6-7].

The use of traditional and non-traditional methods of treatment, in particular therapeutic physical education, makes a significant correction in disorders of motor and other areas of damage. Of particular relevance is the use of new means of correction in children with cerebral palsy.

In this regard, the use of new methods of restorative effects on the body of a child with cerebral palsy is a relevant and timely problem. Currently, such means as hippotherapy and therapeutic swimming are used for this purpose. The uniqueness of hippotherapy is explained by the fact that due to the influence of a rhythmically ordered motor and sensory load on the rehabilitator during his close contact with the horse, a consistently pronounced effect is achieved. Hippotherapy makes it possible to have a positive effect not only on the physical, but also on the mental state of the body of a child with cerebral palsy [4]. This circumstance served as the purpose of the work.

The purpose of this work was to determine the effectiveness of therapeutic swimming and hippotherapy on the development of psychomotor activity in children 10-12 years old with cerebral palsy, in the form of double hemiplegia.

MATERIALS AND METHODS OF RESEARCH

The study involved 28 children aged 10-12 years of both sexes with a diagnosis of cerebral palsy in the form of double hemiplegia. The subjects were divided into 2 groups (Table 1). In each group, children with cerebral palsy were examined twice: the first time - before the course of rehabilitation measures (initial examination), the second time - after the course (final examination). The duration of the course of therapeutic swimming and hippotherapy was 45 procedures. For children from group No. 1, classes included therapeutic swimming, and from group No. 2 - hippotherapy .

To achieve the goal, psychomotor abilities were tested and the results were processed using the Longitude computer program . The levels of development of the following abilities were determined: general motor activity (child's motor skills), fine motor coordination, perception and thinking.

Table 1

Distribution of children into groups depending on diagnosis and procedures performed

Group	Procedures performed	Average age, years
No. 1	Therapeutic swimming	10.5 ± 1.7
No. 2	Hippotherapy	11.1 ± 1.2

table 2

Study of indicators in children diagnosed with cerebral palsy in the form of double hemiplegia

Parameters studied	Groups of subjects	Indicators, in conventional terms . units		R
		the initial state	after rehabilitation measures	
	No. 1	-0.79 ± 0.04	-0.68 ± 0.05	<0.05

General motor activity	No. 2	-0.77 ± 0.05	-0.62 ± 0.04	<0.05
	No. 1	-0.81 ± 0.04	-0.71 ± 0.03	<0.05
Fine motor coordination	No. 2	-0.83 ± 0.05	-0.69 ± 0.06	<0.05
	No. 1	-0.82 ± 0.03	-0.71 ± 0.04	<0.05
Perception	No. 2	-0.81 ± 0.04	-0.65 ± 0.05	<0.05
	No. 1	-0.78 ± 0.04	-0.67 ± 0.05	<0.05
Thinking	No. 2	-0.84 ± 0.03	-0.69 ± 0.04	<0.05
	No. 1	-0.82 ± 0.03	-0.71 ± 0.04	<0.05

The analysis of the studies was carried out with the determination of the main statistical parameters ($M \pm m$) and the reliability of their differences according to the nonparametric Wilcoxon test, based on the standard computer program MS Excel and showed the high reliability of the results obtained.

RESULTS AND DISCUSSION

Regardless of the parameters being determined, in the Longitude program their normative values are as follows: below -0.65 - a large lag from normal development; from -0.65 to -0.30 inclusive - a slight lag; from -0.30 to +0.41 inclusive - normal development; above 0.41 - advance of normal development.

As a result of the use of therapeutic swimming, all children with cerebral palsy of group No. 1 improved their overall motor development by an average of 16.7%. In group No. 2 in children, a study of the average indicator of general motor development before and after rehabilitation measures showed an improvement in the studied parameter by 24.2%.

In group No. 1, the average value of the development parameter of fine motor coordination improved by 14.1%. This indicates that therapeutic swimming effectively improved the average level of fine motor coordination of children with cerebral palsy. A study of the parameter value of the level of fine motor coordination, calculated during the initial and final examinations of children with cerebral palsy in group No. 2, revealed an improvement in this indicator by 20.3%. This indicates that the use of hippotherapy significantly improved the average level of fine motor coordination in children.

As follows from the table. 2, as a result of the use of hippotherapy, the perception indicators of the examined children with double hemiplegia improved by an average of 24.6%, and in group No. 1 this indicator changed by only 15.5%.

A study of the parameters of the level of thinking showed that a course of hippotherapy significantly increased the level of thinking in children with cerebral palsy by 21.8%. After a course of procedures using therapeutic swimming in the group of examined children with double hemiplegia, thinking indicators improved by only 16.5%.

The study showed that hippotherapy can significantly increase the effectiveness of rehabilitation for cerebral palsy. They are superior to therapeutic swimming in their effectiveness in developing fine motor coordination, perception and thinking. Consequently, hippotherapy is a highly effective means of improving the development of identified parameters in children with cerebral palsy.

CONCLUSIONS

All of the above indicates the high effectiveness of hippotherapy in the development of psychomotor activity in children aged 10-12 years with double hemiplegia. Hippotherapy affects the body of children with cerebral palsy through two powerful factors: psychogenic and biomechanical. Analyzing the data obtained, we can conclude that, in contrast to therapeutic swimming, hippotherapy has a stronger activating effect not only on subcortical structures at the

level of the reticular formation and thalamus, but also on the structures of the prefrontal frontal cortex, which provides verbal-logical thinking, which leads to an improvement in the level of perception and thinking in children with cerebral palsy in the form of spastic double hemiplegia.

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