

## USING THE METHOD KINESIOTAPING IN REHABILITATION OF CHILDREN WITH HEMIPARETIC FORM OF CEREBRAL PALSY

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*The study examines the impact of a new kind of impact in the rehabilitation of hemiparetic form of cerebral palsy – a method kinesiotaping “Concept 4 tapes.” Within this framework, the receptor patient unit gradually turned on, resulting in a restructuring of the program abnormal movement, the conditions of use of other methods to increase the efficiency and depth of the order of their influence.*

*The advantage of a technique kinesiotaping is the standard approach, allowing you to apply effects diagram method to all patients without loss of efficacy of therapeutic effects.*

**Keywords:** *Hemiparetic form of cerebral palsy; rehabilitation; method kinesiotaping; receptor apparatus; central nervous system.*

### Relevance

Infantile cerebral paralysis refers to the serious consequences of perinatal affection of the central nervous system and is one of the main causes of disability of children [3, 4]. The most common are spastic forms of the disease, which accounts for up to 80–85% [2, 3].

Numerous studies are devoted to the restoration of functional disorders, orthopedic alignment of children with ICP [2, 3]. However, among the publications devoted to the complex rehabilitation of children with ICP, there are no works on complex use of rehabilitation methods, where kinesiotaping could be the leading one.

Despite the fact that kinesiotaping method itself exists about 30 years, the principles and approaches of its use in rehabilitation of ICP are almost completely absent.

In the present study we use a new therapeutic approaches to the treatment of ICP using kinesiotaping, which were developed at the

Department of Rehabilitation and Sports Medicine of RSMU named after N.I. Pirogov by D.A. Kiselev [6, 7, 9].

Considering the great practical experience and the creation of entirely new approaches of taping [6, 7, 9], we can assert that the new technique is created, which should be viewed in a number of basic approaches to the rehabilitation of the problem under consideration. Extensive accumulated experience of the effective application of this method, in the absence of any rehabilitation in parallel, allows speaking about it as a very highly effective.

The method is applied with constant analysis of data on the basis of Department of Rehabilitation and Sports Medicine of RSMU named after N.I. Pirogov in the conditions of medical rehabilitation department of Russian children's clinical hospital (RCCH) and on the basis of Pathology and Hematology Clinic of Saratov State Medical University (SSMU).

### **Goal of research**

Improving the efficiency of remediation activities for children with hemiparetic form of ICP through the use of kinesiotaping.

### **Outline of the method**

Working with children with disorders of locomotor, we came to the conclusion that it is not enough just to stimulate the muscles that are in a state of hypotension. In addition, the response to this exposure will depend on the body analysis of muscles that are in great tonicity.

In the absence of full amplitude of movements, normal innervation and muscular system supply the body is unable to use both muscles in a state of hypotension and those which are characterized by hypertension of the central genesis. At the same time the central nervous system has to obtain information about the state of the muscles and their activities. Proprioceptive apparatus of whole tendinous-muscle system does not provide such information.

The way out of the current situation is the use of tapes, different in their elastic properties (6) for gradual, targeted introduction of the receptor apparatus of the patient, leading to rearrangement of patholog-

ical motion program, which is present at disturbances of locomotor, and under conditions of use of other methods increases the depth and efficiency of their influence.

### **Research approach**

- 1) The study and analysis of literary sources
- 2) medical and biological methods;
- 3) pedagogical supervision;
- 4) pedagogical experiment;
- 5) methods of mathematical statistics.

### **Organization of the research**

The study involved 50 children of both sexes in the age range of 1 to 3 years with various forms of ICP, who took remedial treatment at the Russian Children's Clinical Hospital, the Health House "Vorontsovsky".

The control group included 24 children with ICP, hemiparetic form, who not received the methodology of kinesiotaping.

The experimental group consisted of 26 children with ICP, hemiparetic form who received rehabilitation treatment and methodology of kinesiotaping. Taping was conducted 1 time with an interval of 4 days. Taping was conducted during whole rehabilitation, an interval of 6 months is taken.

Taping was conducted 1 time with an interval of 4 days. Assessment of the results in this paper was limited to 4–5 taping session, during which we used tapes of the type IV.

#### **The first session was conducted with the use of tapes of the type I.**

Tapes were applied to the most indurated areas of flexor and extensor. The degree of tension – 0%.

#### **Second session was conducted with the use of tapes of the type II.**

Tape was applied to the following areas:

- 1) front group of leg muscles (mm.tibialis anterior, extensor hallucis longus, extensor digitorum longus).
- 2) combinational taping of dorsal group of forearm muscles with an emphasis on long and short extensor of the thumb (mm.abductor pollicis brevis et longus), as well as second finger of the hand.

- 3) taping from the middle of triceps brachii muscle (m. triceps brachii).
- 4) stimulus taping of the dorsal group of pelvic girdle muscles (mm. gluteus maximus, medius, minimus).
- 5) Taping with the tape of the type I on the most indurated areas of the dorsal group of antinemon and huckle muscles (mm. triceps surae, biceps femoris, semitendinosus).

The degree of tension 10–15%.

**Third session was conducted with the use of tapes of the type III with the degree of tension 20–40%.** Tape was applied to the same areas as in the previous session.

**Fourth session was conducted with the use of tapes of the type IV** with variations of technical and practical implementation. Degree of tension of the tape 40–50%. Tape was applied to the same areas as in the previous session.

In parallel with these applications at every session was performed taping to incorporate centering function.

### Results of the research

Prior to the experiment, the children in both groups were engaged in Vojta therapy and vibrotherapy within 1 month. Indicators of stabilometric data of the control and experimental groups were not significantly different.

During the experiment we have comparative data of stabilometric indicators of the control and experimental groups before and after the experiment. ( $M \pm \sigma$ )

Table 1.

	Control group		Experimental group	
	Before experiment	After experiment	Before experiment	After experiment
The average position of the total center of pressure in the frontal plane X (mm)	10,3±1,5	3,5±3,8 *	10,9±1,3	0,5±2,1 *
The average position of the total center of pressure in sagittal plane Y (mm)	31,8±1,9	27,4±1,3	68,2±1,2	60,5±1,3

*The End of a Table 1.*

The standard deviation of the total center of pressure in the frontal plane Max X (mm)	10,2±1,7	8,91±1,1*	10,7±1,2	5,7±3,18*
The standard deviation of the total center of pressure in sagittal plane Max Y (mm)	42±1,8	46,5±1,3	11,4±3,2	19,6±1,7
Speed of the total center of pressure V (mm/s)	9,66±1,3	9,54±0,8	9,51±0,8	6,18±0,5
Force plate image area S (mm <sup>2</sup> )	94,4±1,9	86,8±1,3 *	161±1,4	98,1±3.8 *
Stability index Si (%)	41,4±1,6	43,5±1,1	42±1,7	48,9±0,7
Energy index Ei (J/°)	5,3±1,7	4,8±2,4	3,59±1,5	1,76±2,3

Note: \* The differences are significant at the level of  $p < 0,05$

### Results of research

1) children with hemiparetic form of ICP according to the data of stabilometry were revealed the following disturbances of motor functions:

- The average position of the center of pressure along axis X (~ X c) – 10,3±1,5 mm;
- the maximum amplitude of oscillation of the center of pressure along axis X (Max X) – 10,2±1,7 mm;
- the average value of the area of the force plate image – 94,4±1,9 mm<sup>2</sup>.

2) the use of Vojta therapy and vibrotherapy contribute to the improvement:

- of the average position of the center of pressure along axis X (~ X c) on 6,8 mm,
- of the maximum amplitude of oscillation of the center of pressure along axis X (Max X) on 1, 29 mm,
- of the average value of the area of force plate image on 7,6 mm<sup>2</sup>

3) methodology of kinesiotope contributes to:

- improvement of average position of the center of pressure along axis X (~ X c) on 10,4 mm,

- of the maximum amplitude of oscillation of the center of pressure along axis X (Max X) on 5 mm,
- of the average value of the area of the force plate image on 62,9 mm

The investigations allow us to assume that methodology of kinesiotopeping in combination with other rehabilitation measures is effective for the correction of motor disorders of children with hemiparetic form of ICP.

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