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Kinesiotaping: New Look at the Rehabilitation of Facial Nerve Neuropathy in Children

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Summary: The article provides an overview of the special scientific literature on the problem of treatment and rehabilitation of patients with facial nerve neuropathy. Evaluation of the effectiveness of treatment of peripheral paralysis of the facial nerve by various methods of treatment in the acute period of the disease. Such treatment and rehabilitation measures as pharmacotherapy, kinesio taping and electroneuromyostimulation are considered.

Keywords: facial nerve neuropathy, rehabilitation, quality of life, kinesio taping

RELEVANCE.

Facial nerve neuropathy (FN) is one of the topical and widespread problems of modern neurology. Facial nerve lesions account for 11.8% of all diseases of the peripheral nervous system. In neurological hospitals, HLH patients can account for up to 28-33% of all hospitalized patients. The sudden development of unilateral paresis of facial muscles, is reflected in the psychoemotional sphere of patients, physical condition, often causing long-term disability and significantly reducing the quality of life. Despite the advances observed in recent years in the development of methods for treating neuropathy of the facial nerve, there are currently a large number of patients suffering from complications of the disease. The complication rate is quite high and, according to various observations, can range from 7.5% to 73%. It should be noted that in representatives of such professions as artists, teachers, announcers, contracture of facial muscles can cause partial or complete disability.

Physiotherapy is prescribed on the 7-10th day of the disease and is a necessary component of rehabilitation treatment. The goal of physiotherapy is to restore the function of the mymic muscles, and to prevent the development of complications. There are a wide variety of physiotherapy techniques used for NFN. In which they are exposed to infrared radiation, prescribe UHF, carry out magnetic therapy with alternating and constant magnetic fields, as well as laser therapy.

Physiotherapy is prescribed taking into account the clinical picture and electrodiagnostic data. In cases of pronounced asymmetry of the face, on the affected half, electrophoresis of calcium chloride, sodium salicylate, magnesium sulfate, potassium iodide, proserin, galantamine is used by the Bergonier half mask method. With high electrical excitability of facial muscles, galvanic and pulse currents are not used, since the procedures performed increase the likelihood of hyperkinesis and synkinesis. At the first sign of contracture, all

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stimulating types of physiotherapy are canceled. In order to prevent contractures in the early period, there is a method of combined effects of CMT and ultrasound.
The significant role of peripheral mechanisms in the pathogenesis of facial nerve neuropathy and secondary contracture of facial muscles determines the need to optimize pathogenetically based therapeutic measures, which include reflex methods (modeling of muscle-fascialsenment, physical therapy complex, electromyostimulation.
The absence in the professional literature of systematized information on the use of therapeutic exercises, modeling of the muscle-fascial segment in children, which form the basis of rehabilitation complexes in case of NFN, seriously limits the possibility of assessing their effectiveness. [4.5]

Purpose of the study — to develop, on the basis of neurophysiological methods, for the assessment of the complex rehabilitation of sick children with neuropathy of the facial nerve.
To solve the set tasks, 84 sick children were examined in the trigger-free period of the disease. Of these: boys - 32, girls - 52. The age of the subjects was from 5 to 15 years.
The clinical examination included: the study of complaints, anamnesis and objective data. On examination, the degree of paresis, impaired sensitivity, hearing, taste, and the state of secretion of the lacrimal glands were noted.
Laboratory examination: complete blood count, urine analysis, electroneuromyography. The degree of paresis was assessed using the Haus-Braakman scale. During the examination, all patients were divided into 2 subgroups: the main subgroup included 50 children, who, in addition to standard treatment, received electrostimulation with a four-channel device "Mioritm-040" on the affected side on the circular muscles of the eyes and mouth during the entire period of hospitalization. In addition, to prevent the occurrence of complications on the side of the lesion in the form of loss of physiological position (sagging) of the facial muscles, the reflex method of modeling the muscle-fascial segment was used. The control group included 34 children who were prescribed standard treatment (vasoactive, metabolic, decongestant, neurotrophic drugs). In the present study, we did not include patients with neuropathy of the facial nerve, which developed as a result of a tumor of the cerebellopontine angle, facial injuries, metastatic and leukemic infiltration. The effectiveness of therapy was assessed according to the data of a clinical neurological examination (the degree and speed of recovery of motor functions using the House-Braakman scale, the development or absence of contractures), the results of electromyography (the amplitude of the M-response, the speed of the motor impulse conduction). ENMG was performed for all subjects. [1,6,7]

RESULTS AND DISCUSSION.

In the main group, each patient was assigned electromyostimulation with a current of 20-40 mA for 15-20 minutes during the entire period of hospitalization. After the treatment, a control ENMG was carried out, which showed positive dynamics during impulse conduction and acceleration of the M-response. Additionally, for the main group on the affected side, kinesio tapes were applied to the occipital-frontal muscle, m. Lifting the angle of the mouth, small and large zygomatic muscles, to correct the position of facial muscles. The tape was stretched along the muscle from the bottom up for a supportive effect. The tape is glued to the skin and has an effect on muscle, vascular, nervous and connective tissue. Due to the fibrous

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structure, kinesio tape does not interfere with the respiratory function of the skin and the free drainage of the secretion of sweat and sebaceous glands. Kinesio tape can remain on the skin for 3-5 days, which allows it to be used with continuous therapeutic effect. Among the numerous effects of kinesio tape on the body, two main ones can be distinguished: mechanical and neuroreflex. The concept of the mechanical theory is to enhance the activation of microcirculation in the intercellular substance. An elastic tape glued to the skin activates microcirculation due to decompression. The local blood flow in the tissues improves, and inflammatory mediators are removed, thus realizing its lymphatic drainage effect.

Neuroreflex mechanisms are realized due to the activation of proprioceptors and the inclusion of reflex reactions of the central nervous system. Kinesio tape affects the skin-kinetic sensitivity by stimulating receptors in the skin, muscles, tendons, joints. The level of damage to the peripheral nerve is of great importance, since the options for the applied techniques depend on it. If the damage is localized in the nerve canal, then it is preferable to use laxative techniques in combination with lymphatic drainage correction.

In the control group, after the standard treatment without the use of electromyostimulation, control ENMG was also carried out, in which no changes were found in comparison with the previous study. When assessing the degree of paresis in both groups, paralysis was assessed from mild disturbances at rest to obvious, but not disfiguring asymmetry. The severity of facial nerve dysfunction was defined as moderate dysfunction (23% of patients), moderate dysfunction (50% of patients), and severe dysfunction (27%) according to the House - Braakman scale (Fig. 1).

Clinical and instrumental analysis of the level of damage to the facial nerve showed that most often in our patients the facial nerve suffered at the exit from the styloid foramen - 40%, less often in the bony canal above the knee - 25%, in 15% of cases - below the knee in the canal of the facial nerve ... The patients were followed up and treated for 1 month. Analysis of the study results showed that all patients had a clinical effect of varying severity. As can be seen from Diagram 1, in patients in the main group, when compared with the comparison group,

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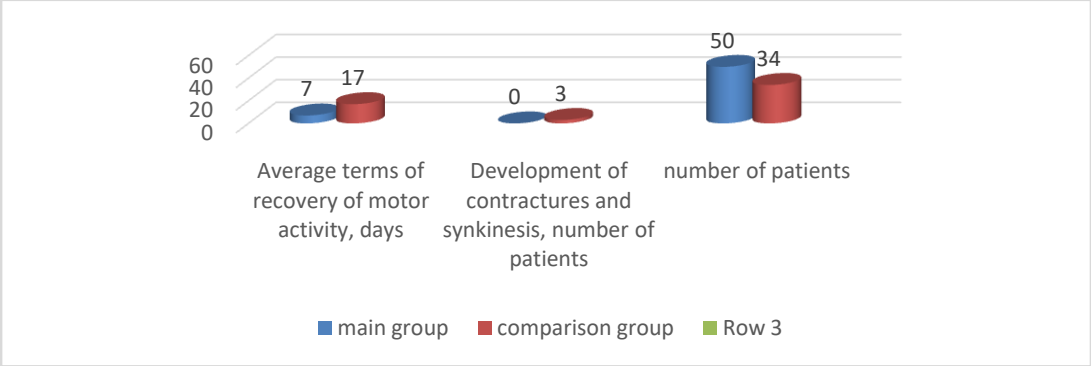
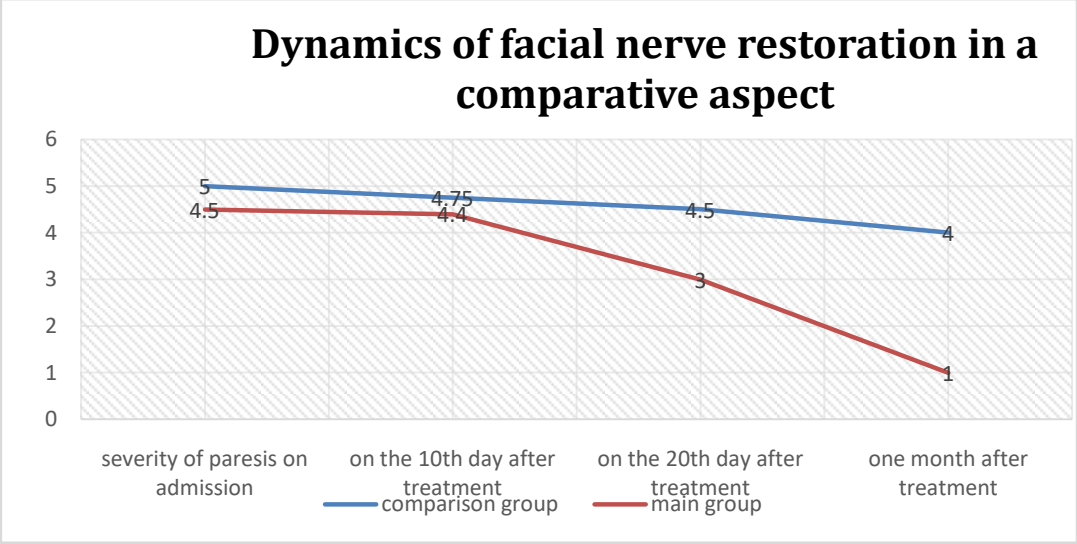
movement disorders regressed significantly faster, the motor activity of the facial muscles of the affected half of the face was restored.

Diagram 1.
Average terms of restoration of the function of the facial nerve



The movements of the facial muscles in the main group began to recover by the 7-10th days of therapy. In patients of the comparison group - by 15-17 days. Signs of contracture of facial muscles were noted in 3 patients of the comparison group in the form of pathological synkinesias. None of the patients of the main group, who received myostimulation of facial muscles, showed no gross signs of contracture. Full recovery by the end of the course of treatment was noted in the comparison group in 55%, in the main group - in 85% of patients. Patients who failed to achieve complete recovery were distributed as follows: in 20%, the degree of dysfunction decreased from severe to moderate, and in 25% - from moderate to mild. In the remaining 15% of patients in the main group, the degree of recovery passed from severe to mild. (see Diagram 2) Analysis of the effectiveness of therapy depending on the causative factor of the development of the disease and the level of damage did not show significant differences, which once again confirms the common pathogenesis of neuropathy of the facial nerve as compression-ischemic. This statement is also confirmed by the observation that persistent pain in the ear region was a bad prognostic sign. [5.6]

Diagram 2



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According to the literature, the results of electromyographic studies indicate that in the acute period of the lesion of the facial nerve up to 7–10 days from the onset of the disease, the conduction along the distal segment of the affected nerve remained intact. Subsequently, a decrease in the rate of conduction was noted, which lasted until the 14th – 21st day.

These data confirm the need to start treatment at the earliest possible date when there are no demyelination phenomena. Our studies have shown that the use of electromyostimulation in combination with standard therapy in the main group made it possible to achieve the most effective results, apparently due to the suspension of demyelination processes and the highest quality regeneration. In the same group of patients, according to our data, the greatest increase in the amplitude of the M-response was observed after the treatment (by 12%). [1,2]

No side effects were observed during therapy.

When re-measuring the degree of paresis after treatment of patients later in the main group, there was no contracture in the affected side and patients with the second degree of paresis and higher noted an improvement in movement in the facial muscles, while in the control group a different situation was observed: patients with the second degree of paresis and higher did not notice any noticeable dynamics after the standard treatment.

CONCLUSIONS.

Patients with neuropathy of the facial nerve are recommended to carry out electromyographic testing of the affected muscles in order to correct the treatment; Kinesio tapes, having a mechanical and neuroreflex effect on the affected facial muscles, stimulates the recovery treatment and rehabilitation of patients and it is necessary to apply this method in the early stages of the disease (from the first days of the disease) in order to prevent muscle contracture of the affected side or the formation of its lighter forms.

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