CLINICAL AND FUNCTIONAL EFFECTS OF MICROCURRENT NEUROSTIMULATION IN THE SYSTEM OF EARLY REHABILITATION OF CHILDREN WITH CONGENITAL MICROCEPHALY

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Relevance. Congenital microcephaly is classified as a severe organic disorder of the central nervous system and is accompanied by persistent impairments in motor, cognitive, and speech development, as well as a high prevalence of epileptic syndromes. Conventional treatment and rehabilitation methods do not always provide sufficient functional compensation, which determines the need to introduce new non-pharmacological technologies aimed at activating neuroplasticity and regulating the functional state of the brain.

Keywords: congenital microcephaly, children, microcurrent reflexotherapy, neurorehabilitation, psychomotor development.

Objective. To evaluate the clinical efficacy and safety of microcurrent reflexotherapy as part of a comprehensive rehabilitation program for children with congenital microcephaly.

Materials and Methods. The study included 260 children aged 6 months to 7 years diagnosed with congenital microcephaly. The patients were divided into a main group (n = 130), which received microcurrent reflexotherapy as part of comprehensive rehabilitation, and a control group (n = 130), which received standard treatment without the use of microcurrents.

The course of microcurrent reflexotherapy consisted of 15 procedures lasting 20 minutes each, using pulsed currents with an intensity of 80–200 μA and a frequency of 0.5–2 Hz, applied to biologically active zones of the head, the cervical–collar region, and acupuncture points. Treatment efficacy was assessed using the GMFCS, Bayley III, Denver II, PedsQL scales, the modified Ashworth scale, and electroencephalography. Statistical significance was set at $p < 0.05$.

Results. In the main group, after completion of the microcurrent reflexotherapy course, a statistically significant improvement in motor functions was observed: the mean GMFCS level decreased from 3.8 ± 0.6 to 2.9 ± 0.5 ($p < 0.01$), while the

proportion of children with mild motor impairments (levels I–II) increased from 12% to 34%. A reduction in muscle hypertonia was also noted, with a mean decrease of 1.1 points on the modified Ashworth scale ($p < 0.01$).

Cognitive performance assessed using the Bayley III scale increased by an average of 9.3 points in the main group ($p < 0.01$), whereas changes in the control group were less pronounced. Speech delay according to the Denver II test was reduced by more than twofold, from 6.5 ± 1.2 to 3.1 ± 0.8 months ($p < 0.01$).

A significant reduction in the frequency of epileptic seizures (by more than twofold) and a decrease in epileptiform activity on EEG indicated stabilization of the brain's bioelectrical activity. Head circumference measurements did not change significantly in either group ($p > 0.05$), confirming the functional rather than morphological nature of the therapeutic effects.

According to the PedsQL scale, quality of life scores for children and their families in the main group increased from 42 ± 10 to 68 ± 9 points ($p < 0.01$). Adverse effects of microcurrent therapy were mild and transient and did not require discontinuation of treatment.

Conclusions. Microcurrent reflexotherapy is an effective and safe method that enhances the outcomes of comprehensive rehabilitation in children with congenital microcephaly. Its application contributes to improvements in motor, cognitive, and speech development, a reduction in epileptic activity, and an overall increase in quality of life, thereby supporting its implementation in early neurorehabilitation practice.

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