

**THE NATURE OF ELECTRONEUROMYOGRAPHY INDICATORS IN CHILDREN  
WITH DEMYELINATING POLYNEUROPATHY**

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**ANNOTATION**

Acute inflammatory demyelinating polyneuropathy (AFP) in children is observed at a frequency of 1.1 per 100,000 population per year. A reliable association of AFDP with infections and a pathoimmune reaction has been proved, which leads to autoimmune tissue damage using the mechanisms of molecular mimicry. ENMG is the "gold standard" for examining such patients; conducting ENMG with an assessment of neural conductivity in case of short-term local ischemia showed its resistance.

*Keywords: Acute demyelinating polyneuropathy, children, ENMG.*

**RELEVANCE**

Cytomegalovirus infection is the second most common preceding GBS infection, manifested as a respiratory infection, and is usually observed in young women in whom the clinical picture is dominated by Cytomegalovirus initiates the development of a different variant of GBS in contrast to *Campylobacter jejuni*. A possible explanation for the development of GBS after cytomegalovirus infection may be the emergence of an autoimmune response to viral proteins, which also react with neural proteins (Pithadia A.B., 2010).

**AIM**

To study the character of electroneuromyography indices in children with demyelinating polyneuropathy.

**MATERIALS AND RESEARCH METHODS**

The work was carried out in the department of pediatric neurology and the intensive care unit of the 1st clinic of SamMI. A total of 46 children from 7 to 17 years old with a diagnosis of AID and 15 healthy children of the comparison group were examined. The diagnosis of ARDP in children was established in accordance with the WHO criteria (1993) and the neurophysiological criteria of R. Hadden (1998). The criterion for the average severity of the ATP corresponded to 1 to 3 points, the severe severity - from 3 to 7 points according to the functional status index.

All children with ARDP received basic therapy, which is indicated for any polyneuropathies, pathogenetic treatment, treatment of complications and rehabilitation therapy. In severe cases with the development of respiratory failure - ventilation of the lungs. All children with a severe course underwent programmed plasmapheresis in the first days of the disease in the amount of 35-40 ml of plasma / kg of body weight per procedure daily, and during sessions every other day - replacement of 40-50 ml / kg. During the course, 3-4 transfusions were carried out (up to 200 ml / kg). Rehabilitation therapy in patients with AIDP began from the first days of the disease. After the end of the period of increasing paresis and stabilization of the condition, children with AIDP underwent more active rehabilitation treatment: physiotherapy exercises, robotic mechanotherapy on a device with positive feedback and functional electrical stimulation Motion Maker (Switzerland) for about 10 sessions, anticholinesterase agents, vitamins.

Comprehensive clinical and neurological examination of all children with AIDP All children with AIDP underwent a general clinical examination according to the standard method with an assessment of cranial innervation, superficial and deep sensitivity, deep and superficial reflexes, pathological reflexes, assessment of the muscle strength of the extremities on a 5-point scale.

## **RESEARCH RESULTS**

ENMG results obtained in the acute period in all patients with AIDP (n = 46) had a primarily demyelinating nature of the peripheral nerve lesion of the polyneuropathic type and were consistent with the electrophysiological criteria of AIDP. In the acute period of AIR, there were disturbances in neural conduction at the terminals of motor axons in the form of an increase in residual latency of more than 3 ms along the ulnar nerve in 27% (n = 12) cases, along the median nerve in 100% (n = 46) cases, along the peroneal nerve in 83% (n = 38) of cases, along the tibial nerve in 77% (n = 35) of cases. On average, the slowing down of nerve impulse conduction along the terminals of motor axons was 16% for the ulnar nerve, 76% for the median nerve, 173% for the peroneal nerve, and 80% for the tibial nerve in relation to the VGN. In the acute period of AIRP in the distal areas (forearm, lower leg) of the peripheral nerves, neural conduction along motor fibers also had demyelinating changes in the form of a decrease in SPI along the ulnar nerve in 75% of cases (n = 36), along the median nerve in 62% of cases (n = 29), along the peroneal nerve in 45% of cases (n = 21), along the tibial nerve in 39% of cases (n = 18). A decrease in the amplitudes of DM responses in the acute period of AIRP reflected to a greater extent not the death of axons, since  $11 \pm 3$  days from the onset of the disease is not a sufficient period for the development of secondary axonal damage and muscle denervation (Garssen MP, 2007; Odinak M.M., 2009; Uncini A., 2010). A decrease in the amplitudes of dM responses in the acute period of AIRP was characterized by a decrease in axonal excitability of motor fibers due to impaired metabolic processes in nerve fibers and impaired axonal transport.

A decrease in the DM-response below the NGN was observed in the ulnar nerve in 85% of cases (n = 39), the median nerve in 92% of cases (n = 42), the peroneal nerve in 84% of cases (n = 37), the tibial nerve in 87% of cases (n = 40). The mean decrease and standard deviation ( $M \pm SD$ ) of dM-responses are presented in the integral table for electrophysiological parameters in the acute and the period of early convalescence of AIRP. A significant decrease in axonal excitability of sensory fibers of peripheral nerves up to the absence of registration of S-responses was noted in 39% of cases with stimulation of the ulnar nerve (n = 18), in 22% of cases with stimulation of the median nerve (n = 10), in 28% of cases with stimulation radial nerve (n = 13), in 33% of cases with stimulation of the superficial peroneal nerve (n = 15), in 24% of cases with stimulation of the sural nerve (n = 11).

The absence of registration of the H-reflex from the soleus muscle in children in the acute period of AIR was observed in 93% of cases (n = 43). The absence of the H-reflex is associated with the dispersion of the exciting discharge that travels along the sensory fibers to the motor neurons. Considering that in almost all cases the H-reflex was absent at the onset of the disease, it can be used as an additional criterion for the diagnosis of ARDP.

Thus, in the course of the study, 23 electroneuromyographic parameters were characterized in each child with AIDP (n = 46) in the acute period and in the period of early convalescence. In the acute period, the neurophysiological picture in all children had signs of acute primary demyelinating polyneuropathy and was consistent with the ARDP criteria. In the period of early convalescence (30 days after the onset of the disease), there was a significant improvement in the amplitude of the M-responses of the median and ulnar nerves, as well as the amplitude of the H-reflex, while the remaining 20 indicators of stimulation ENMG of neural conduction did not have significant dynamics in the period of early convalescence. Thus, the standard parameters of neural conduction in children with AIDP did not reflect the patho- and sanogenesis of peripheral nerves in demyelinating lesions.

Analysis of the dynamics of neural conduction under conditions of local ischemia showed that the RNP of the motor fibers of the ulnar nerve at 10 minutes of ischemia in children in the acute period of AIDP ( $11 \pm 3$  days from the onset of the disease) averaged  $3.3 \pm 0.9\%$  and after 30 days from the onset of the disease, RNP had significantly higher values of  $6.2 \pm 2.1\%$  ( $p < 0.05$ ). Thus, the RNP of the motor fibers of the ulnar nerve at 10 minutes of ischemia in children in the acute period of OVDP is on average 60% less ( $p < 0.00001$ ), in the period of early convalescence it is 30% less ( $p < 0.0006$ ) than in comparison group. In the course of the analysis of the dynamics of neural conduction in conditions of local ischemia, it was shown that in children with AIDP in the acute period of the disease there is resistance to ischemia of motor axons of peripheral nerves compared to the norm, in the form of a reduced RNP for ischemia with moderate severity -  $5.1 \pm 2.2\%$  and with severe severity -  $3.8 \pm 1.6\%$ . The revealed resistance to ischemia of nerve fibers in children with ARDP may be due to cytokine-mediated canalopathy and different reactions of myelinated and non-myelinated fibers to short-term ischemia.

Thus, in children with AIDP in the acute period, the greatest resistance of axons to ischemia is noted, in the form of a reduced RNP at 10 minutes of ischemia and with moderate severity it is  $5.1 \pm 2.2\%$ , with severe severity -  $3.8 \pm 1.6\%$ . In the stage of early convalescence, 30 days after the manifestation of AIDP, there is a reliable normalization of these indicators and with moderate severity is  $6.8 \pm 1.8\%$ , with severe severity -  $4.6 \pm 2.3\%$ . The reactivity of the neural conduction of the motor axons of the ulnar nerve at the 10th minute of ischemia correlates with the clinical picture of the severity of AIDP and the use of this stress test in the acute period of the disease makes it possible to determine the degree of damage to the peripheral nerves, as well as assess their reserve capabilities in acute ischemia.

## Conclusion

For the timely diagnosis of acute inflammatory demyelinating polyneuropathy, clarification of the severity of peripheral nerve damage, and the prognosis of restoration of motor functions, an improved method of short-term local ischemia of peripheral nerves can be used, based on the assessment of the reactivity of neural conduction along the motor fibers of the ulnar nerve at 10 minutes of ischemia.

Neural conduction in response to acute short-term ischemia has no age and gender differences in healthy children aged 7 to 17 years. The standard indicator of neural conduction reactivity of the motor fibers of the ulnar nerve at 10 minutes of ischemia in healthy children is  $8.6 \pm 1.9\%$ .

Motor axons of peripheral nerves in children in the acute period and early convalescence of inflammatory demyelinating polyneuropathy are resistant to acute ischemia. The reactivity of neural conduction to ischemia with moderate severity of the disease is  $5.1 \pm 2.2\%$ , while with severe severity of the disease -  $3.8 \pm 1.6\%$ .

## REFERENCES

1. Gafurova, Zh.F., Djurabekova, A.T., Abdullaeva, N.N., Yuldasheva, D. Sh.K., & Shmyrina, K.V. (2020). Analysis of acute disorders of cerebral circulation depending on early and late examination. Achievements in science and education, (3 (57)).
2. Gaybiev, A.A., Djurabekova, A.T., Shomurodova, D.S., & Abdullaeva, N.N. (2020). DIAGNOSTIC METHODS AND ADVANCED TREATMENT OF AXONAL POLYRADICULONEURITIS. Re-health journal, (2-3 (6)).
3. Igamova, S. S., Djurabekova, A. T., Shomurodova, D. S., & Niezov, Sh. T. (2019). Fundamentals of the effectiveness of the health-improving methodology of children who have undergone perinatal CNS

lesions Science and education issues, (27 (76)).

4. Isanova, S. T., Abdullaeva, N. N., Djurabekova, A. T., & Muxtarova, M. A. (2020). COGNITIVE CHANGES IN DISORDER OF IRON METABOLISM IN ADOLESCENTS WITH OBESITY. *Journal of Biomedicine and Practice*, 4(5).
5. Isanova, S., Abdullayeva, N., & Djurabekova, A. (2020). CHARACTERISTIC OF NEUROLOGICAL CHANGES IN OVERWEIGHT ADOLESCENTS. *InterConf*.
6. Sadriddinovn, Asadova Nozima, Djurabekova Aziza Taxirovna, and Igamova Saodat Suratovna. "CLINICAL AND ELECTROMYOGRAPHIC PREDICTION OF FACIAL NERVE NEUROPATHY IN CHILDREN." *Journal of Neurology and Neurosurgical Research* 3.1 (2020).
7. Saodat Igamova, Djurabekova Aziza, and Bazarova Aziza. "Changes in Psychomotor Development in Children with Perinatal Brain Hypoxia." *International Journal of Human Computing Studies* 2.5 (2020): 11-14.
8. Shavkatovich Shodjalilov Istatillo, Igamova Saodat Suratovna, and Djurabekova Aziza Takhirovna. "NEUROPSYCHOLOGICAL CHANGES IN PATIENTS WITH A CONSEQUENCE OF TRAUMATIC BRAIN INJURY." *Журнал неврологии и нейрохирургических исследований* 3.1 (2020).
9. Shodjalilov, I. Sh., Jurabekova, A. T., Abdullaeva, N. N., & Murodova, N.B. (2019). COGNITIVE AND MOTOR IMPAIRMENTS IN PATIENTS WITH A CONSEQUENCE OF Craniocerebral Injury. *Achievements in science and education*, (13 (54)).
10. Tulkinovna, I. S., Nurmamatovna, A. N., Takhirovna, D. A., Alisherovna, M. M., & Salimovna, S. D. (2020). Modern Views Of Obesity–Comorbidity. *The American Journal of Medical Sciences and Pharmaceutical Research*, 2(08), 27-36.

