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ELECTRONEUROMYOGRAPHIC FEATURES OF POLYNEUROPATHY IN CHILDREN

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Abstract: in this paper authors try to explore the problems of electroneuromyographic featuresof polyneuropathy in children and the ways of improvement.

Keywords: Children's Rehabilitation, diseases of bearing-movable System

Childhood disability is a medical and social problem of our time. According to specialists, by 2015 the number of newborns with congenital pathology will be 18-20% of the total number of children born. Functional deviations will be observed in 33-50% of cases, and 70% of cases will be primary damage to the musculoskeletal system.

Disruption of motor conduction is associated with damage to the brain, spinal cord, and peripheral nervous system. This leads to impairment of the function of a certain muscle or muscle group [4]. Recent studies show an increase in the number of disabled children in the RF [1]. According to a number of authors, children with disabilities are not provided with rehabilitation, social, and pedagogical assistance at an adequate level [3]. There is little information on effective rehabilitation assistance for disabled children. In this regard, the execution of the adopted resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On measures to optimize the

activities of specialized pre-school institutions" № 117 of June 18, 2010 is provided by improving the activities of specialized pre-school institutions, improving the effectiveness of activities carried out in these institutions with pre-school children in accordance with the order of the Ministry of Health of the Republic of Uzbekistan № 199 of 28.06.2010 to children with musculoskeletal disorders is significant complex of medical measures, improving the effectiveness of medical rehabilitation.

In the scientific literature there is no information about the mechanism of development of pathological process in the muscular tissue in case of damage to the neuromotor system, as a result of which the pathological process increases, and the patient needs orthopedic care, with the subsequent transition to a wheelchair and further bed rest. Children with limited mobility of the musculoskeletal system are embarrassed by their peers, feel socially restrained, as they constantly need specialized medical social and educational assistance. The largest group of disabled children are patients aged 5 to 14 years. The main group of disabled children (90%) are brought up at home [5]. Studies conducted in St. Petersburg have shown that disability among children has mainly increased due to increased morbidity of the nervous system [4]. For example, if in 2000 the disability among children was 3.91%. According to WHO data, in Europe, in 2004-2005, the disability associated with neurological diseases was 3.33%, and in 2009 it increased to 5% [5].

One of the main symptoms of spastic syndrome is high muscle tone. In children with low treatment efficacy, contracture and joint deformation are observed in 20-43% of cases [6]. Numerous studies have shown that in adhesions and muscles, deformities are accompanied by relapses in 44-50% of cases [3, 5]. A distinctive feature of treatment of patients with pathology of the neuromotor system is the prolonged use of rehabilitation, and the use of pharmaco-, physical therapy and the inclusion of orthopedic treatment leads to positive results. At present, the failure to

follow the mentioned principles of treatment does not give the expected results and leads to low efficiency of treatment.

Objective of the study: to study the clinical-electroneuromyographic features of polyneuropathy in children

Materials and methods of research: 42 patients, 21 boys and 21 girls, average age 7.19±0.72 years were examined in total. Patients with peripheral nervous system affection of musculoskeletal apparatus, in particular with polyneuropathy, were included in the study from 7 to 18 years old.

NIS-LL scale was used to estimate the severity of neurological deficit. The NIS-LL scale was calculated on the right and left legs with the sum of all the points obtained on each side.

On the basis of the obtained results the stage of pathological process was estimated: 0,5-8 points - stage of initial manifestations, 8,5-17,5 points - stage of developed clinical manifestations; above 18 points - stage of decompensation. The possibility of walking on the heels was assessed separately.

Assessment of the functional state of peripheral nerves was carried out on the electromyograph "NeuroMVP-5" (Neurosoft, Russia). Motor fibers of the lower limbs nerves on symmetrical areas and peroneus profundus - deep peroneus peroneus nerve (registration from a short extensor of toes - t. extensor digitonmi brevis) were studied with the help of stimulation ENMG. tibialis - tibial nerve (registration from the muscle, which withdraws the toe of the foot - m. abductor hallucis). The amplitude of motor response (M-response) at the distal point, excitation rate (ERV), resistive and terminal latency were assessed.

In the control group 22 healthy children were examined and ENMG was performed according to the same algorithm as in the group under study. Average age of children in the control group was 8.68±1.3 years.

No statistically significant differences in age and sex between the study group and the control group were revealed.

On the day of processing of the obtained results of the research the package of applied statistical programs Stafistica for Windows was used. Interval indices are presented in the form of "average±standard deviation". The differences at $p<0.05$ were considered significant in all cases.

In order to determine the most effective course of treatment, to compare the results of the effect in monoparesis, paraparesis and cerebrolysis, to reveal electromyographic changes before and after pharmacapauncture with cerebrolysis in three conditions, to determine the most effective course of treatment, to compare the results of the study with the data of the control group

Survey results: NIS-LL score of 6.74±0.6 among surveyed children. Clinical manifestations of polyneuropathy in the form of a steppage at walking of different degree of severity were noted in 12 patients (28,6 %), weakness of the extensor of 1-foot toe was revealed in 23 patients (54,8 %), absence of tendon reflexes from legs in 31 children (73,8 %). When assessing the possibility of walking on the heels, 12 children (28.6%) did not have any abnormalities of the function under study, 20 children (47.6%) had difficulty walking on the heels, and 8 children (19%) lost their ability to walk on the heels. Two children (4.8%) refused to demonstrate the skill. Children and their parents did not submit typical polyneuropathy complaints about sensory manifestations actively and when asked about them.

Types of sensitivity according to the NIS-LL scale were evaluated in 16 (38%) children from 7 to 17 years old. In this group of children, no sensory impairment was found. In one case, painful crampi in calf muscles at night were observed.

The changes in the NIS-LL scale in the right and left side evaluation were symmetrical, except in one case (boy, 16 years old) of unilateral peroneal tunnel

neuropathy at the fibular channel level with paresis to 1 point with the occurrence of asymmetrical neurological symptoms.

Changes in ENMG were as follows: when comparing the parameters in the study group with the control group, statistically significant differences in M-response amplitudes in the distal point of the peroneal nerve 1.56±0.15 mV (P<0.01), tibial nerve 9.13±0.68 mV (P<0.05), CPV on motor fibers of the tibial nerve 52.0±1.64 m/s (P<0.05) were obtained (Table 2) (Table 3). 1).

Table 1

Results of an ENMG study of motor nerve fibers. M±m

Indicator	Motor fibers, research group (n=42)			Motor fibers, control group (n=22)		
	m. EDB	m.AH	n.ADM	m. EDB	m.AH	n.ADM
Amplitude response, mV.	1,56±0,15 p<0,01	9,13±0,68 p<0,05	5,47±0,32 p<0,01	5,16±0,31	13,02±0,96	8,62±1,42
CPB, м/с	47,62±2,41	52,0±1,64 p<0,05	64,23±2,3	51,86±0,8	56,52±1,26	62,7±1,64
Real latency, мс	2,05±0,15	1,75±0,1	1,42±0,07	1,77±0,11	1,36±0,09	1,23±0,07
Latency, мс	3,07±0,2	2,98±0,15	2,39±0,14	2,69±0,14	2,79±0,15	2,06±0,09

A decrease in M-response amplitude for the peroneal nerve was observed in 100% of patients, including two cases of absence of clinical manifestations. The absence of clinical manifestations of sensory symptomatology can be explained by the predominant involvement of motor fibers in the pathological process. It is also necessary to take into account the peculiarities of childhood, when it is very difficult to objectify sensitive disorders.

The obtained changes in the ENMG parameters testified to the axonal factor of sensory and motor nerve fibers lesion.

The revealed decrease in SRV in motor fibers of the tibial nerve indicates the possible addition of secondary demyelination. This fact requires further study depending on age and on a larger sample.

Clinical manifestations of polyneuropathy were predominantly a motor deficit combined with a statistically significant difference in the reduction of M-response amplitude. Despite the fact that axonal lesion of sensory fibers was revealed electrophysiologically, there were no clinical correlates in the form of complaints and in the evaluation on the NIS-LL scale. In all cases, the polyneuritic character of the lesion was stated, in one case associated with tunnel mononeuropathy.

Conclusions:

1. Clinical manifestations of polyneuropathy are peripheral paresis of leg muscles with predominant extensor weakness, in the absence of sensory symptoms.

2. Analysis of clinical and electrophysiological data showed that the lesion of nerve fibers is axonal in nature. ENMG examination is highly informative, as it allows to detect electrophysiological changes before the appearance of objective symptoms. This is especially important due to the objective difficulties in assessing the degree of severity of symptoms in young children, as well as the preservation of tendon reflexes at early stages of lesion characteristic of axonopathies.

References

1. Kasatkina LF., Galvanova O.V. Electromyographic methods of research in diagnostics of neuromuscular diseases. Needle electro-myography. - M., 2010. -416

2. Levin O'S. Polyneiropathy. Clinical guidance. - M., 2005. –p. 495.

3. Leont'ev M.A., Malashenko M.M. Motor rehabilitation of disabled people with locomotor function disorders due to paralysis and paresis Methodological recommendations for physicians, methodologists and instructors. Novokuznetsk, 2002

4. Suponeva N A. Features of patient examination, differential diagnosis and the most common causes of acutely lax tetraparesis / NA. Suponeva, S.S. Nikitin, M.A. Piraedov // Neuromuscular diseases. - 2011. - № 1. - p. 5-12.

5. Koman L.A., Mooney J.F. 3rd, Smith B. et al. ...Paediatr Drugs 2003;5(1):11-23.

6. Nelson K. B., Ellenberg J. H. Apgar scores as Predictors of chronic neurological disability //Pediatrics. - – 2009. - Vol. 68, № 1. - – P. 36-44.