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## PARAMETERS OF STIMULATION ELECTRONEUROMYOGRAPHY OF DIABETIC POLYNEUROPATHY

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### ABSTRACT

The authors have studied the indices of parameters of stimulation electroneuromyography, namely: the amplitude of the M-response and the rate of conducting excitations along the motor nerve fibers n. medianus; n. ulnaris; n. tibialis, n. peroneus 3 and 6 months after a course of multimodality treatment with a supplementary prescription of mildronat and thiotriazolol in patients with diabetes mellitus and diabetic polyneuropathy.

*Key words:* diabetic poly neuropathy, diabetes.

**Introduction.** Diabetic polyneuropathy (DPN) is one of the most frequent complications of diabetes (D). It can occur at early stages of disease, but most often it is diagnosed in cases of long-term diabetes and when people are over the age of thirty. DPN leads not only to performance decrement or disability, but also it causes severe disabling injuries and death [1]. Clinical diabetic peripheral distal sensory-motor neuropathy is manifested in 25,8- 34% of patients, and subclinical sensory-motor neuropathy includes 100% of patients. Much prevalence of DPN causes importance of this pathology from practical and theoretical point of view [2, 3,4].

**Materials and methods.** Explore parameters of stimulation electroneuromyography (ENMG), namely: M-response amplitude and the rate of conducting excitations (RCE) along motor fibers n.medianus; n. ulnaris; n. tibialis, n. peroneus 3 and 6 months after combination treatment with the addition of Mildronat (MD) and Thiotriazoline (TTZ) in patients with D with DPN.

We have examined 30 in-patients with D type II in Chernivtsi Regional Endocrinology Clinic. Among the patients, there were 16 women and 10 men; the age patients ranged from 36 to 65 years old. D average severity was observed in 28 patients, 2 patients - critical. 7 patients were in the state of compensation of the disease, 23 - in the state of subcompensation. Patients were divided into 2 groups. The first group comprised the patients receiving basic therapy which included diet №9, Maninil to 5 mg twice daily or Insulin (2/3 daily dose in the morning and 1/3 evening dose rate of 0.7 - 1.0 U / kg body weight) Pentoxifylline 5 ml intravenously 250 ml isotonic sodium chloride solution, vitamins B6, B12 (14 patients). In second group there were the patients who received basic treatment, TTZ (2 ml 2.5% solution intramuscularly 1 daily for two weeks) and MD (5 ml of 10% solution intravenous bolus 1 daily) (16 patients). The control group consisted of 20 healthy people. The study of the functional state of peripheral nerves, was performed by stimulation electroneuromyography (ENMG) on the machine Neuro-MPV- 4 (Neurosoft, Russia).

**Results and discussions.** ENMG stimulation parameters, namely M- response amplitude and RCE along motor fibers. n. medianus; n. ulnaris; n. tibialis, n. peroneus 3 and 6 months after a combination treatment in thirty patients with D with DPN have been studied. The dynamics of the stimulation ENMG

3 and 6 months after basic treatment in patients with DPN is given in table. 1. The results of our research show that patients with DPN had reduction of M- response amplitude of nerves of upper and lower extremities 3 months after the therapy. After 6 months, these parameters did not differ significantly from the ones the patients had before the treatment.

The dynamics of the stimulation ENMG 3 and 6 months after additional prescribing MD and TTZ in patients with DPN is given in table 2. The table 2 shows that, 3 months after treatment with supplemental prescription of MD and TTZ, patients with DPN tended to have reduction of the amplitude of M-response. 6 months after treatment with simultaneous use of MD and TTZ, there was a possible decline of M-response amplitude of nerves of upper and lower extremities. Thus, the observed decrease in the amplitude of M-response of the median nerve was by 8.1%, of the elbow - 11.5%, of the tibial nerve - 15.9%, and of the peroneal - by 15.4% compared with those of patients after treatment.

The same parameters were obtained in the study of RCE along motor nerve fibers of the upper and lower extremities. So, 3 months after basic treatment, reduction in RCE along nerves of upper and lower extremities was observed. After 6 months, these parameters were hardly different from the ones the patients had before treatment. 3 months after treatment with the addition of MD and TTZ, patients with DPN had tendency to lower RCE along nerves of upper and lower extremities. 6 months after treatment possible decline of RCE motor nerve fibers of the upper and lower extremities was noted.

**Conclusions.** 1. At the base treatment, 3 months after of therapy, there is a decrease of RCE motor fibers of the upper and lower extremities and the amplitude of M-response. After 6 months these parameters hardly differ from the parameters of the patients before treatment.

2. At the base treatment with a supplemental prescription of MD and TTZ, there is a decrease of RCE along motor fibers of the upper and lower extremities and M-response amplitude only 6 months after the therapy that points to necessity of the retreatment.

Further research in this area will significantly improve the treatment of patients with diabetes complicated with neuropathy.

Table 1

The dynamics of parameters of stimulation electroneuromyography 3 and 6 months after treatment of diabetic polyneuropathy

Indices	Before treatment	In 2 weeks	In 3 month	In 6 month
The amplitude, (mV) n. medianus	4,8 +/-0,3	4,9+/-0,4 (p>0,05)	4,8+/-0,5 (p>0,05)	4,8+/-0,6 (p>0,05)
the rate of conducting excitations, (m/s) n. medianus	45,4+/-1,3	46,1+/-0,8 (p>0,05)	45,95+/-1,4 (p>0,05)	45,5+/-1,2 (p>0,05)
The amplitude, (mV) n. ulnaris	4,8+/-0,6			
	4,5+/-0,2	4,8 +/-0,2 (p>0,05)	4,7+/-0,3 (p>0,05)	4,6+/-0,4 (p>0,05)
the rate of conducting excitations, (m/s) n. ulnaris	49,5+/-0,6	50,1+/-0,9 (p>0,05)	49,9+/-0,6 (p>0,05)	49,6+/-0,7 (p>0,05)
the amplitude, (mV) n. tibialis	45,95+/-1,4			
	2,91+/-0,4	3,22+/-0,3 (p>0,05)	2,99+/-0,5 (p>0,05)	3,15+/-0,6 (p>0,05)
the rate of conducting excitations, (m/s) n. tibialis	36,5+/-0,4	38,2+/-1,1 (p>0,05)	37,5+/-0,5 (p>0,05)	37,9+/-0,4 (p>0,05)
The amplitude, (mV) n. peroneus				
	2,42+/-0,3	2,63+/-0,2 (p>0,05)	2,53+/-0,4 (p>0,05)	2,61+/-0,5 (p>0,05)
the rate of conducting excitations, (m/s) n. peroneus	44,3+/-1,2	45,4+/-1,4 (p>0,05)	44,9+/-1,3 (p>0,05)	45,2+/-1,5 (p>0,05)

Note: p - the probability compared with patients to treatment

Table 2

The dynamics of parameters of stimulation electroneuromyography 3 and 6 months after treatment of diabetic polyneuropathy with mildronate and thiotriazoline (M ±m)

Indices	Before treatment	In 2 weeks	In 3 month	In 6 month
The amplitude, (mV) n. medianus	4,8 +/-0,3	6,2+/-0,4 (p<0,05)	6,1+/-0,3 (p<0,05)	5,7+/-0,6 (p>0,05)
the rate of conducting excitations, (m/s) n. medianus	45,4+/-1,3	51,1+/-1,2 (p<0,05)	50,5+/-1,1 (p<0,05)	49,8+/-1,6 (p>0,05)
The amplitude, (mV) n. ulnaris	5,7+/-0,6			
	4,5+/-0,2	6,1+/-0,5 (p<0,05)	5,9+/-0,3 (p<0,05)	5,4+/-0,4 (p>0,05)
the rate of conducting excitations, (m/s) n. ulnaris	49,5+/-0,6	53,7+/-1,2 (p<0,05)	52,8+/-0,9 (p<0,05)	51,5+/-1,3 (p>0,05)
the amplitude, (mV) n. tibialis	50,5+/-1,1			
	2,91+/-0,4	4,58+/-0,5 (p<0,05)	4,25+/-0,3 (p<0,05)	3,85+/-0,6 (p>0,05)
the rate of conducting excitations, (m/s) n. tibialis	36,5+/-0,4	42,4+/-0,8 (p<0,05)	41,5+/-0,5 (p<0,05)	40,3+/-0,9 (p<0,05)

Note: p - probability compared with patients before treatment

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