

## Neuropathy

[Srp Arh Celok Lek.](#) 2007 May-Jun;135(5-6):257-63

### **[Influence of low-intensity laser therapy on spatial perception threshold and electroneurographic finding in patients with diabetic polyneuropathy]**

[Article in Serbian]

[Perić Z.](#)

**INTRODUCTION:** Low-intensity laser therapy (LILT) can be applied in cases when patients with diabetic polyneuropathy (DPN) suffer from chronic severe neuropathic pain. **OBJECTIVE:** We wanted to analyse influence of LILT on spatial perception threshold (SPT) and electroneurographic (ENG) parameters in patients with painful DPN. **METHOD:** We analysed 45 patients (25 males), average age 54.3 years (54.3 +/- 10.9), with clinical and ENG signs of painful DPN. The patients were divided into two groups: A and B. Group A consisted of 30 patients with DPN who had 30 LILT treatments over the period of 12 weeks and group B consisted of 15 patients with DPN who received only vitamin therapy per os within the same period. Prior to and after 12 weeks of treatment, the following ENG parameters were determined using surface electrodes: motor (MCV) and sensory conduction velocities (SCV) values (in m/s) of nervus (n.) peroneus (NP), n. tibialis (NT) and n. medianus (NM) and their motor distal latency (MDL) values (in ms). SPT value (score as number from 1 to 8) was determined with Tactile Circumferential Discriminator on dorsal part of foot's big toe skin. For statistical analysis, we used Student's t-test and Pearson correlation (sig. 2 tailed) study. **RESULTS;** We registered statistically significant difference between SPT ( $p < 0.01$ ) values prior to (5.25 +/- 1.11) and after (4.87 +/- 0.90) LILT, as well as NMMCVCV ( $p < 0.05$ ) values prior to (47.18 +/- 5.08) and after (49.12 +/- 3.72) LILT. Besides, we registered, only after LILT, statistically significant correlation between SPT and NMDML ( $p < 0.01$ ) values and also between SPT and NMSCVCV ( $p < 0.05$ ) values. The differences and correlations between other analysed parameters before and after treatments were not significant ( $p > 0.05$ ). **CONCLUSION:** In this study we registered significant decrease of SPT and increase of NMMCVCV after LILT and that indicated a favourable effect of this treatment in analysed patients with painful DPN. In our opinion these results need further investigation.

J Am Podiatr Med Assoc. 2005 Mar-Apr;95(2):143-7.

## **Improved sensitivity in patients with peripheral neuropathy: effects of monochromatic infrared photo energy.**

**DeLellis SL, Carnegie DH, Burke TJ.**

Gulf Coast Foot, Ankle and Wound Center, Tarpon Springs, FL, USA.

The medical records of 1,047 patients (mean age, 73 years) with established peripheral neuropathy were examined to determine whether treatment with monochromatic infrared photo energy was associated with increased foot sensitivity to the 5.07 Semmes-Weinstein monofilament. The peripheral neuropathy in 790 of these patients (75%) was due to diabetes mellitus. Before treatment with monochromatic infrared photo energy, of the ten tested sites (five on each foot), a mean  $\pm$  SD of 7.9  $\pm$  2.4 sites were insensitive to the 5.07 Semmes-Weinstein monofilament, and 1,033 patients exhibited loss of protective sensation. After treatment, the mean  $\pm$  SD number of insensate sites on both feet was 2.3  $\pm$  2.4, an improvement of 71%. Only 453 of 1,033 patients (43.9%) continued to have loss of protective sensation after treatment. Therefore, monochromatic infrared photo energy treatment seems to be associated with significant clinical improvement in foot sensation in patients, primarily Medicare aged, with peripheral neuropathy. Because insensitivity to the 5.07 Semmes-Weinstein monofilament has been reported to be a major risk factor for diabetic foot wounds, the use of monochromatic infrared photo energy may be associated with a reduced incidence of diabetic foot wounds and amputations.

Adv Skin Wound Care. 2004 Jul-Aug;17(6):295-300.

## **Reversal of diabetic peripheral neuropathy and new wound incidence: the role of MIRE.**

**Powell MW, Carnegie DE, Burke TJ.**

Northwest Orthopedic Center, Springdale, AR, USA.

**OBJECTIVE:** To determine if improved foot sensitivity to the Semmes-Weinstein 10-g (5.07) monofilament, originally impaired because of diabetic peripheral neuropathy, might be associated with a reduced incidence of new diabetic foot wounds.

**DESIGN:** Retrospective cohort study using a health status questionnaire.

**SUBJECTS:** Sixty-eight individuals over age 64 with diabetes, diabetic peripheral neuropathy, and loss of protective sensation who had clinically demonstrable increases in foot sensation to the Semmes-Weinstein monofilament after treatment with monochromatic near infrared photo energy.

**MAIN RESULTS:** After reversal of diabetic peripheral neuropathy following treatment with monochromatic near infrared photo energy, only 1 of 68 patients developed a new diabetic foot wound, for an incidence of 1.5%. Comparatively, the incidence previously reported in the Medicare-aged population with diabetes was 7.3%.

**CONCLUSIONS:** Improved foot sensitivity to the Semmes-Weinstein monofilament in patients previously suffering from loss of protective sensation due to diabetic neuropathy appears to be associated with a lower incidence of new diabetic foot ulcers when compared with the expected incidence in the Medicare-aged population with diabetes.  
**CLINICAL RELEVANCE:** Therapeutic interventions that effectively improve foot sensitivity that has been previously diminished due to diabetic peripheral neuropathy may substantially reduce the incidence of new foot wounds in the Medicare-aged population with diabetes.

Vopr Kurortol Fizioter Lech Fiz Kult. 2002 Jul-Aug;(4):25-7.

### **[Laser therapy and electric stimulation in rehabilitation treatment of peripheral neuropathy]**

[Article in Russian]

**Miriutova NF, Abdulkina NG, Luksha LV, Levitskii EF.**

73 patients with compression-ischemic myeloradiculopathy received treatment including infrared laser radiation on the paravertebral fields, motor points of the affected nerves and biologically active points Y63, Y67, YB34, YB42, YB43, E34, E42 (1.0-5.0 mW/cm<sup>2</sup>; 5 and 5000 Hz), electrostimulation of motor nerve points and innervated by them muscles by double square impulses with a fixed gap 5 ms. Impulse infrared laser therapy relieves pain syndrome, stimulates repair processes in the affected nerve structures. Further modified electric stimulation activates a regenerative growth of the nerve fibers, reinnervation of the limb muscles.

Lik Sprava. 2002 Jul-Sep;(5-6):62-5.

### **[Use of physical factors in the complex therapy of patients with diabetic angio- and polyneuropathies of the lower extremities]**

[Article in Ukrainian]

**Shablinskaia NB.**

Results are submitted of treatment of 110 patients with diabetes mellitus (61 male and 49 female subjects) presenting with angio- and polyneuropathies of the lower extremities. 70 patients, in addition to a drug therapy, were administered physiotherapeutic treatments, such as amplipulsetherapy, darsonvalization, and laserotherapy. Forty patients received medicamentous therapy only. Based on clinical findings and laboratory methods of investigation expediency has been shown of employment of physiotherapeutic methods in the treatment of the above pathology.

J Am Podiatr Med Assoc. 2002 Mar;92(3):125-30.

## **Symptomatic reversal of peripheral neuropathy in patients with diabetes.**

**Kochman AB, Carnegie DH, Burke TJ.**

The Medical Center of Aurora, Aurora, CO, USA.

Forty-nine consecutive subjects with established diabetic peripheral neuropathy were treated with monochromatic near-infrared photo energy (MIRE) to determine if there was an improvement of sensation. Loss of protective sensation characterized by Semmes-Weinstein monofilament values of 4.56 and above was present in 100% of subjects (range, 4.56 to 6.45), and 42 subjects (86%) had Semmes-Weinstein values of 5.07 or higher. The ability to discriminate between hot and cold sensation was absent (54%) or impaired (46%) in both groups prior to the initiation of MIRE treatment. On the basis of Semmes-Weinstein monofilament values, 48 subjects (98%) exhibited improved sensation after 6 treatments, and all subjects had improved sensation after 12 treatments. Therefore, MIRE may be a safe, drug-free, noninvasive treatment for the consistent and predictable improvement of sensation in diabetic patients with peripheral neuropathy of the feet.

## **[Laser therapy and cryomassage in rehabilitation of patients with facial nerve neuropathy]**

[Article in Russian]

**Maslovskaia SG, Gusarova SA, Gorbunov FE, Strel'tsova EN.**

Cryomassage and its combination with low-intensity infra-red laser radiation have been introduced as a novel treatment of facial nerve neuropathy (FNN) in 32 patients. Electrophysiological investigations (facial thermography, classical electrodiagnosis, electromyography of the mimic muscles) and clinical data including those of long-term follow-up show that neither cryomassage nor infra-red laser radiation studied promote transformation of facial tissues in FNN patients. Use of the above factors is effective in a preclinical stage of forming contracture of the mimic muscles. Special techniques of application of local hypothermia and laser radiation can be used in multimodality treatment of both the established contracture and sluggish paresis of the facial muscles.

## **HELIUM-NEON LASERTHERAPY IN TREATMENT OF FACIAL NERVE NEUROPATHY**

A. Scherbonosova, V.V. Skupchenko  
Medical university, Far Eastern Medical Center, Khabarovsk, Russia

Facial nerve damage is the result of different factors influence and it appears at the background of ischemia anoxia. Elimination of a local pathologically fixed ergothromages ischemia condition with the help of helium-neon laser therapy (FTNLT) has been conducted taking into consideration initial vegetative pattern of patients. It

allowed to adjust treatment methods based on laser effect individually for every patient. Mimic muscles function restoration in the course of treatment had begun after 5 treatment sessions with HHLT and matched vegetative status normalization as well as reofaciogram, ultrasound Dopplerography of temporal and ophthalmic arteries and general conjunctive index. Thus, HHLT is a gentle corrector of vegetative homeostasis and sanogenic mechanisms. It allows to synchronize local and cerebral hemodynamics rhythms and trigger reparative regeneration of the facial nerve.

Zh Nevrol Psikhiatr Im S S Korsakova. 1998;98(6):23-5.

### **[Infrared laser therapy in distal diabetic polyneuropathy]**

[Article in Russian]

[Kalinina OV](#), [Alekseeva NV](#), [Burtsev EM](#).

A course of laser therapy was applied to 50 patients with diabetic polyneuropathy by laser irradiation of low intensiveness in the nearest infrared spectrum. 20 patients from the group were treated by monotherapy only by laser exposure. Control group consisted of 24 patients treated by conventional therapy without laser exposure. According to the changes of vibratory and algesic sensitivity and electromyographic data the efficiency of therapy was estimated. It was found that laser exposure resulted in more pronounced restoration of functional state of nervous fibers than conventional therapy. Application of laser irradiation of low intensiveness was effective while in combined therapy of distal diabetic polyneuropathy as well as monotherapy.

### **Infrared laser therapy influence on blood circulation in patients with diabet distal polyneuropathy.**

Protasyeva L.G., Burtsev E.M., Alekseyeva N.V., Osnovina I.P., Cheida A.A., Nazarov S.B. I.S.M.A. Ivanovo. Russia.

96 patients with DDPNP received infrared lasertherapy. Their bloodflow including parameters of microcirculation issas carefeully exarnined.

Laser therapy stimulated microcirculation in both groups of patients with microcirculation disorders alone and with the combination of marked micro -and makrocirculation therapy disturbances. High effectiveness of Laser in DDPNP was proved.

Authors conclude that laser therapy is a pathogenic method of DDPNP treatment.

Proc. 2nd Congress World Assn for Laser Therapy, Kansas City, September 1998; p. 28

## **Laser irradiation suppresses hyperalgesia in neuropathic rats.**

**Katsuyama I et al.**

Katsuyama studied the effect of 830 nm laser in a neuropathic pain model of rat. The left side sciatic nerves of two groups of rats were ligated loosely to produce a neuropathic pain. The latency of the foot withdrawal reflex to noxious heat stimuli was measured before the ligation, immediately after laser/placebo radiation and at 14 days after ligation. The laser group received 72 J through the dermis. This group showed a significant reduction in left foot withdrawal immediately after irradiation and at 14 days, the right foot being unchanged. Placebo irradiation did not change the latency in the ligated in the ligated group, nor in non-ligated rats.