

Effect of low-level laser irradiation on in vitro function of pancreatic islets.

Irani S, Mohseni Salehi Monfared SS, Akbari-Kamrani M, Ostad SN, Abdollahi M, Larijani B.

Students' Scientific Research Centre, Tehran University of Medical Science, Tehran 1411413137, Iran.

INTRODUCTION: Although islet isolation and transplantation techniques have improved extensively in recent years, the loss of healthy functional islets is one of the major obstacles in this enterprise. A biostimulatory effect of low-level laser irradiation has been proven on proliferation of some kinds of cells. The aim of this study was to evaluate the effect of low-level laser irradiation on the function of isolated rat pancreatic islets after 24 hours of preculture.

METHODS: Pancreatic islets isolated from male rats (250 to 300 g) were cultured for 24 hours in RPMI 1640 media. Groups of islets then received different energy densities (1, 3, 5 joules/cm²) or silent) at 2 wavelengths (810 nm and 630 nm) using laser devices. Insulin concentrations in buffer media were measured as indices of islet function. **RESULTS:** Irradiation of incubated islets with 830 nm low-level laser significantly increased insulin secretion after a glucose challenge test ($P < .05$). There was a significant increase in insulin secretion after irradiation with joules/cm² 630 nm energy density ($P < .001$).

CONCLUSION: These findings suggest that low-level laser irradiations improved islet cell function before transplantation.

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THE LOW INTENSIVE LASERTHERAPY OF THE LATE COMPLICATIONS OF DIABETES MELLITUS?

V.A.Galenok, O.V.Sazonova, S.P.Thechova, O.N.Nikiforov

Novosibirsk Medical Institute, Russia

The results of the low intensive laserotherapy (LILT) were assessed in patients with diabetic angiopathies. The authors used infra-red laser, worked in impulse regime with outcome capacity of 5 watt. Biological active points were found with the help of Electrone Marker of Acupuncture Points and were

influenced for 16-20 seconds each, 3-15 minutes in general. The course of the laserotherapy (LT) consisted from 10-12 treatments. The results were analysed according to the clinical and laboratory methods, including the study of the lipid peroxidation (LP) with the help of malonil dialdehyd (MDA) level in serum. The functional status of the blood flow was tested by the retrobulbar conjunctivas biomicroscopy, rheoencephalo- and rheovasography. After LT clinical improvement (grow warmer of the extremities, decrease or disappearance of pain, cramps and parasthesies) was marked in 89% of patients. Normalisation of the small arteriole tonus, improvement of the pulse curve form and configuration, as well as pulse blood filling in caroted and vertebral arteries, decrease of the irregularity of the retrobulbar conjunctivas vessels gauge with partial or total disappearance of sladge-phenomenon were shown. The restoration of the blood flow promoted improvement of the electro-, encephalo- and miographical indexes. The tendency to the normalisation of LP was marked as well. MDA level decreased from 13.4 ± 0.56 to 10.9 ± 1.2 mmol/l, but stayed higher than in donors (5.5 ± 0.17 mmol/l). These data confirm the positive influence of LILT at LP, function of the central and peripheral blood flow and permit to use LILT in the complex therapy of the vascular complications in diabetes mellitus.

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Diabetic distal symmetric polyneuropathy: effect of low-intensity laser therapy.

[Khamseh ME¹](#), [Kazemikho N](#), [Aghili R](#), [Forough B](#), [Lajevardi M](#), [Hashem Dabaghian F](#), [Goushegir A](#), [Malek M](#).

Abstract

Low-intensity laser therapy (LILT) has been considered as a treatment modality in diabetic distal symmetric polyneuropathy (DSP). The aim of this study is to determine the effectiveness of LILT on DSP. We examined 107 subjects with type 2 diabetes for detection of DSP using the Michigan Neuropathy Screening Instrument (MNSI). Seventeen subjects were eligible to be enrolled in the study. Nerve conduction studies (NCS) were performed in all eligible subjects as an objective method to confirm neuropathy. The participants received LILT three times a week for ten sessions. NCSs were reevaluated after completion of the treatment. The absolute changes in NCS parameters were considered to establish the effectiveness of the treatment. Baseline demographics were similar in all participants. The mean differences of NCV parameters were considered for comparison. At the end of the study,

the subjects showed a significant increase in neural potential amplitudes ($p < 0.05$). This study clearly demonstrated a significant positive effect of LILT on improvement of nerve conduction velocity on diabetic distal symmetric polyneuropathy (DSP). This finding supports the therapeutic potential of LILT in DSP.

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