



## **Low Level Laser Therapy & myocardial infarction clinical research**

The use of laser therapy and physical exercises in myocardial infarction patients at the hospital stage

[Kuimov AD](#), [Beliavskaia NV](#), [Barbarich VB](#), [Potanina LM](#), [Metelkina NV](#). *Vopr Kurortol Fizioter Lech Fiz Kult.* 1995 Nov-Dec;(6):14-6. [Article in Russian]

89 postmyocardial infarction patients were exposed to low-intensity laser radiation combined with muscular training. The treatment improved clinical condition of the patients, myocardial contractility, exercise tolerance.

### **THE DEVIATION OF SOME HEMORHEOLOGICAL INDICATORS AMONG THE PATIENTS WITH ACUTE MYOCARDIAL INFARCTION AFTER INFRARED LASER THERAPY**

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The article deals with hemorheological and clinical aspects of therapeutic effects of lowlaser therapy in patients with acute myocardial infarction. 20 patients were investigated by laser therapy together with traditional treatment (1), and 20 patients - only by traditional treatment (2). The treatment was carried out by means of infrared laser 'Vector' in persistent regime. The region of projection of carotid sinuses and heart, expositions 3 min. The levels of fibrinogen, platelet aggregation, blood viscosity, antithrombin III, fibrinogen fragments were investigated before applying laser light and on the 5th and the 10th day after the treatment. Laser therapy lessened cardiac pain and arrhythmias. The improvement of the clinical state of the patients was accompanied with improvement of hemorheological properties. The impact of laser therapy on fibronectin level which rose from  $245 \pm 19,4$  to  $310 \pm 21,2$  on the 10th day and on antithrombin III level which changed from  $56,3 \pm 3,5$  to  $75,8 \pm 6,2$  was statistically significant. The amount of fibrinogen fragments decreased on 16% ( $p < 0,05$ ). Normal data of blood viscosity, fibrinogen, platelet aggregation was obtained on the 10th day. Each of these factors reflects its positive effect on the disseminated intravascular coagulation. The results showed, that laser therapy improved hemorheological properties of blood, which can be compared with the improving of clinical state of the patients with acute myocardial infarction.

Longterm experience of endovascular laser irradiation in myocardial infarction. Maximov N I et al. HeNe intravenous laser irradiation is reported to decrease the reinfarction rate in patients with a story of myocardial infarction. A 2 mW HeNe laser was used, 40 min. duration each session

**Impact of low level laser irradiation on infarct size in the rat following myocardial infarction. Ad N, Oron U. Int J Cardiol. 2001; 80:109-116.**

The effect of LLLI on the development of acute myocardial infarction (MI) was investigated following chronic ligation of the left anterior descending (LAD) coronary artery in laboratory rats. The hearts of 22 rats were laser irradiated (LI) using a diode laser (804 nm, 38 mW power output) through the intercostal muscles in the chest following MI and on day 3 post MI. In the control non laser irradiated (NLI) group (19 rats) MI was induced experimentally and laser irradiation was not applied. All rats were sacrificed 21 days post MI. Size, thickness and relative circumferential length of the infarct, as well as other parameters, were determined from histological sections stained with Masson's trichrome and hearts stained with triphenyl tetrazolium chloride (TTC) using histomorphometric methods. The infarct size (expressed as percent of total left ventricle area) of the LI rats was  $10.1 \pm 5.8$ , which was significantly lower (65%;  $P < 0.01$ ) than the infarct size of NLI rats which was  $28.7 \pm 9.6$ . Correlatively, the ratio of circumferential length of the infarcted area was significantly lower (2-fold;  $P < 0.01$ ) in the LI rats as compared to the NLI rats. LLLI of the infarcted area in the myocardium of experimentally induced MI rats, at the correct energy, duration and timing, markedly reduces the loss of myocardial tissue. This phenomenon may have an important beneficial effect on patients after acute MI or ischemic heart disease.

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