

## Myocardial Infarction

[Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2007 Jul-Aug;(4):12-5.

### **[Therapeutic effects of laser therapy in patients with silent myocardial ischemia]**

[Article in Russian]

[Krysiuk OB](#), [Ponomarenko GN](#), [Obrezan AG](#).

The technique of registration of pain and vibration sensitivity providing early diagnosis of painless ischemic heart disease is described. Basing on evident pathogenetic direction of a therapeutic action of laser therapy to different links of pathogenesis of arterial hypertension and ischemic heart disease, therapeutic effects of laser therapy in patients with painless myocardial ischemia in combination with essential hypertension were studied.

[Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2006 Mar-Apr;(2):6-8.

### **Effect of low-intensity laser radiation on lipid metabolism and hemostasis in patients with myocardial infarction**

[Article in Russian]

[Kemalov RF](#).

Progression of coronary atherosclerosis often causes complications resulting in myocardial infarction, early disability and death of patients with coronary heart disease. Low efficacy of medicines against coronary atherosclerosis progression after myocardial infarction gave rise to investigations of nonpharmacological methods, laser radiation, in particular. Our study shows a noticeable positive effect of low-intensity laser radiation on blood lipid spectrum and hemostasis. This makes laser therapy promising in combined rehabilitation of postmyocardial infarction patients.

Ross Fiziol Zh Im I M Sechenova. 2003 Dec;89(12):1496-502.

### **[Effect of the He-Ne laser irradiation on resistance of the isolated heart to the ischemic and reperfusion injury]**

[Article in Russian]

**Kolpakova ME, Vlasov TD, Petrishchev NN, Vislobokov AI.**

St.-Petersburg Acad. I. P. Pavlov State Medical University, 197089, Russia, St.-Petersburg, L. Tolstoy st., 6/8.

The aim of this work was to investigate the myocardial protection against ischemia/reperfusion using low level laser irradiation (LLLI). It has been shown that pulse pressure was higher in the period of post-ischemic reperfusion as compared with the control group. It provided a better restoration of myocardial contractility as well as increasing of coronary flow in the reperfusion period. The amount of ventricular rhythm disorder episodes decreased. These effects of laser application were registered in conditions of coronary flow reduction less than 50%. One of the suggested mechanisms of laser effect is an ATP-sensitive channel activation.

Vopr Kurortol Fizioter Lech Fiz Kult. 1995 Nov-Dec;(6):14-6.

### **[The use of laser therapy and physical exercises in myocardial infarct patients at the hospital stage]**

[Article in Russian]

[Kuimov AD](#), [Beliavskaia NV](#), [Barbarich VB](#), [Potanina LM](#), [Metelkina NV](#).

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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Moscow State University, Russia

The article deals with hemorheological and clinical aspects of therapeutic effects of low-laser 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, anti-thrombin 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.