



Low Level Laser Therapy & Diabetes testimonials followed by clinical research

Diabetes

Robert Rumph, Given

I have been having a terrible time controlling my diabetes. I was using the cold laser (low level laser) treatment in front (going through the stomach) under the first rib and was getting nothing done- no results and couldn't figure out what might be wrong with the instrument. I went to Gillette to see my doctor and she said the spleen is in the front; to get to the pancreas; you need to laser on the back (left side) below the first rib.

I've been using the laser on my pancreas now for a week. When I started, my blood sugar was 254; she said I'll let you go for another 3 or 4 months to see if you can get your blood sugar down. But if you can't you'll have to go on insulin.

We came home and I started using the laser on my back and my blood pressure started dropping about 20 points everyday! It went from 245 to 220 down to 210 then to 180. On January 1 it was 184 then dropped to 161 then again to 153 then to 136 and after that to 133. Today it was at 96 on one machine and 121 on the other. That's down from 254 in a week's time!

Pat Weldy

22 units per day was the usual insulin usage. In two treatments using LLLT on the pancreas and an Acupressure points on the hand, she has Reduced Insulin requirements to 2 units per day. She continues to use the laser once per week because it helps her feel so good.

Clinical-pathogenetical aspects of combined laser therapy efficiency use in patients with diabetes mellitus, as compared with pharmacologic therapy.

T.V. Kovalyova et al

Izhevsk State Medical Academy, 2nd Municipal Out-Patient Department, Izhevsk, Russia The use of combined laser therapy (CLT) in the treatment of patients with diabetes mellitus (DM) is a method of choice, allowing to reduce the pharmacologic dependence or to even avoid the intake of numerous drugs.

According to our long-term observations, the use of CLT allows to decrease the doses of sugarcorrecting medications in patients with insulin-dependent and non-insulindependent diabetes mellitus 1,5-2 times in the result of the first course of treatment. The application of CLT in patients with diabetic angiopathy of the lower limbs vessels corrects the disorders of macro- and microdynamics, hemorheology and immunity. The course treatment of such patients allows to preserve the stable compensation of diabetes mellitus and to stop the progression of diabetic angiopathy. Thus, the wide application of CLT in medical practice gives the real possibility to reduce the death rates of diabetic patients of cardio-vascular diseases, coronary heart disease, severe renal pathologies, gangrene and other diabetic complications. It also improves the quality of life and capacity for work.

Dynamics of hyperlipidemia and peripheral blood flow in patients with diabetes mellitus after the course of combined laser therapy in ambulatory-polyclinic conditions. Oprysko T V et al. 218 patients with DM were treated with laser blood irradiation. 93 patients had DM I type and 125 DM II type. A HeNe laser of 2 mW was used intravenously. In addition an infrared 890 nm laser (5-20 mW) was used for irradiation over the projections of the liver, spleen and pancreas. Treatment was given daily for a period of 8 days. Repeated sessions were given at 3 and 6 months. Sugarcorrecting medications were decreased 200%. From the first day the patients' extremities grew warmer, pain decreased and symptoms of encephalopathy decreased. Levels of total blood cholesterol, LDL cholesterol and triglycerides decreased to normal values with a simultaneous increase of alhpa-LP. Sugar concentration in blood also decreased.

~Czech Society for the Use of Laser in Medicine

Ambulatory Application of Combined Laser Therapy in Patients with Diabetes Mellitus and Dyslipidemia

Laser Partner, 17.5.2002

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Abstract

This study sought to evaluate the dynamics of lipid metabolism in blood plasma and clinical efficiency of combined laser therapy (CLT) in patients with diabetes mellitus.

Introduction

Atherosclerosis in patients with diabetes mellitus (DM) is characterized by early development and spreading, that enables to speak about DM as a natural model of atherosclerosis [5]. DM and atherosclerosis are diseases with similar lipid disorders accompanied by hypercholesterolemia, hypertriglyceridemia and hypoalphacholesterolemia [5]. It is established that under insulin dependent DM (IDDM) hyperlipoproteinemia is secondary. It results from absolute insulin insufficiency and reduction of lipoprotein lipase activity. Hyperlipoproteinemia may be reversible provided that it is effectively treated. Besides, any dyslipoproteinemia under DM is not only a strong risk factor for the development of atherosclerosis, but also is one of the leading factors in a specific microangiopathy pathogenesis [1,2]. "Usual" for DM patients hypoxia is considerably intensified under dys- and hyperlipoproteinemia, simultaneously increasing insulin deficiency and decreasing receptor sensitivity of cells. It hampers the treatment of patients and promotes the progression of diabetic microangiopathies. Patients with NIDDM are not protected from CHD caused by qualitative and quantitative changes of blood lipoproteins (LP) [3]. Out of quantitative LP changes characteristic of NIDDM are hypertriglyceridemia and high-density lipoprotein cholesterol reduction [6,15,16,20,25,27] on early stages of the disease [9], which are registered in 20% patients [17,22,26]. According to some investigations [4,7,14] the most common lipid disorder under NIDDM is combined hyperlipidemia, revealed in the high levels of triglycerides (TG), total cholesterol (TC), low-density lipoprotein cholesterol (LDL-c) and the reduced level of high-density lipoprotein cholesterol (HDL-c). The most usual lipid

disorder under NIDDM is hypertriglyceridemia, in most cases type IV, generally stipulated by the intensified very low-density lipoproteins cholesterol (VLDL-c) synthesis [5]. The HDL-c reduction is revealed both under newly established NIDDM and in patients with a prolonged diabetic record corrected by hypoglycemic preparations and insulin. Some investigations established a connection between insulin resistance and the low level of HDL-c [18]. The HDL-c concentration increases under insulin therapy [21] and weight reduction [3,13]. According to M. Laakso et al. (1988), the HDL-c reduction is of great importance for CHD morbidity and mortality prognosis in patients with NIDDM. The HDL-c reduction down to 0,9 mmol/l and less was accompanied by the fourfold risk of CHD death.

A number of investigations [10,17,22] showed that hypercholesterolemia, stipulated by the increased level of LDL-c, is revealed in 54-77% of patients. Correction of glycemia is accompanied by the reduction of TC and LDL-c level [27]. Multiple Risk Factor Intervention Trial (MRFIT) [24] established the interconnection between TC and heart mortality of patients with DM. The obtained results showed that the higher cholesterol level in diabetic patients caused the higher risk of heart death. However, the same cholesterol level caused the higher (3-4 times) CHD mortality in patients with DM as compared to patients without it. The analysis of not numerous literature showed that there are still no any optimum approaches to lipid disorders treatment under DM. Moreover, dyslipidemia in diabetic patients are not practically corrected at present, that is mainly stipulated by high prices for known drugs.

Objective: This study sought to evaluate the dynamics of lipid metabolism in blood plasma and clinical efficiency of combined laser therapy (CLT) in patients with IDDM and NIDDM.

Materials and Methods

Within the last 2 years in conditions of out-patient department we observed 205 patients with NIDDM and 54 – with IDDM. The lipidnormalizing effect of CLT in combination with antioxidant therapy (aevit 600 mg a day) we have studied in 60 individuals with NIDDM (8 men and 52 women), mean age - $57,3 \pm 3,2$ years, with the level of fasting glycemia no more than 9,0 mmol/l, HbA1c – $7,3 \pm 0,19$ and $7,27 \pm 0,23\%$. The other 29 patients (with NIDDM) constituted the control group and have been treated only by sugar-reducing medications. In all patients we conducted lipid profile investigation. We also controlled glycemia, enzymatic blood activity (ALT, AST), clinical manifestations of angiopathy and performed the conjunctival biomicroscopy. All

examinations have been done prior to treatment, in 2 weeks (i.e. immediately after the treatment), in 8 days, 1, 4 and 9 months after the treatment.

Hypolipidemic action of CLT has been evaluated by the dynamics of TC, TG, LDL-C, HDL-C and atherogenicity rate (AR). Lipid profile has been investigated in venous blood serum taken in the morning hours after 12-14 hours fasting. For trials we used biochemical analyser. TC - by Enzyme methods (CHOD-PAP), TG - UV enzyme method, HDL-c - after VLDL-c and LDL-c sedimentation by heparin in magnesium ions presence. VLDL-c and LDL-c we determined by W. Friedwald: $VLDL-c = TG/5$, $LDL-c = TC - (HDL-c + VLDL-c)$. AR has been calculated by A.N. Klimov: $AR = TC - HDLc/HDL-c$. The conjunctival biomicroscopy has been conducted with the help of photoobservation slot lamp. Different parameters of microcirculation (vascular convolution, blood flow speed, arteriovenular interrelations, red blood cell aggregation, etc.) have been assessed. We performed a staged course treatment within 9 months. Repeated courses were given in 3 and 6 months. Each course consisted of 8-10 sessions of intravenous laser blood irradiation (ILBI) by red spectrum laser, $\lambda = 0,63$ mm, capacity at the light-guide end - 2 mW, exposure - 15-30 min. Simultaneously we conducted a percutaneous procedure by low intensive laser irradiation (LILI) in the near infrared spectrum, $\lambda = 0,89$ mm, capacity at the light-guide end - 5 - 20 mW in combination with magnetic nozzles on gastrocnemius muscle, liver, pancreas, spleen projections - frequency 150 Hz, exposure 4 min. on each zone.

Results

29 patients of the control group showed no obvious deviations of blood plasma lipids after 10-days intake of aevit (table 1). This conformity has been also registered under the subsequent courses of antioxidant therapy by aevit in 3 and 6 months.

In the main group of patients (table 2) TC level prior to treatment averaged to $8,2 \pm 0,31$ mmol/l, TG - $2,14 \pm 0,08$ mmol/l, LDL-c - $7,87 \pm 0,30$ mmol/l, HDL-c - $0,99 \pm 0,04$ mmol/l. AR made up $7,28 \pm 0,28$, LDL/HDL-c ratio - $7,94 \pm 0,30$ (with current standard being $< 5,0$).

Immediately after the conducted therapy no significant deviations of lipid profile have been seen. The level of TC slightly decreased to $7,98 \pm 0,31$ ($p < 0,01$). The level of TG even slightly increased until $2,51 \pm 0,09$ ($p < 0,01$). In a part of patients the normalization of the examined parameters was accompanied by a temporary elevation

of LDL-c from $7,87 \pm 0,30$ to $7,9 \pm 0,30$ ($p < 0,05$), that was probably connected with the intensified biosynthesis of lipids, resulting from the improved metabolism in liver. At the same time HDL-c concentration increased from $0,99 \pm 0,04$ to $1,14 \pm 0,04$ ($p < 0,05$). AR decreased from $7,28 \pm 0,28$ to $6,00 \pm 0,23$ ($p < 0,05$), respectively. LDL/HDL-c ratio made up $6,92 \pm 0,27$ ($p < 0,05$).

Hypolipidemic action of CLT has been distinctively revealed in 1 month after the performed treatment with the efficient reduction of TC level from $7,98 \pm 0,31$ to $5,31 \pm 0,20$ ($\delta < 0,01$). The tendency to the reduction of TG from $2,51 \pm 0,09$ to $1,69 \pm 0,06$ ($p < 0,01$) and elevation of HDL-c from $1,14 \pm 0,04$ to $1,42 \pm 0,05$ ($p < 0,01$) has been registered. The level of LDL-c decreased from $7,90 \pm 0,30$ to $6,63 \pm 0,25$ ($\delta < 0,05$). AR lowered from $6,00 \pm 0,23$ to $2,73 \pm 0,10$ ($\delta < 0,01$). The LDL/HDL-c ratio decreased from $6,92 \pm 0,27$ to $4,66 \pm 0,18$ ($p < 0,01$).

In 9 months the level of TC made up $6,01 \pm 0,23$ ($p < 0,01$), TG – $1,62 \pm 0,06$ ($p < 0,01$), LDL-c – $5,82 \pm 0,22$ ($p < 0,01$), HDL-c – $1,39 \pm 0,05$ ($p < 0,01$), AR – $3,30 \pm 0,13$ ($p < 0,001$), LDL/HDL-c – $4,18 \pm 0,16$ ($p < 0,01$).

Within the whole staged treatment blood plasma lipids in patients of the control group remained practically unchanged.

We also established positive deviations in clinical picture. It manifested in dynamics of general clinical diabetic symptoms, diabetic macropathy of lower limbs under the following scale: pain - sensitiveness to cold - walking, conjunctival biomicroscopy changes. The state of patients, suffering from IDDM and NIDDM complicated by diabetic angiopathy of pelvic limbs, improved in the main group after 2-3 sessions of CLT. Patients showed decrease or disappearance of pain, cramps and paresthesia, "getting warmer" of limbs. No dynamics of clinical picture in the control group have been revealed. By the end of treatment, symptoms of diabetic encephalopathy and asthenia disappeared in all patients. Mood and sleep also improved.

By the end of treatment fasting glycemia in NIDDM patients decreased from $14,21 \pm 0,85$ to $11,27 \pm 0,67$. In 3 weeks the level of glycemia in this group of patients decreased at most until $6,01 \pm 0,35$. Fasting glycemia in IDDM patients even increased from $10,46 \pm 1,46$ to $11,82 \pm 1,65$. And only after the third week it reduced to $7,45 \pm 1,04$. Thus, the distinctive positive effect in respect of carbohydrate metabolism has been reached.

Consequently, dosages of insulin and sugarcorrecting medications have been considerably lowered. The results of ophthalmologic investigation demonstrated the

improved retinal blood circulation in the greater part of patients of the main group with diabetic retinopathy. It has been expressed in the normalization of arteriolar/venular ratio, reduction of plasma leakage, resorption of microvascular hemorrhages and retinal edema, improvement of retinal trophism. Under the influence of CLT the blood flow speed in retinal vessels increased by 35-38%, red blood cell aggregation lowered 1,3-1,4 times. Patients of the control group did not show any improvement of retinal blood circulation.

Thus, our experience of the ambulatory application of laser therapy demonstrated the distinct effect in respect of lipid profile normalization. No side effects and complications have been registered.

Conclusions

It is safe to say that:

1. Combined laser therapy enables to avoid the intake of hypolipidemic and lipotropic agents, as in the result of treatment we observed the prolonged effect in respect of the most important, pathogenetically significant deviations of lipid metabolism: a true increase of HDL-c in the nearest catamnesis (which preserves up to 6-10 months) and decrease of LDL-c. Simultaneously we registered a true lowering of TC, TG to the norm or its upper limits. AR reduced more than 3 times and the LDL/HDL-c ratio - twice.
2. The application of a staged CLT in treatment of patients with IDDM and NIDDM enables to obtain a distinct, long-term, positive effect in respect of carbohydrate metabolism, simultaneously reducing insulin and sugar correcting medications dosage. It also results in microcirculation improvement.

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