The Use of Autotransfusion of Laser-Irradiated Blood in Treatment of Patients with Essential Hypertension

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The paper presents a discussion on therapeutic results obtained with autotransfusion of laser-irridiated blood in 66 patients with stage II essential hypertension. Forty nine comparable patients entered a control group of conventional treatment. The test and control patients with stage II hypertension were examined for time course changes in T- and B-lymphocytes counts, the activity of the energetic enzymes (alpha-glycerophosphate dehydrogenase, succinic dehydrogenase, lactate dehydrogenase), serum immuno-globulins and circulating immune complex levels. It was established that the standart antihypertensive treatment foiled to restore normal parameters of immunity and to favor positive alterations in the activity of the enzymes in the blood lymphocytes, whereas autotransfusion of laser-irradiated blood was found to stimulate immunity, especially cellular one. This occured in line with rise in the levels of lymphocytic dehydrogenases.

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At the latest years in the clinical practice the great attention was given to unmedicamental methods of treatment. Among latters the different forms of extracorporeal therapy (hemosorption, plasmapheresis, lymphosorption) were well proved themselves.

At the last years the indications for carrying out of autotransfusion of laser-irridiated blood (ALIB) were appeared in the complex treatment of patients with coronary heart diseases and atherosclerosis (1-3). There exists some information about successful use of ALIB in the treatment of arterial hypertension. At the present time a question about pathogenesis role of the immune system by essential hypertension (EH) [4] is discussed. Our investigation have revealed the violate of the system of the immunity of patients with the EH, in particularity, the change of the correlation of the immunocompetent cells with predominance of the poorly differentiated forms of lymphocytes, disimmunoglobulinemia and increase of level of the circulating immune complex (CIC) [5]. These changes correlate with satege of disease.

The influence of the ALIB on the humoral and the cellular links of the immunity have remained insufficiently study. According to the opinions of some authors [6,7] a rise of the dehydrogenosis activity is the sertification of the functional full value of the lymphocytes and their ability for execution of the specific functions of lymphoid cells including that of synthesis of the antibodies.

We used the ALIB as a method of immunocorrection in the treatment of patients with EH.

The aim of our investigation has been a study of quantitative maintenance of the immunocompatent cells and changing of activity of their energetic enzymes of patients with EH, which were treated by ALIB.

The 115 patients with EH of stage II were under observation. The diagnosis was established after several clinical investigations on the ground of generally accepted criterias of stages of EH which were suggested by WHO in 1978. All patients were divided into 2 groups. The control datas included 49 patients in age from 29 to 58 who received only medicamental therapy:

catapres, β-blockers, diuretics in the form of monotherapy or in combinations; the doses were selected individually.

The second group was included 66 patients of age from 35 till 55 which were carried ALIB. The majority of patients of the second group a week before ALIB was transfored on mono-therapy by catapres; further, after procedures ALIB the background therapy wasn't changed.

The indication for using of ALIB was the high arterial pressure (AP) stable to medicamental therapy, an acute form of dependence of the patients from hypertensive prepartions, untrans-feration of the latters.

ALIB was conducted according to worked out method by us with of apparatus LG-79-1 at speed of 10-20 millilitre per minute. The blood were taken from cubital vein from calculation 1-2 mililitre per kilogramme of the masses of patients body.

The duration of the procedure of irradiation was 10-15 minutes with laser irradiation rate 17.0 milliwatt. The blood was irradiated twice for this time: in the time of take away without anticoagulant and in the time of reinfusion with anticoagulant passing through tube of system for blood transfusion PK-11-01 in the zone of irradiation. The patients received from 4 to 7 procedures at a 1-2 day interval.

The initial level of AP before PP average formed 190.5 mmHg for systolic pressure and 115.5 diastolic one. After monodivisible pro-cedure was marked the lowering of systolic AP average on 20-30 mmHg, diastolic one-on 10-20 mmHg.

During the procedure at some patients was observed lowering AP on 50% from initial one. There were not the complications during con-duction of ALIB after treatment. The hypo-tensive effect was preserved more than 3 weeks at 6 patients. At 10 patients had tendency to increase after finishing of the treatment, but 17 didn't reach initial high level. That become indication for conduction repeated treated of ALIB (from 4 to 7).

The procedure was endure well by patient. Clinical improvement was marked at all patients (decrease of headache and dizziness, disappearance of pains in heart region). After treatment by ALIB most of patients were sucess to low a dose of catapres approximately 2 times as compared with initial one.

After discharge from hospital the positive clinical effect was observed during 5-6 months. One patient had a development of hypertensive crises in a month after discharge, but contra-distinction to preceeding ones, it was in easy from (it wasn't accompanied by shiver, vomiting quickly was stopped after additional dose of catapres). Immunological investigation was conducted to all patients There was determined the maintenance of T-lymphocytes by method of spontaneous rosette-formation by Jondal, B-lymphocytes by method immune rosette-formation by AN Cheredeev in modification of BV Pinegin, immunoglobulins (Ig) A, M, G by Manchini, CIC by Gashkova and co-authors in black blood.

The activity of the energetic enzymes (alphaglycerophosphate dehydrogenas (a-GD), succinic dehydrogenase (SD), Lactate dehydro-genase (D) were determined in the lymphocytes of peripheral blood by Narcisov (1969).

Apparently from Table 1 there is an observation of lowering absolut and percentage quantity of T-cells as compared with indexes of the control group the patients with the stage II of EH; the maintenance of B-lymphocytes is also drop and moreover absolut quantity is considerable extent.

There were not revealed the changes of quan-titative maintenance of T-lymphocytes on the background of traditional therapy, there was marked the moderate of absolute members of B-lymphocytes.

Table 1. Changes in the lymphocytes counts and the activity of the nergetic enzymes in patients of the 1st group (M≅m)

Index	Control (n=20)	The patients: Before treatment (n=49)	The patients: After treatment (n=49)	p
T-lymphocytes, %	70.0±3.4	53.9±0.92	56.0±0.83	<0.1
B- lymphocytes, %	8.8±0.4	8.3±0.26	9.2±0.26	<0.02
a-GD	9.47±0.27	9.84±0.27	10.4±0.43	>0.05
SD	14.3±0.76	14.2±0.77	15.7±1.12	>0.05
LD	15.5±0.83	15.7±0.62	13.9±1.54	>0.05

Table 2. Changes in the lymphocytes counts and the activity of the nergetic enzymes in patients of the 2nd group (M≅m)

Index	Control (n=20)	The patients: Before treatment (n=66)	The patients: After treatment (n=66)	p
T-lymphocytes, %	70.0±3.4	52.8±0.89	67.1±0.81	<0.01
B- lymphocytes, %	8.8±0.4	8.2±0.18	8.6±0.21	>0.01
a-GD	9.47±0.27	9.2±0.31	11.0±0.33	<0.01
SD	14.3±0.76	12.7±0.93	17.5±0.68	<0.05
LD	15.5±0.83	13.8±1.15	17.0±1.21	<0.05

It wasn't founded the essential changes from the patients with EH by analysis of the activity of dehydrogenases in comparison with control group. There wasn't marked the change of their activity after course of medicamental treatment.

There observed of distinct stimulation of T-cells link of immunity on the background of ALIB (Table 2) in the first 2 week. It is possible to mark that patients with initial low maintenance of T-lymphocytes had increase of latters in 1.5-2 times, but patients with morerally drop indexes of T-cells had their normalization.

There was also marked reliable increase of absolute number of B-lymphocytes from all patients in comparation with initial one, but there wasn't marked complete normalization. There observed the reliable increase activity of all investigated enzymes after ALIB, especially in the first week. During the comparison the number of immunocompetent cells and their dehydrogenases activity from one of them and from the same patients was revealed their prallel increase under the influence of ALIB. It is confirm with facts of others authors about activation of the blood cells of patients and donors under the action of ALIB.

The average indexes of Ig after ALIB didn't change, thought it was marked the tendency to their lowering: IgA-from 2.31 ± 0.09 mg/ml to 1.76 ± 0.07 mg/ml ($p < 0.01$), IgG-from 14.1 ± 0.67 mg/ml to 9.9 ± 0.31 mg/ml ($p < 0.01$), IgM-from 1.16 ± 0.03 mg/ml to 1.17 ± 0.04 mg/ml ($p > 0.1$).

At 19 from 66 patients with initial high level of CIC had it distinct lowering after procedure, at the rest of patients with the normal level of CIC it wasn't revealed it's lowering. by this way be dynamics of indexes of immunity of the patients with EH after conducted of ALIB allowed to consider, that this method exert stimulation immunocorrection influence.

It is especially important as on use of traditional therapy without of inclusion ALIB didn't occur the normalization indexes of immune system. Therefore the ALIB is possible to consider perspective method of unmedicamental therapy of patients with EH leading not only to lowering AP but and to normalization immune status of organism.

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