

Comparative study of the effect of acupuncture and the combined use of
homeopathic medicines and bioresonance therapy on protein synthesis in
blood lymphocytes

B.I. Islamov¹, A.A. Karpeev², E.B. Sanay¹, M.Yu. Gotovsky³, S. B. Kazibekova, V.A.
Lb¹

(¹Institute of Theoretical and Experimental Biophysics RAS, Pushchino,
Moscow Region, ²Federal Scientific Clinical Experimental Center
traditional methods of diagnostics and treatment of Roszdrav, Moscow, ³Centre
intelligent medical systems "IMEDIS", Moscow)

SUMMARY

The effect of acupuncture (AT), homeopathic preparations and bioresonance therapy (BRT), when used together, on the synthesis of proteins synthesized de novo in blood lymphocytes, and the relationship of the therapeutic effect of these methods of therapy with the induction of stress proteins in the cells of the body, was studied. The research results showed that BRT in combination with homeopathic medicines and acupuncture lead to the restoration of the synthesis of stress proteins both constitutively and in response to stress, while the synthesis of ordinary, constitutive proteins is normalized, which maintains a high level of expression even in the post-stress state. Against the background of these changes in the functional activity of lymphocytes in patients as a result of BRT and AT, the clinical picture of the disease significantly improves.

The success of therapy often depends on an effective combination of different therapies. In recent years, methods of energy-informational therapy such as bioresonance therapy (BRT) and homeopathy have become especially popular. They tend to work well together and are used by many clinical practitioners together. This is evidenced by international conferences held annually for 14 years [1]. However, the mechanisms of the therapeutic effectiveness of these methods have been little studied. This is especially true for homeopathic medicines.

G. Koehler, quoting F. Bacon, writes: "The medicine causes an artificial disease. Like any foreign substance, it acts as a specific irritant. Its healing effect is due to the reaction of the body. The reaction depends on the initial state of the organism, a slight irritation gives a stimulating effect due to the subsequent reactive response of the organism [2].

The ability of organisms to withstand adverse environmental influences is an inevitable result of evolution. In addition to various specific methods of protection, cells have rather general mechanisms of response to external and internal damaging influences, a characteristic feature of which is the rapid synthesis of the so-called heat shock proteins (HSPs) or stress proteins [3, 4, 5]. Induction of stress proteins is often

is associated with an increase in cell tolerance to both the inducing agent and other stressors [6].

The aim of this study was to study the effect of acupuncture, homeopathic medicines and BRT when used together for the synthesis of proteins synthesized de novo in blood lymphocytes, and checking the connection of the therapeutic effect with induction of stress proteins in the cells of the body.

Materials and methods

The study involved 59 patients (the overwhelming majority of women), of whom 30 with rheumatoid arthritis (13 - at the age (B) 32 ± 4 years, the duration of the disease (P) 2–5 years, the degree of activity (A) I– II, at the stage of rheumatoid process (C) I – II, functional insufficiency (FN) I – II; 17 - B = 45 ± 12 years, P = 5-15 years, A = II-III, C = II-III, FN = II), insulin-dependent diabetes - 4 (H = 38 ± 10 years, P = 4-7 years), persistent headaches (migraine) - 3 (B = 36 ± 7 years, P = 2-4 years), osteochondrosis various parts of the spine - 10 (H = 35 ± 12 years, P = 3-10 years), atopic bronchial asthma - 3 (H = 35 ± 3 years, P = 2-5 years), gastric ulcer - 6 (B = 39 ± 9 years, P = 5-10 years). The control group consisted of practically healthy people (10) of the same age group. The BRT course on the IMEDIS-BRT-A apparatus (IMEDIS Center, Moscow) included 10-15 sessions (2 sessions per week) of 30 min therapy in the endogenous BRT mode. In the intervals between the sessions, the patients took homeopathic medicines individually selected using the Imedis-test autonomic resonance test (ART) [7]. For comparability of results, BRT tactics were standardized as much as possible. All treatment sessions were carried out in the morning. Each time at the beginning of therapy, disharmonic oscillations were recorded for 2–3 seconds. in the "sequentially along all meridians" mode. Then the therapy time for each meridian was set to 0.62 sec. with a pause of 0.38 sec. The duration of the session is 30–40 sec. Foot and hand electrodes were used. Frontal electrodes were placed at the site of pain localization. Acupuncture procedures were performed in total for 14 days (10 sessions). Acupuncture needles were introduced according to individual recipes for each patient.

Blood samples were taken from the cubital vein before and one day after completion of the BRT course. A fraction of mononuclear cells (hereinafter referred to as lymphocytes) was obtained from the blood on a ficoll-verographin gradient ($p = 1.077$) according to [8]. Cell death at all stages of isolation and cultivation, according to trypan blue staining of the cell suspension, was no more than 3%. The synthesis of proteins by lymphocytes was investigated by densitometry of radio autographs of the polypeptide composition of the cell lysate after their cultivation. *in vitro* in the environment RPMI 1640 with appendix 10

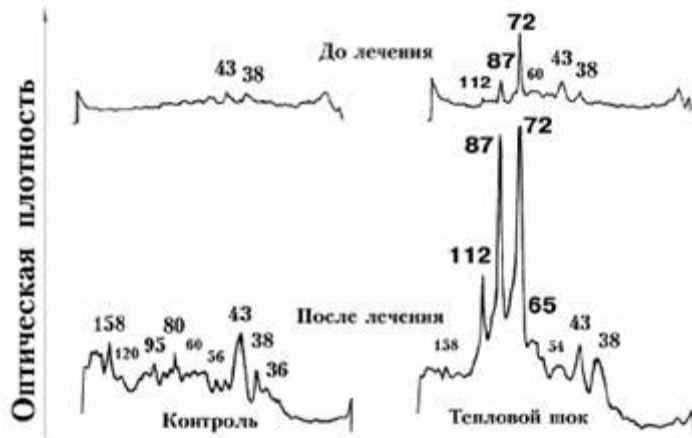
$\mu\text{Ci} / 3 \times 10^6$ cl. 35S-merionine for 3 hours 15 minutes. at 37°C (control) and for 15 min. at 44°C and then 3 hours at 37°C (induction of HSP synthesis by heat shock, HS).

Separation of the polypeptide composition of newly synthesized proteins in lymphocytes was performed by one-dimensional PAGE electrophoresis in the presence of sodium dodecyl sulfate for quantitative and two-dimensional PAGE electrophoresis

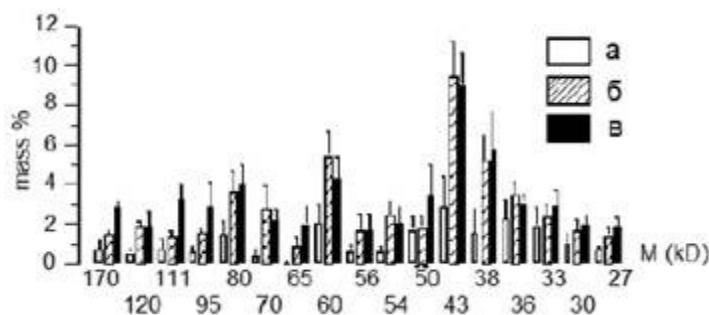
for visual assessment according to [9]. Statistical analysis was performed using Fisher's test. As compared values, the ratio of the amount of newly synthesized protein labeled with ^{35}S -methionine (the area of the peak corresponding to the studied protein on the densitogram from the radio autograph) to the total protein content in the sample (the total area of the peaks of all proteins on the densitogram obtained by scanning the same protein sample stained with Coomassie R250).

Results and its discussion

The research results are presented in Figures 1-5. It was found that in patients with rheumatoid arthritis, compared with healthy people, the ability of lymphocytes to synthesize heat shock proteins and other cellular proteins is suppressed, the degree of depression depends on the severity and duration of the disease. The II – III degrees of RA activity and duration of 5–8 years are characterized by extremely weak protein synthesis at physiological temperature, weak induction of HSPs of 70 and 65 kDa, and inhibition of the synthesis of constitutive proteins in response to HS (Fig. 1). A statistically significant decrease in the synthesis of the entire spectrum of the studied proteins was found in blood lymphocytes in all patients before treatment ($p < 0.001$) ($p < 0.001$), compared with lymphocytes taken from conventionally healthy people (Fig. 2).



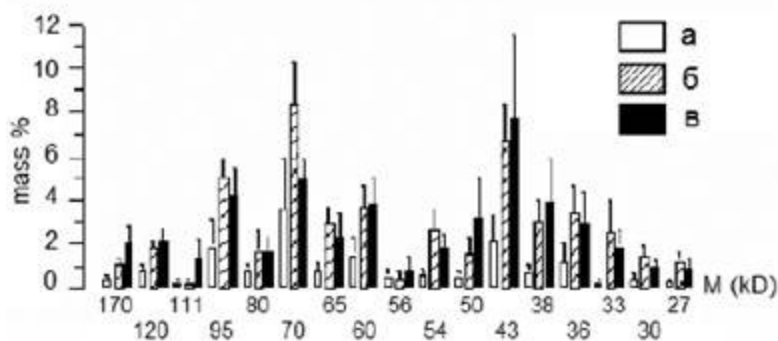
Rice. 1. Densitograms of the polypeptide composition of proteins synthesized de novo in blood mononuclear cells of a patient with grade II-III RA.



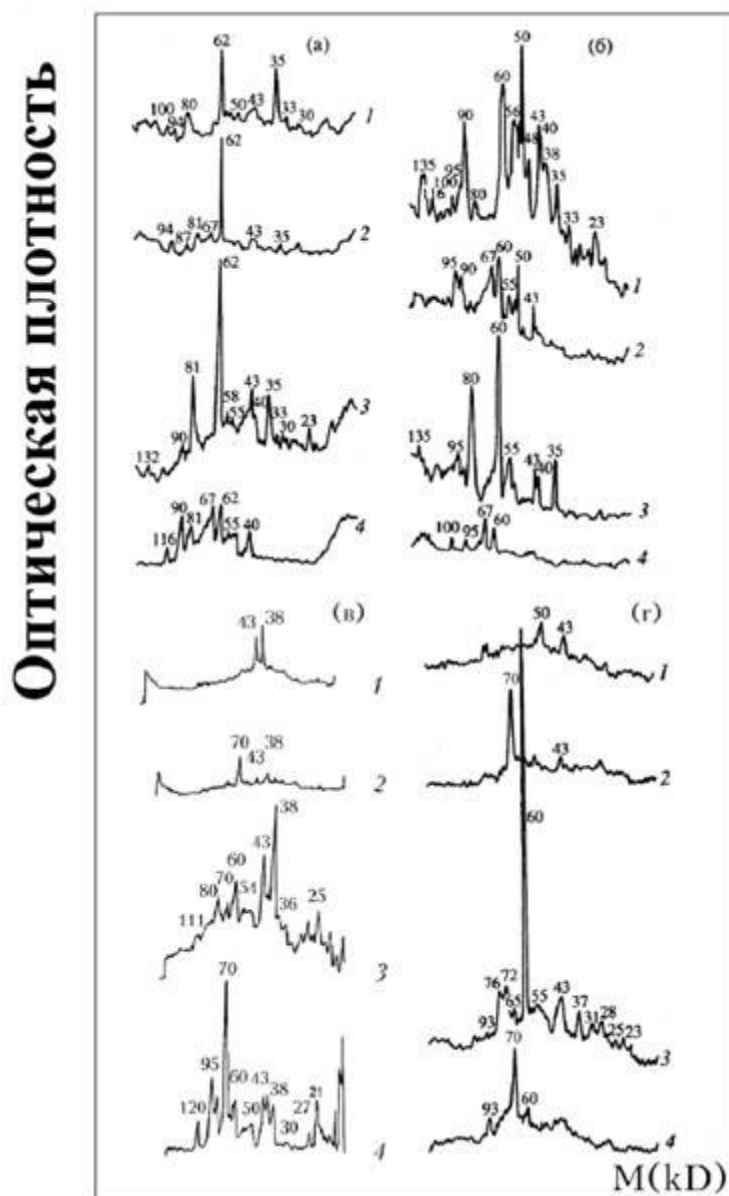
Rice. 2. Synthesis of proteins at rest in blood lymphocytes of patients with RA before and after a course of treatment for relatively healthy people (a - before, b - after treatment, c - conditionally healthy).

Heat shock enhances the suppression of the synthesis of constitutive proteins, although it is reliably, but weakly expressed, typical heat shock proteins are induced. If we compare with conditionally healthy, we see a significantly suppressed synthesis of the entire spectrum of proteins both before and after heat shock. Depending on the initial severity of the pathology, a different degree of inhibition of protein synthesis in blood lymphocytes was observed. In patients with a long duration of the disease, practically no protein synthesis was recorded in the conditions of our studies, and even a reaction in response to heat shock was not observed.

After therapy, protein synthesis reaches normal levels, with the exception of some proteins with molecular weights of 111, 95, and 50 kDa. It is noteworthy that after treatment, the expression of typical stress proteins in response to heat shock is increased in comparison with conventionally healthy people (Fig. 3).



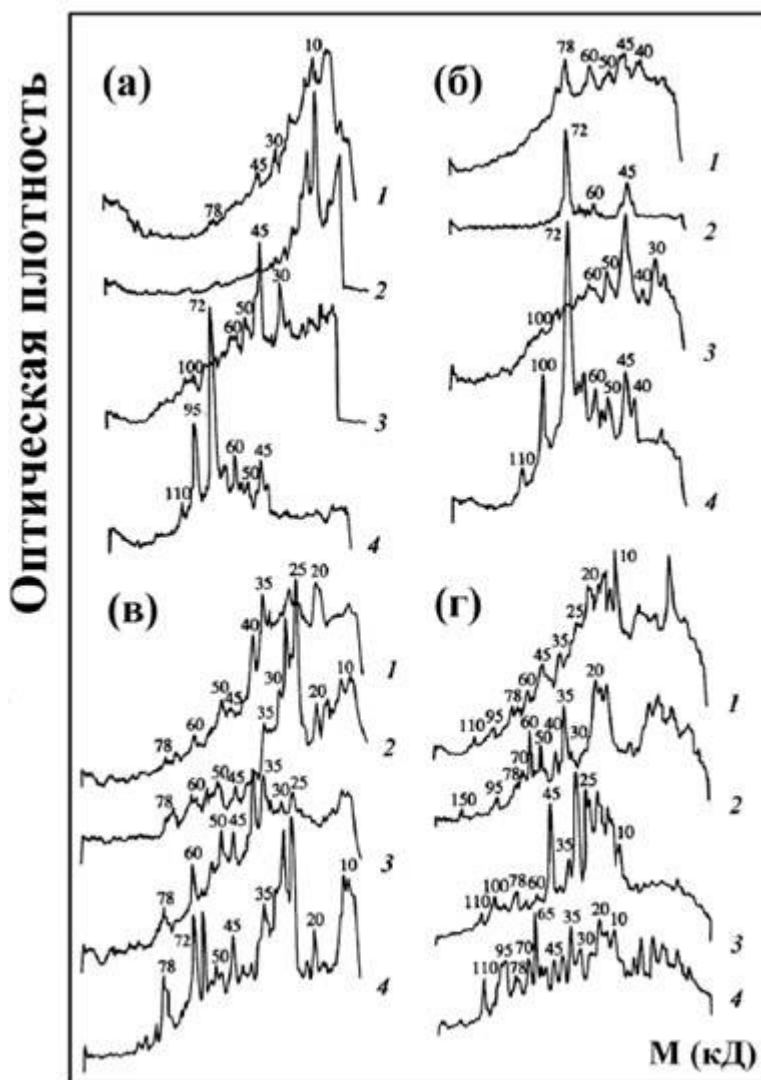
Rice. 3. Protein synthesis in response to heat shock in blood lymphocytes of RA patients before and after a course of therapy for relatively healthy people (a - before, b - after treatment, c - conditionally healthy).



Rice. 4. Densitograms of autoradiographic study of polypeptide the composition of proteins synthesized de novo in blood lymphocytes of patients with peptic ulcer stomach disease (a), bronchial asthma (b), diabetes mellitus (c) and osteochondrosis of the thoracic spine (d) before (1 - before and 2 - after HS) and after (3 - before and 4 - after TS) BRT course.

In patients with pathologies accompanied by prolonged pain of various localization, such as stomach ulcer, migraine, osteochondrosis, a similar picture was found. For example, in patients suffering from persistent headaches (migraine), initially there is a low baseline level of the synthesis of constitutive proteins, which is almost completely inhibited in response to HSP, while there is no induction of HSP synthesis (Fig.5a). In fig. 5a shows the initially meager spectrum of proteins synthesized in resting lymphocytes of a patient with gastric ulcer,

accompanied by severe pain. Heat shock induces a cellular response in the form of a weak induction of the synthesis of 70 kD HSPs against the background of inhibition of the synthesis of other cellular proteins. A similar picture is observed in patients with muscle pain caused by osteochondrosis of the spine (Fig. 4d). Noteworthy is the absence of such a situation in patients with attacks of bronchial asthma. As you know, this pathology is associated with the hyperreactivity of the immune system to allergens of various origins. So, for example, a young woman (30 years old) with a mild severity of this disease initially has a high level of synthesis of constitutive proteins, which practically do not differ in their spectrum from proteins synthesized by resting lymphocytes of healthy people. HS leads only to a slight inhibition of the synthesis of constitutive proteins with a molecular weight of 135, 43 (actin) and 38 kDa; the level of synthesis of other proteins synthesized by lymphocytes at physiological temperature remains high. However, in response to HS from the classical set of HSPs (120, 95, 70, 65 kDa, etc.), only the synthesis of proteins corresponding to the molecular weight of HSP 95 kDa is induced. (Fig.4b).



Rice. 5. Densitograms of autoradiographic study of polypeptide

the composition of proteins synthesized de novo in blood lymphocytes of patients with migraine (a), osteochondrosis of the thoracic spine of moderate severity (b), RA (c), and gastric ulcer (d) before (1 - before and 2 - after HS) and after (3 - before and 4 - after TSh) acupuncture course.

To clarify the specificity of the effect of BRT on the ability of lymphocytes in RA to synthesize proteins in vitro, we investigated the change in protein synthesis in lymphocytes after BRT in other diseases. In fig. 5 shows densitograms of patients with gastric ulcer (Fig. 5a) and osteochondrosis of the thoracic spine (Fig. 5d) before and after BRT. It can be seen that the course of BRT leads to an almost complete restoration of the level of protein synthesis, characteristic of the lymphocytes of healthy people. Nevertheless, in response to HS, 3 hours of subsequent incubation after HS at physiological temperature is not enough to restore the synthesis of constitutive proteins, and induction of HSP synthesis corresponded to the quantitative and qualitative composition of HSP in the control group.

In patients with insulin-dependent diabetes, BRT brings protein synthesis in lymphocytes to a level characteristic of the lymphocytes of healthy people at rest, and in response to HS, the induction of synthesis of the classical set of stress proteins of 87, 70, 65 kD is observed, while the inhibition of the synthesis of constitutive proteins is insignificant (Fig. 4c). Similar changes in protein synthesis during BRT are recorded in osteochondrosis of the spine (Fig. 4d).

We found that acupuncture therapy, regardless of the nosological unit, leads to an increase in the ability of lymphocytes to synthesize proteins both at physiological temperature and to induce HSP synthesis in response to heat shock. In fig. 5c shows the initially meager spectrum of HSPs synthesized in the lymphocytes of a patient with RA. After 10 sessions of AT, in response to HS, the synthesis of proteins with molecular weights of 87, 70, 58, 45 kDa is significantly increased and the spectrum of synthesized proteins expands. In fig. 5d presents the results of studies of protein synthesis in lymphocytes of a patient with gastric ulcer. After a course of acupuncture, in response to heat shock, there is an increase in the synthesis of proteins with molecular weights of 110, 95, 70 and 60 kDa.

In the case of lymphocytes isolated from the blood of a patient suffering from migraine, acupuncture therapy promotes the expansion of the spectrum of synthesized proteins and changes in its qualitative and quantitative characteristics both at physiological temperature and in response to HS (Fig.5a). Especially sharp shifts are observed after TS. There is an increase in the expression of proteins with molecular weights of 120, 95, 72, and 65 kDa due to the induction of the synthesis of the corresponding HSPs.

A similar quantitative and qualitative expansion of the spectrum of synthesized proteins after acupuncture therapy is observed for lymphocytes from patients with osteochondrosis (Fig. 5b). As a result of the performed acupuncture therapy, these changes in the synthesis of lymphocyte proteins were accompanied in most cases by noticeable improvements in the health status of patients, which we assessed as

subjectively (according to the patients) and objectively, according to the indications of the electrical conductivity of the BAP. Thus, we have obtained data indicating the possibility of stimulating the ability of lymphocytes to synthesize HSP by BRT and acupuncture in RA, insulin-dependent diabetes and pathologies with severe pain syndrome. These methods of therapy lead to the restoration of the synthesis of stress proteins, both constitutively and in response to stress, while the synthesis of ordinary, constitutive proteins is normalized, which retains a high level of expression even in the post-stress state. Against the background of these changes in the functional activity of lymphocytes in patients as a result of BRT and AT, the clinical picture of the disease significantly improves.

Thus, the studies carried out show that acupuncture in combination with homeopathic remedies and BRT has an effect on the body similar to adaptive stress, which induces the induction of stress proteins and activates nonspecific protective reactions of the body.

conclusions

1. It has been shown that in RA and a number of other diseases (insulin-dependent diabetes, gastric ulcer, migraine, osteochondrosis of the spine) in the blood lymphocytes of patients, there is a depression of protein synthesis in general and HSP synthesis in response to stress in particular. Moreover, the degree of depression depends on the severity and duration of the disease.
2. The use of BRT or acupuncture in the treatment of RA and others of the above pathologies restores the ability of blood lymphocytes to synthesize HSP constitutively and in response to stress, while protein synthesis is normalized in general, both qualitatively and quantitatively.

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