тативної дисфункції та коронарної недостатності. Продовження занять антистресовою пластичною гімнастикою дозволяє утримувати досягнутий антигіпертензивний ефект протягом щонайменше 3 міс.

У пацієнтів з АГ II стадії зі СПЕН застосування запропонованого комплексу дозволяє знижувати навпіл дозу гіпотензивних препаратів на період проведення лікувальних заходів, при цьому досягаючи зниження АТ з вираженим позитивним клінічним ефектом, що відображається у зниженні частоти клінічних та ЕКГ-ознак. Втім гіпотензивній ефект у пацієнтів даної категорії був нестійким та не підтверджувався у віддалений період.

У пацієнтів з АГ III стадії зі СПЕН, що ускладнена серцевою недостатністю, при застосуванні магнітолазерної терапії не відзначено достовірного гіпотензивного ефекту, хоча дещо знизилась частота виявлення ЕКГ-ознак кардіальної патології.

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ENGLISH VERSION: POINT OF PSYCHOPHYSICAL REHABILITATION IN TREATMENT OF PATIENTS WITH STRESS ASSOCIATED HYPERTENSION*

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The efficiency of use of magnetolaser therapy and psychophysical correction in patients with arterial hypertension and syndrome of psychoemotional stress was studied. The application of the proposed complex of therapeutic interventions among patients with hypertension of the 1st stage allowed after 10 sessions to reduce to a minimum the dose of antihypertensive drugs with stable decrease of blood pressure. Continuation of anti-stress plastic gymnastics exercises, made it possible to preserve antihypertensive effect for at least 3 months. In patients with hypertension stage II, the application of the proposed complex allowed to reduce by half the dose of antihypertensive drugs during the treatment measures and showed a positive clinical effect.

Keywords: hypertension, rehabilitation, magnetolaser therapy, psycho-physical correction.

Hypertension (HT) is the most significant in its prevalence, complications and possible severe consequences disease in the world. In Ukraine, 29.6 - 36.3% of adults have high blood pressure (BP), and in older age groups AH is detected more than in 40% of cases [1]. According to modern concepts, chronic psychoemotional strain is considered as one of the etiological factors of increase of blood pressure and complex social and political conditions may be one of the reasons of growth of cardiovascular diseases in Ukraine. Increased blood pressure occurs with the participation of the central and peripheral nervous system at different levels. Activation of the sympathoadrenal system under the influence of emotional stress leads to increase in blood pressure, and the results of many studies suggest that exactly the degree and duration of stress activated nervous system, which in turn depends on many other factors (environmental conditions, genetic and constitutional predisposition, the individual characteristics of mental reaction, etc.), affecting the occurrence of hypertension [2, 3, 4, 8, 9, 11]. Treatment of hypertension with the background of psychoemotional tension syndrome (PETS) usually requires the use of a group of cardiac as well as psychotropic drugs, creating inconvenience for patients and limitations on activities of daily living, mutually reinforcing hepato-renal toxicity, allergy and severity of side effects [10]. All this leads to the search for new methods of therapeutic effects, including complex use of physical therapeutic factors, and one of the most studied in the treatment of

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hypertension is the magnetolaser therapy (MLT) [5, 6]. However, in the choice of optimal physical methods of treatment, special importance is the need of taking into account a complex set of physiological, pathophysiological and pathobiochemical changes in the hypertensive patients with PETS, because in this case the effectiveness of medication and physical therapy without psychocorrecting methods is not high enough. At the same time today for mind-body correction of PETS such methods as audio-visual stimulation (AVS) and anti-stress plastic hymnastics (ASPH) are widely used. Currently the effectiveness of light and sound modulation of bioelectric activity of brain using the AVS in depressive disorders astenoneurotic syndrome and post-stress disorders, has been proven making a promising application of AVS in hypertension, especially with PETS [12]. ASPH as a kinesitherapy method, combined with autogenic training proposed by A. Popkov [7] is aimed at expanding the adaptive human capabilities and ensuring its resistance to environmental influences and changes that occur in the body under the influence of stress factors. ASPH involves performance of muscle exercises in a weak isometric mode in which concomitant relaxation for the entire sessions creates optimal ratio between the central and peripheral circulation and are promising for use in patients with hypertension with PETS, but any scientific publications on this subject are absent.

Therefore, the relevance of the topic, taking into account the extensive development of hypertension in the adult population of Ukraine, interconnectedness and self- worsening of cardiovascular and neuropsychiatric components of pathogenesis, lack of effectiveness of protocol antihypertensive therapy in patients with PETS and potential effects of combined use of MLT and psychophysical correction as AVS and ASPH form cause the appropriateness of conducting of this study.

Objective: To improve the efficiency of restorative treatment of patients with hypertension using additional use MLT and psychophysical correction at the outpatient stage.

Materials and Methods of Study

The study included male patients from a group of dispensary examination of departmental medical institutions of the Ministry of Internal Affairs.

Group A (n = 66) included males whose average age was 35,67 ± 8,95 years, which had hypertension of the 1st degree (stage I) without complications.

Group B (n = 75) - males, average age was 48,33 ± 7,12 years, were diagnosed with hypertension of the 2nd-3rd degree (II stage) and angina pectoris functional class I (FC).

Group C (n = 35) - males, average age was 47,78 ± 8,54 years, were diagnosed with hypertension 2-3rd grade (II-III stage), FC II angina pectoris and heart failure (HF) I- II FC according to NYHA classification. The results were compared with data obtained by prophylactic examination of 143 healthy men of the corresponding age (control group). In the treatment of patients using magnetolaser therapy, which was performed on the device "MIT-11" (Ukraine) with the following parameters: wavelength - 0.86 microns, the output power of the laser radiation - 10 MW, induction of alternating magnetic field - 40 mT, repetition rate of the laser pulses radiation - 50 Hz in the occipital area for 5 minutes every day, duration of treatment - 20 procedures; audio-visual stimulation using the audio-visual player NovaPro-100 (Photosonix inc., USA) - program "Stress-killer" with frequency packages: 11 Hz - 10 minutes, 8 Hz - 15 min, 3 Hz - 10 minutes and 11 Hz - 10 minutes. Total duration - 45 minutes daily for the course - 20 procedures. ASPH consisted of a base set that includes physical exercises without stress on the muscles and joints in combination with basic thought images - pictures which promote relaxation, the sense of comfort and inner balance, eliminate tension and stiffness, simulating a state of relaxation and tranquility. Duration of procedures - 20 minutes in the evening (from 18:00 to 21:00), the course of treatment - 20 procedures. The total duration of the experimental treatment was 21 ± 1 day. The basic drug therapy was administered according to standard protocols according to the stage of hypertension and taking into account previous treatment. It included the use of ACE inhibitors, ARB, beta-blockers, diuretics and aspirin. All patients performed examinations in accordance with the study protocol - before, at the end of treatment and follow-up - 3 months after treatment. All received data were processed using modern methods of variation statistics using Microsoft Office Excel.

Results and discussion

As the results of the study, the main experimental group had received a clear positive result on the daily fluctuations in blood pressure (Table 1). Group A included 66 men with hypertension I stage without complications. In the study group A / I complex treatment included basic pharmacological treatment (enalapril 5 mg / day + bisoprolol 2.5 mg / day) + MLT segmentally on the projection of the medulla oblongata + AVS in the alpha range + ASPH. From the 10th session under condition of stable blood pressure antihypertensive treatment was withdrawn. Patients placebo group (A / II) treatment complex included basic pharmacological treatment + AVS in the alpha range + MLT with disabled outline. In the experimental group was selected subgroup A / III, which consisted of 10 patients receiving designed complex without ASPH. Obtained results indicate a pronounced effect of MLT in combination with AVS and kinesitherapy. The application of the proposed medical complex allowed after 10 sessions to reduce to a minimum the dose of antihypertensive drugs with a steady decline in systolic blood pressure to a maximum 127,21 ± 8,32 mm Hg., maximum diastolic blood pressure to 89,67 ± 8,44 mmHg. with a corresponding reduction in the incidence of symptoms of vegetative dysfunction and coronary insufficiency. Continuation of anti-stress plastic hymnastics exercises made it possible to preserve antihypertensive effect for at least 3 months.

Table 1

Dynamics of indicators of blood pressure in patients of group A

Indicator	Before treatment	After 10 days	After 20 days	After 3 months
Subgroup A/I (n=28)				
BPsys max	175,53±10,32	141,21±5,35*	127,21±8,32*	132,56±4,43*
BPsys min	135,32±6,21	124,62±4,11	119,83±4,56	124,54±5,33
BPdias max	121,15±7,21	103,43±7,12*	89,67±8,44	87,67±4,25*
BPdias min	86,34±8,56	76,43±5,21	72,67±7,43	78,57±7,32

Subgroup A/III (n=10)				
BPsys max	174,56±9,43	142,56±4,22*	129,67±5,32*	151,65±4,33
BPsys min	137,43±6,32	128,54±4,33	131,45±3,21	133,54±7,87
BPdias max	120,09±8,21	104,32±4,78	108,78±5,56	107,43±7,21
BPdias min	87,78±5,89	87,89±7,23	86,73±5,33	88,98±5,67
Subgroup A/II (n=28) – placebo				
BPsys max	176,43±8,47	163,53±4,23	159,43±6,33	163,74±4,98
BPsys min	140,09±5,32	131,54±3,21	129,89±4,22	135,67±3,22
BPdias max	118,67±6,23	108,56±8,23	110,07±5,33	109,78±5,32
BPdias min	88,54±5,32	86,88±5,32	83,56±5,21	86,52±4,62

*Note: * - credible difference with respect to parameters before treatment (p <0,005).*

The group B included 75 men with a diagnosis of essential hypertension stage II, heart failure I- II functional class, angina pectoris I- II FC. Basic pharmterapy included enalapril (5 mg), bisoprolol (5 mg) and acetylsalicylic acid (30 mg) daily. The group was divided into three subgroups according to treatment programs according to a patient in group A: B / I - pharmterapy + MLT + AVS + ASPH; B / II - pharmterapy + AVS + MLT placebo +APG; B / III - pharmterapy + MLT + AVS without kinesitherapy. Evaluation of the effectiveness of the treatment was carried out by three times daily indicators of measurement of blood pressure, the results of Holter monitoring and daily monitoring of blood pressure. As the results of the study, patients groups, which carried a full range of therapeutic measures had positive results in the daily fluctuations of blood pressure according to three times of a its measurement and monitoring. (Table 2).

Table 2
Dynamics of indicators of blood pressure in patients of group B

Indicator	Before treatment	After 10 days	After 20 days	After 3 months
Subgroup B/I (n=30)				
BPsys max	178,53±9,32	146,54±6,25*	147,21±4,52*	166,56±6,73
BPsys min	129,63±7,35	125,83±6,23	128,63±3,32	139,64±3,53
BPdias max	115,65±3,61	108,35±3,62	103,37±4,43*	104,62±5,45*
BPdias min	88,34±4,56	87,33±6,42	71,57±5,43*	88,53±6,62
Subgroup B/III (n=20)				
BPsys max	176,53±5,43	154,36±4,22*	139,57±6,61*	171,35±8,63
BPsys min	125,33±7,12	124,64±7,13	126,55±4,18	132,44±5,62
BPdias max	115,09±4,63	102,34±3,82*	105,54±3,54*	108,43±8,33
BPdias min	87,82±7,33	82,59±3,67	83,35±6,32	87,28±5,78
Subgroup B/II (n=25) – placebo				
BPsys max	173,48±5,43	167,42±4,23	158,43±6,33*	173,74±4,98
BPsys min	134,39±7,39	134,87±4,29	123,63±5,67	133,39±5,62
BPdias max	113,57±6,35	105,67±3,63	113,29±5,63	123,67±67,32
BPdias min	88,98±6,78	83,58±6,74	85,66±7,44	86,92±7,45

*Note: * - credible difference with respect to parameters before treatment (p <0,005).*

In patients with stage II hypertension and exertional angina hypotensive effect was obtained with MLT in combination with AVS and kinesitherapy after 20 sessions. In the first and second sub-groups after 10 days dose of enalapril was reduced to 2.5 mg, and in 20 days - bisoprolol (up to 2.5 mg). However, the effect was unstable and after 10 days the dose has been restored to the original. There was no sustained therapeutic outcome in patients depending on the performance of a ASPH complex. In patients of the placebo group significant reduction in blood pressure was not found over 10 sessions which required extension of designed pharmterapy. However, after treatment a significant reduction in SBP was shown, which is likely due to the effects of AVS and movement mode. However, this effect was not stable.

Group C patients were divided into two subgroups as ASPH was not used. In the subgroup of C / I was basic pharmacotherapy + MLT administered. Patients subgroup C / II received medications administered and MLT-placebo. AVS was not used because of the adverse effects in this group of patients. The results of the dynamic evaluation of patients of this group allow us to conclude that the clinical efficacy of MLT in this category of persons is not proven; the difference between the maximum and minimum systolic blood pressure and diastolic blood pressure in minimal subgroups, which used MLT and placebo, was virtually absent (Tab. 3).

Table 3
Dynamics of indicators of blood pressure in patients of group C

Indicator	Before treatment	After 10 days	After 20 days	After 3 months
Subgroup C/I (n=20)				
BPsys max	165,62±11,52	156,21±6,21	154,21±6,32	161,56±7,43
BPsys min	123,36±2,41	134,32±8,13	129,63±6,66	134,24±8,31
BPdias max	119,25±6,41	103,43±7,12	89,67±8,44*	105,67±4,25
BPdias min	62,38±6,26	72,73±6,17	72,18±3,13	78,97±5,26
Subgroup C/II (n=15)				
BPsys max	164,26±11,43	162,36±4,28	159,67±6,82	161,15±4,63
BPsys min	124,46±6,12	124,54±3,33	125,45±6,27	134,53±6,17
BPdias max	121,19±5,21	114,62±4,78	118,78±7,16	117,43±7,21
BPdias min	67,18±5,29	67,93±7,23	66,33±9,32	68,84±6,67

*Note: * - credible difference with respect to parameters before treatment (p <0,005).*

In the CI subgroup of patients revealed a significant reduction in maximum diastolic blood pressure after 20 days of treatment. Obviously, these results are explained by the fact that patients suffering from hypertension for quite a long period of time, there is a reorganization of regulatory mechanisms to decrease fluctuations of adaptive responses, establishing certain rhythm of neurovegetative-endocrine reactions that are fixed by morphofunctional changes in the cardiovascular system and related with it systems. Choosing the right drug therapy provides effective maintenance of state at level compensation-subcompensation. Therefore, the use of aggressive methods of physical therapy and physical rehabilitation in these patients is unnecessary.

Conclusions

In patients with hypertension stage I with PETS application of proposed medical complex allowed after 10 sessions reduce to a minimum the dose of antihypertensive drugs with a steady decline of maximum systolic blood pressure to 127,21 ± 8,32 mm Hg., maximum diastolic blood pressure to 89,67 ± 8,44 mmHg. with a corresponding reduction in the incidence of symptoms of vegetative dysfunction and coronary insufficiency. Continuation of anti-stress plastic hymnastics exercises allows to keep the achieved antihypertensive effect for at least 3 months.

In patients with hypertension stage II with PETS application of the proposed complex allows to cut by half the dose of antihypertensive drugs for the duration of therapeutic measures, thus achieving a reduction in blood pressure with marked positive clinical effect that appears in reducing the incidence of clinical and ECG signs. However hypotensive effect in patients of this category was unstable and not confirmed in the remote period.

In patients with hypertension stage III with PETS which is complicated by heart failure, during the application of magnetolaser therapy we observed significant hypotensive effect, although somewhat reduced incidence of ECG signs of cardiac disease.

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