

кишки у дітей без ППФР були поширеність незначних та безсимптомних форм (29,0%) з виявленням перших клінічних ознак захворювання у вигляді ускладнень (шлунково-кишкова кровотеча, рубцево-виразкова деформація дванадцятипалої кишки) (8,1%). Така ж картина спостерігалася і у дітей з ППФР, проте частота ускладнень у них була значно вищою (14,7%) при більшій тривалості (73,0%) та тяжкості (53,8%) захворювання порівняно з 46,6% та 16,7% у пацієнтів без ППФР. Основними комплексними психологічними маркерами розвитку ПСП у дітей з та без ППФР були високий рівень особистісної та реактивної тривожності, емоційна лабільність та відхилення від аутогенної норми, низькі показники самооцінки та низька працездатність, що вимагало диференційованої медико-психологічної підтримки.

Ключові слова: психосоматична патологія, психофізичні розлади, діти, підлітки, фактори ризику.

Стаття надійшла 15.05.2019 р.

дванадцятиперстної кишки у дітей без ПФНР являлись розпространеність малих і бессимптомних форм (29,0%) з виявленням перших клінічних ознак захворювання в формі ускладнень (желудочно-кишкові кровотечення, рубцево-язвенна деформація дванадцятиперстної кишки) (8,1%). Така ж картина наблюдалась у дітей з ПФНР, однак частота ускладнень у них була достовірно вище (14,7%) при більшій тривалості (73,0%) та тяжкості (53,8%) захворювання порівняно з 46,6% та 16,7% у пацієнтів без ПФНР. Ключевым комплексом психологических маркеров развития ПСП у дітей з і без ПФНР являлись високий рівень личної і реактивної тривоги, емоційна лабільність і відхилення від аутогенної норми, низькі показники самооцінки і погана успішність, що вимагало диференційованої медичної і психологічної підтримки.

Ключевые слова: психосоматическая патология, психофизические расстройства, дети, подростки, факторы риска.

Рецензент Знаменська Т.К.

DOI 10.26724/2079-8334-2020-1-71-13-18

UDC 616.12-008.331.1-053.81-005-073.432.19-085

O.M. Bilovol, I.I. Kniazkova, M.V. Bogun, R.V. Lutsenko¹
 Kharkiv National Medical University, Kharkiv
¹Ukrainian Medical Stomatological Academy, Poltava

TREATMENT OF ARTERIAL HYPERTENSION IN YOUNG MALES WITH CLINICAL SIGNS OF AUTONOMIC DYSFUNCTION

e-mail sskripka72@gmail.com

The aim of the study was to improve the effectiveness of the treatment of arterial hypertension (AH) in young patients with clinical signs of autonomic dysfunction. We examined 65 male patients with AH (mean age 35.6 ± 4.3 years) and clinical signs of autonomic dysfunction. Basic therapy was administered to 30 of them (group 1), and ethylmethylhydroxypyridine succinate (EMS) was additionally administered to 35 patients (group 2) for 4 weeks. After treatment, BP correction to target values was achieved in 76.7% of the patients in group 1 and in 88.6% in group 2. On the background of therapy with EMS, a more pronounced increase in total HRV, decreased activity of the sympathetic division of the autonomic nervous system and restoration of the vegetative balance according to the temporal HRV indicators, as well as the significant positive changes in state and trait anxiety were observed. Thus, the inclusion of EMS in the complex treatment of young males with AH and clinical signs of autonomic dysfunction has a positive effect on clinical symptoms, contributes to the restoration of the autonomic balance and correction of psycho-emotional state.

Key words: arterial hypertension in young, autonomic dysfunction, heart rate variability, anxiety, ethylmethylhydroxypyridine succinate.

The work is a fragment of the research project "Optimization of diagnosing and treatment of comorbid pathology (hypertension and type 2 diabetes mellitus) based on the assessment of cardiohemodynamics, metabolism and pharmacogenetic analysis", state registration No. 0116U004983.

Hypertension is one of the major health maintenance problems due to the high prevalence of AH and the fact that this condition is one of the main risk factors for cardiovascular diseases and their complications, disability and mortality [10]. Vegetative dysfunction is the most widespread and unpredictable disorder of the young by the variety of its manifestations and results [8]. In the early stages of the AH development in case of absence of complaints from patients, an imbalance in the system of autonomic regulation of cardiac rhythm already appears [4], and in case of a pronounced clinical picture of AH, it is possible to prevent the most frequent complications arising from the traumas of target organs by means of the evaluation of the autonomic status. Clinicians face the difficult task of choice of the optimal therapy in each case, based not only on the BP indicators, but also on the nature of the functioning of the nervous system, which is directly related to the regulation of blood circulation.

Ethylmethylhydroxypyridine succinate (EMS) is an antioxidant drug with a wide spectrum of clinical activity, induced by its polyvalent mechanism of action: antioxidant (inhibits the processes of free radical oxidation, lipid peroxidation, activates superoxide dismutase what leads to an increase of the activity of the physiological antioxidant system as a whole); anxiolytic (due to modeling effect on GABA-receptor complex), antihypoxic (intrinsic antioxidant properties provided by the influence on endogenic respiration of mitochondria and activation of succinate oxidation pathway contributes to an increase of the

resistance of brain cells to oxygen deficiency), and also nootropic (increases the activity of neurotransmitters, improves synaptic transmission and interrelation of brain structures). [1].

The purpose of our study was to increase the efficacy of hypertension treatment in young adults with clinical signs of autonomic dysfunction.

Materials and methods. The study included 65 male patients with AH, aged 30 - 40 years old (mean age 35.6 ± 4.3 years). The average duration of AH was (2.9 ± 2.1) years. 32.3% of patients had AH of the 1st degree, 67.7% – of the 2nd degree. The diagnosis of AH was established in accordance with the recommendations of the European Society of Hypertension and the European Society of Cardiology (ESH / ESC, 2013). The control group consisted of 20 practically healthy males aged 30 - 40 years (mean age 35.3 ± 3.9 years). All the surveyed persons underwent general clinical examination, biochemical analysis of blood with determination of indicators of lipid metabolism, glucose, creatinine, neuro-ophthalmic examination, ECG registration in 12 standard leads. Ambulatory Blood Pressure Monitoring (ABPM) was performed with device "ABPM-02" (Meditech, Hungary). The following indicators were determined: daytime, nighttime, average daily (24 hours) SBP and DBP, HR. To detect vegetative dysfunction, "Screening questionnaire for revealing the signs of vegetative changes" (Wein A.M., 2003) was used. With a score greater than 15, vegetative dysfunction is assumed. In the examined patients with AH and autonomic dysfunction, the mean score was 47.3 ± 1.7 , in the control group - 12.9 ± 1.5 points ($p < 0.001$).

To assess state and trait anxiety, the State-Trait Anxiety Inventory by Charles D. Spielberger (1973) was used. It was adapted by Yu. L. Khanin and contains 40 questions. The result was evaluated as follows: up to 30 – low anxiety, 31 - 45 – moderate anxiety, 46 and more – high anxiety.

Nonspecific changes in the functional state of the central nervous system were studied by the method of indirect recording of heart rate variability on the cardiographic complex of Holter ECG monitoring "Cardiosense" ("KhAI Medica", Ukraine). Registration and automated processing of ECG signals were performed with the calculation of the parameters of temporal and spectral analysis, as well as the indices obtained on their ground and proposed by R.M. Bayevsky [7]. The following parameters were used for the analysis of vegetative regulation:

– TI is the tension index of the regulatory systems, calculated as $TI = AMo / 2 \times BP \times Mo$
where AMo is the mode amplitude – the number of cardio intervals corresponding to the mode range (in %); VR – variation range – the difference between the maximum and minimum values of RR; Mo (mode) is the most commonly recorded RR value.

– SDNN – standard deviation of the duration of normal R–R intervals;

– pNN 50 – percent of all analyzed cardio intervals;

– RMSSD – the square root of the mean squared difference between complementary RR intervals.

Indicator of activity of parasympathetic link of vegetative regulation. The higher the RMSSD value, the more active is the link of parasympathetic regulation [9].

– LF / HF – index of vagosympathetic interaction, the ratio of high-frequency and low-frequency component of oscillations of heart rhythm. Indicates a shift of the vegetative balance toward the sympathetic or parasympathetic division.

After registration of the baseline data, the patients were randomly divided into 2 groups. Basic antihypertensive therapy was administered to 30 patients (group 1), and included an ACE inhibitor (Lisinopril 10-20 mg/day). The second group consisted of 35 patients who were prescribed complex therapy, which included an ACE inhibitor (Lisinopril 10-20 mg/day) and ethylmethylhydroxypyridine succinate (Mexiprim, Stada, Germany) 125 mg t.i.d. for 4 weeks. Indapamide 2.5 mg/day was added when necessary. Before the study initiation, the patients in both groups were compared by age, AH duration, levels of office BP, ABMP indices and HRV parameters (all $p > 0.05$).

All patients successfully completed the study according to the protocol. A revive study was performed after 4 weeks of treatment. Side and adverse effects have not been reported for this period.

Statistical processing of the study results was performed using the software Statistica 6.0 for Windows. During analysis, mean values (Me) were calculated and the interquartile interval (II) was recorded. Comparison of qualitative parameters was performed using Fisher's exact two-tailed test, and a comparison of quantitative indicators in the study groups was performed using the Mann-Whitney U test. Differences at $p < 0.05$ were considered statistically significant.

Results of the study and their discussion. In our study, baseline investigation of vegetative balance allowed us to establish that in patients with AH and clinical signs of autonomic dysfunction sympathicotonia was revealed in 42 patients (64.6%), vagotonia – in 20 (30.8%) and amphotonia in 3 (4, 6%) patients. The state of eutonia was not found. Since the activity of both departments of the autonomic nervous system is organized synergistically, the behavior of autonomic regulation during AH is evaluated

in terms of shifts in the activity of both sympathetic and parasympathetic links simultaneously [4]. HRV testing is often used to implement such control of autonomic nerve regulation. However, the results of HRV assessment in case of AH are often controversial. Some authors noted an increase in sympathetic activity, while others received directly opposite data [6].

Analysis of HRV indicators at baseline indicates the presence of vegetative disorders in the examined patients with AH and clinical signs of autonomic dysfunction (table 1).

Table 1

Dynamics of HRV parameters in patients with AH and clinical signs of autonomic dysfunction (M±m)

Index	Group of healthy persons (n = 20)	Group 1 (n = 30)		Group 2 (n = 35)	
		Baseline data	After treatment	Baseline data	After treatment
Mo, s	0.81±0.03	0.60±0.05	0.82±0.04***	0.63±0.04	0.83±0.01***
VR, s	0.20±0.02	0.14±0.01	0.18±0.01**	0.14±0.03	0.24±0.02**
AMo, %	31.8±1.5	62.7±2.5	53.3±2.5**	63.2±2.2	42.8±2.6***
TI, RU	97.6±3.1	349	176 ***	348±7	111±11***
SDNN, ms	82.1±3.1	63.1±3.1	68.7±3.3	63.6±3.3	79.8±3.9**
pNN 50, %	29.9±1.3	24.9±1.2	27.8±1.5	24.1±1.3	29.3±1.6**
RMSSD, ms	61.4±3.5	47.5±3.5	51.7±3.7	47.9±3.3	60.7±3.7*
LF/HF, RU	1.56±0.3	2.17±0.3	1.87±0.2	2.31±0.3	1.59±0.1

Notes: 1. * - reliability of differences compared to the original data; 2. * - p <0.05; 3. ** - p <0.01; 4. *** - p <0.001.

At baseline, the evaluation of HRV indices in patients with AH and clinical signs of autonomic dysfunction revealed that the mode amplitude exceeded the results of healthy individuals by 1.9 times, the tension index by 3.6 times, the variational range was reduced by 1.4 times, indicating prevalence of activity of the sympathetic division of the autonomic nervous system (table 1). In addition, compared with the control group in patients with AH and clinical signs of autonomic dysfunction, a significant decrease in general heart rate variability (SDNN) by 1.3 times and a decrease in the parasympathetic component of heart rate regulation (RMSSD) by 1.3 times were registered. During the correlation analysis of BP level and HRV indicators in all patients with AH strong negative correlations of SBP level with SDNN ($r = -0.70$; $p < 0.01$) and RMSSD indicators ($r = -0.73$; $p < 0.01$) were registered, correlations of these HRV indicators with DBP level were weaker with SDNN ($r = -0.43$; $p < 0.05$) and RMSSD indicators ($r = -0.41$; $p < 0.05$).

After the course of treatment, BP correction to the target values was achieved in 23 (76.7%) patients in group 1 and in 31 (88.6%) in the second group. The dynamics of average indicators of office BP is presented in table 2. After 4 weeks of treatment there was a significant and equally pronounced decrease in SBP ($p < 0.001$) and DBP ($p < 0.05$).

An analysis of DMBP indicators after 4 weeks showed high antihypertensive efficacy of both treatment regimens (table 2).

Table 2

Change of office BP and DMBP indices in the treatment time course of patients with AH and clinical signs of autonomic dysfunction (M±m)

Index	Group 1 (n = 30)		Group 2 (n = 35)	
	Baseline data	After 4 weeks	Baseline data	After 4 weeks
Sphygmomanometry: SBP, mm Hg	158.1±4.6	133.3±3.9***	158.9±4.8	131.7±3.7***
DBP, mm Hg	95.2±4.3	83.6±3.8*	95.9±4.1	81.4±3.9*
DMBP: 24 hrs				
SBP, mm Hg	147.1±4.1	127.3±3.8***	149.3±4.5	128.1±4.6***
DBP, mm Hg	94.5±4.3	78.8±3.5**	94.9±4.1	79.1±3.8**
TI SBP, %	69.6±7.4	18.3±6.7***	68.9±7.5	15.1±6.3***
TI DBP, %	58.7±7.3	16.3±6.4***	59.1±7.1	11.7±5.8***
Day				
SBP, mm Hg	153.1±4.6	123.1±4.1***	154.3±4.7	127.5±4.1***
DBP, mm Hg	97.3±4.6	81.4±4.1**	97.1±4.8	78.7±4.3**
TI SBP, %	67.6±6.3	27.6±6.9***	66.3±7.8	24.7±7.1***
TI DBP, %	58.1±7.9	19.9±7.5***	58.3±8.3	15.3±8.7***
Night				
SBP, mm Hg	140.7±4.6	118.4±6.3***	141.8±4.7	110.7±6.1***
DBP, mm Hg	86.7±4.3	73.1±3.9*	86.3±5.1	68.4±4.3*
TI SBP, %	72.3±8.7	17.9±9.4***	73.1±9.3	15.7±8.1***
TI DBP, %	52.1±8.3	12.4±8.7***	53.5±8.5	10.1±9.1***

Notes: 1. * - reliability of differences compared to the original data; 2. * - p <0.05; 3. ** - p <0.01; 4. *** - p <0.001.

During evaluation of HRV indicators (table 1), it was found that the patients of the 1st and 2nd groups had a decrease in sympathetic activity on the background of therapy. Thus, there was a decrease in the tension index in the 1st group by 49.6% ($p < 0.001$) and in the 2nd group by 68.1% ($p < 0.001$); mode amplitude index – by 15% ($p < 0.01$) and 32.3% ($p < 0.001$); an increase in the variation range by 28.6% ($p < 0.01$) and 71.4% ($p < 0.001$) respectively, indicating an improvement in vegetative tone, and in the 2nd group – restoration of vegetative balance. In patients with AH and clinical signs of autonomic dysfunction, which additionally received EMS, a significantly better result was observed contrary to the comparison group according to the tension index (36.9%; $p < 0.001$) and the variation range (55.6%; $p < 0.01$). Therefore, in the group which received additional EMS, harmonization of autonomic nervous system function was registered.

At the same time, total HRV according to SDNN data and parasympathetic component of regulation of the cardiovascular system according to the RMSSD indicator increased. In particular, the SDNN index, reflecting the cooperative effect of the autonomic regulation of blood circulation, increased by 8.9% ($p > 0.05$), and in group 2 – by 25.5% ($p < 0, 01$) respectively (table 1) in patients of group 1; RMSSD index, which indicates the activity of the parasympathetic link of autonomic regulation in the 1st group increased by 8.84% ($p > 0.05$) and in the 2nd group - by 26.7% ($p < 0.01$) respectively; pHN 50 index – a predominance degree of parasympathetic regulation link in the 1st group increased by 11.6% ($p > 0.05$) and in the 2nd group – by 21.6% ($p < 0.01$), respectively. Thus, in patients with hypertension and clinical signs of autonomic dysfunction, complex therapy with addition of EMS resulted in more pronounced increase in total HRV, decreased activity of the sympathetic division of the autonomic nervous system and restoration of the autonomic balance according to the temporary HRV indicators.

Analysis of the psycho-emotional state at baseline showed that in the examined patients with AH and clinical signs of autonomic dysfunction increased levels of anxiety on the scale by Ch.D. Spielberg-Y. L. Khanin were noted. It is explained by the specifics of the patients' response to the disease and the changes in psychological status related to it, as well as premorbid characteristics of the patients' personalities. Thus, the degree of reactive and trait anxiety made (48.3 ± 1.9) and (47.0 ± 1.5) in the 1st group and (49.1 ± 1.4) and (48.9 ± 1.6) in the 2nd group respectively. Most patients with AH showed high and moderate levels of reactive and trait anxiety (table 3).

Table 3

Indicator changes in reactive and trait anxiety in patients with AH and clinical signs of autonomic dysfunction (M \pm m)

Indicator	Level	Group	Baseline data	After treatment
Reactive anxiety	low	1	28.6 \pm 1.5 (n = 2)	28.9 \pm 1.4 (n = 5)
		2	28.2 \pm 1.3 (n = 2)	28.1 \pm 1.2 (n = 22)
	moderate	1	39.7 \pm 1.6 (n = 12)	36.3 \pm 1.5 (n = 13)
		2	41.5 \pm 0.8 (n = 12)	34.1 \pm 0.9* (n = 11)
	high	1	56.3 \pm 2.3 (n = 16)	52.0 \pm 2.1 (n = 17)
		2	56.1 \pm 1.3 (n = 16)	46.3 \pm 0.5* (n = 2)
Trait anxiety	low	1	28.2 \pm 1.2 (n = 3)	28.6 \pm 1.1 (n = 5)
		2	28.6 \pm 1.3 (n = 3)	28.1 \pm 1.5 (n = 22)
	moderate	1	41.6 \pm 1.2 (n = 14)	39.6 \pm 1.5 (n = 18)
		2	43.7 \pm 1.1 (n = 13)	33.5 \pm 0.7* (n = 6)
	high	1	55.3 \pm 1.7 (n = 13)	53.6 \pm 2.1 (n = 12)
		2	55.9 \pm 1.3 (n = 14)	47.1 \pm 0.5* (n = 2)

Notes: 1. * - reliability of differences compared to the original data; 2. * - $p < 0.05$.

The results of the study allowed us to establish that the patients of group 1 with low, moderate and high levels of reactive and trait anxiety at baseline after the treatment did not have any significant changes (table. 3). At the same time, after the course of complex therapy with the addition of EMS a pronounced decrease of the level of reactive anxiety by 41% ($p < 0.001$) and trait anxiety by 37.8% ($p < 0.001$) was present. Moreover, EMS proved to be the most effective in the high and moderate anxiety group what was proved by the change of 17 patients to low level of reactive and trait anxiety respectively (table 3). However, in patients with low anxiety at baseline, there were no significant changes of this indicator.

It should be noted that the time course difference of the level of state and trait anxiety during complex therapy with the addition of EMS was statistically significant (48.4%, $p < 0.01$) and (37.8%, $p < 0.05$) respectively in the comparison group. The data obtained demonstrates an increase of the specific influence on the cortical excitation and subcortical formations, what modulates psycho-emotional processes in the body. Therefore, in young males with AH and clinical signs of autonomic dysfunction on

the background of complex treatment with addition of EMS a positive time course of state and trait anxiety was noted, suggesting the improvement of patients' emotional state.

In the pathogenesis of hypertension, activation of the sympathetic nervous system plays an important role, especially at the initial stages [3]. A high level of anxiety is accompanied by an increase of sympathetic influences on cardiac activity and leads to the tension in regulatory systems. However, the features and patterns of manifestation of psychosomatic disorders during AH in young people with clinical signs of autonomic dysfunction require further study. In our study, the analysis of the daily BP profile and condition of the autonomic nervous system in young men with AH, despite a short history of the disease, revealed abnormalities in the circadian rhythms of BP associated with impaired autonomic regulation of the cardiovascular system in the form of a relative increase of sympathetic influences and weakening of parasympathetic ones, what corresponds to the previous studies [5]. In the examined patients with AH and autonomic dysfunction, a decrease in the level of psychological health was revealed, what was expressed in an increase of the number of patients with high and moderate levels of reactive and personal anxiety. Complex antihypertensive therapy with addition of EMS significantly improved HRV parameters, what was expressed in a decrease of the stress index and restoration of the autonomic balance according to temporal indicators of heart rate variability. It was noted that EMS has a pronounced tranquilizing and anti-stress effect, an ability to eliminate anxiety, fear, tension, anxiety [2]. In our study, it was found that the addition of EMS to the antihypertensive therapy can reduce the level of reactive anxiety, what allows to increase the body's functional capacities secondary to the improvement of the psychoemotional state.

Conclusion

Thus, the inclusion of EMS in the complex treatment of young males with AH and clinical signs of autonomic dysfunction has a positive effect on clinical symptoms, contributes to the restoration of vegetative balance and correction of psycho-emotional state.

References

1. Azova MM, Blagonravov ML, Frolov VA. Effect of phosphocreatine and ethylmethylhydroxypyridine succinate on the expression of Bax and Bcl-2 proteins in left-ventricular cardiomyocytes of spontaneously hypertensive rats. *Bull Exp Biol Med.* 2015; 158(3):313-314.
2. Carney EF. Succinate homeostasis protects against lithogenesis and hypertension. *Nat Rev Nephrol.* 2019; 15(5):255.
3. Esler M. Mental stress and human cardiovascular disease. *Neurosci Biobehav Rev.* 2017; 74(Pt B):269-276.
4. Garafova A, Penesova A, Cizmarova E, Marko A, Vlcek M, Jezova D. Cardiovascular and sympathetic responses to a mental stress task in young patients with hypertension and/or obesity. *Physiol Res.* 2014; 63 (4):459-67.
5. Jarczewski J, Furgala A, Winiarska A, Kaczmarczyk M, Poniatowski A. Cardiovascular response to different types of acute stress stimulations. *Folia Med Cracov.* 2019; 59(4):95-110.
6. Redina OE, Smolenskaya SE, Maslova LN, Markel AL. The genetic control of blood pressure and body composition in rats with stress-sensitive hypertension. *Clin Exp Hypertens.* 2013; 35(7):484-95.
7. Sammito S, Böckelmann I. Options and limitations of heart rate measurement and analysis of heart rate variability by mobile devices: A systematic review. *Herzschrittmacherther Elektrophysiol.* 2016; 27(1):38-45.
8. Sanatani S, Cunningham T, Khairy P, Cohen MI, Hamilton RM, Ackerman MJ. The Current State and Future Potential of Pediatric and Congenital Electrophysiology. *JACC Clin Electrophysiol.* 2017; 3(3):195-206. 9.
9. Thayer JF, Sollers JJ 3rd, Friedman BH, Koenig J. Gender differences in the relationship between resting heart rate variability and 24-hour blood pressure variability. *Blood Press.* 2016; 25(1):58-62.
10. Zhou D, Xi B, Zhao M, Wang L, Veeranki SP. Uncontrolled hypertension increases risk of all-cause and cardiovascular disease mortality in US adults: the NHANES III Linked Mortality Study. *Sci Rep.* 2018; 8(1):9418.

Реферати

ЛІКУВАННЯ АРТЕРІАЛЬНОЇ ГІПЕРТЕНЗІЇ У ЧОЛОВІКІВ МОЛОДОГО ВІКУ З КЛІНІЧНИМИ ОЗНАКАМИ ВЕГЕТАТИВНОЇ ДИСФУНКЦІЇ

Біловол О.М., Князькова І.І., Богун М.В., Луценко Р.В.

Метою дослідження було підвищення ефективності лікування артеріальної гіпертензії (АГ) у осіб молодого віку з клінічними ознаками вегетативної дисфункції. Обстежено 65 хворих АГ чоловічої статі (середній вік $35,6 \pm 4,3$ років) з клінічними ознаками вегетативної дисфункції, яких 30 (1 група) призначалась базисна терапія і 35 пацієнтам (2 група) додатково призначали етилметилгідроксипіридина сукцинат (ЕМС) протягом 4 тижнів. Після лікування корекція АТ до цільових значень була досягнута 76,7 % пацієнта 1-ї групи і 88,6 % 2-ої груп. На фоні терапії ЕМС, спостерігався більш виражене зростання загальної ВРС, зниження активності симпатичного відділу вегетативної

ЛЕЧЕНИЕ АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИИ У МОЛОДЫХ МУЖЧИН С КЛИНИЧЕСКИМИ ПРИЗНАКАМИ ВЕГЕТАТИВНОЙ ДИСФУНКЦИИ

Беловол А.Н., Князькова И.И., Богун М.В., Луценко Р.В.

Цель работы - повышение эффективности лечения артериальной гипертензии (АГ) у лиц молодого возраста с клиническими признаками вегетативной дисфункции. Обследовано 65 мужчин с АГ (средний возраст $35,6 \pm 4,3$ лет) с клиническими признаками вегетативной дисфункции, из которых 30 (1 группа) назначалась базисная терапия и 35 пациентам (2 группа) дополнительно назначали этилметилгидроксипиридина сукцинат (ЭМС) в течение 4 недель. После проведенного лечения коррекция АД до целевых значений была достигнута у 76,7% пациентов 1-й группы и 88,6% - второй групп. На фоне терапии ЭМС, наблюдался более выраженный рост общей ВРС, подавление активности симпатического отдела вегетативной нервной

нервової системи і відновленню вегетативного балансу згідно даних тимчасових показників ВРС, а також суттєва позитивна динаміка ситуативної та особистої тривожності. Таким чином, включення ЕМС у комплексну терапію лікування чоловіків молодого віку з АГ і клінічними ознаками вегетативної дисфункції позитивно впливає на клінічну симптоматику, сприяє відновленню вегетативного балансу і корекції психоемоційного стану.

Ключові слова: артеріальна гіпертензія у молодих, вегетативна дисфункція, варіабельність ритму серця, тривога, етилметилгідроксипіридина сукцинат.

Стаття надійшла 22.02.2019 р.

системы и восстановления вегетативного баланса по данным временных показателей ВРС, а также существенная положительная динамика ситуативной и личной тревожности. Таким образом, включение ЭМС в комплексную терапию лечения мужчин молодого возраста с АГ и клиническими признаками вегетативной дисфункции положительно влияет на клиническую симптоматику, способствует восстановлению вегетативного баланса и коррекции психоэмоционального состояния.

Ключевые слова: артериальная гипертензия у молодых, вегетативная дисфункция, вариабельность сердечного ритма, тревога, этилметилгидроксипиридина сукцинат.

Рецензент Єрошенко Г.А.

DOI 10.26724/2079-8334-2020-1-71-18-22

UDK 616.12-008.46-085:616.379-008.64

O.M. Bilovol, I.I. Kniazkova, M.V. Bohun, N.V. Kuzminova¹, N.Y. Osovska¹
Kharkiv National Medical University, Kharkiv
¹Vinnitsya National Pirogov Memorial Medical University, Vinnitsya

TREATMENT OF HEART FAILURE IN PATIENTS WITH DIABETES MELLITUS

e-mail sskripka72@gmail.com

The purpose of the work was to study the effect of fixed combination of meldonium dihydrate and γ -butyrobetaine dihydrate (MD+ γ -BD) on clinical, hemodynamic and glucometabolic parameters, as well as indicators of oxidant-antioxidant status in patients (pts) with heart failure (HF) and type 2 diabetes mellitus (DM). The total of 62 patients with HF and DM were examined. After registration of the baseline data, baseline therapy was prescribed to all patients, 30 of them (group 1) obtained an additional fixed combination of MD+ γ -BD 2 capsules three times a day for 3 months and 32 patients were included in the comparison group (group 2). After treatment in group 1, the increase of the distance walked was determined according to the 6-minute walk test by 31.2% versus 12.7% in group 2 ($p < 0.05$). There was an increase in left ventricular (LV) ejection fraction by 4.5% in group 1 versus 1.9% in group 2 ($p < 0.05$). Positive changes in glucometabolic parameters were observed. A decrease of the activity of lipid peroxidation processes according to the level of malondialdehyde ($\Delta -22.3\%$ in patients of group 1 versus $\Delta -11.2\%$ in group 2, $p < 0.05$) and an increase in the activity of erythrocyte superoxide dismutase (respectively $\Delta 29.5\%$ vs. 8.1% , $p < 0.05$) were found. Thus, an addition of a fixed combination of MD+ γ -BD in the complex therapy of pts with HF and type 2 DM improves clinical symptoms in patients, has a positive effect on the structural and functional parameters of the left ventricle, glucometabolic parameters and imbalance of the oxidant-antioxidant system by increasing the activity of intracellular antioxidant enzymes.

Key words: heart failure, type 2 diabetes mellitus, structural and functional changes of the left ventricle, lipid peroxidation, fixed combination of meldonium dihydrate and γ -butyrobetaine dihydrate.

The work is a fragment of the research project "Optimization of diagnosis and treatment of comorbid pathology (hypertension and type 2 diabetes mellitus) based on the assessment of cardiohemodynamics, metabolism and pharmacogenetic analysis", state registration No.0116U004983.

Heart failure (HF) is a rapidly growing disease of the clinical cardiology in many countries [2]. Despite significant advances in the study of pathogenesis, clinical findings and treatment, this pathology remains widespread with dismal course and prognosis. Patients with HF of ischemic etiology are characterized by the involvement of target organs, behind which lie hypoxia processes caused by impaired macro- and microcirculation [4].

Type 2 diabetes mellitus (DM) is also a rapidly growing medical and social problem in all industrially developed countries. It is particularly disturbing that the prevalence and incidence of type 2 DM in recent years have tendency to increase in young age groups [12]. More than 50% of patients with type 2 DM do not even suspect that they have this disease because it can be asymptomatic for many years [3]. The presence of type 2 DM in patients contributes to the formation of additional hemodynamic and metabolic damage to the heart and the blood stream [6].

Predictably poor and even fatal effect of DM on the prognosis of HF have been established in numerous clinical studies; diabetes mellitus was not only associated with an increase in mortality but was also recognized as an independent predictor in HF patients [10, 13]. The problem of optimization and individualization of pharmacotherapeutic approaches in this category of patients is extremely urgent. Therefore, it is important to optimize the treatment of patients with HF in combination with type 2 DM, taking into account clinical features found in this category of patients.

In therapeutic practice, 3- (2,2,2-trimethylhydrazinium) propionate dihydrate (meldonium dihydrate) has been widely used, the action of which is to optimize intracellular mitochondrial energy