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Efficiency of application of speleotherapy in treatment of patients with bronchial asthma in combination with coronary heart disease I–II FK as therapy of holster monitoring of ECG

Key words: *bronchial asthma, ischemic heart disease, speleotherapy, ECG monitoring*

Bronchial asthma (BA) leads to numerical complications, high disability with loss of ability to work, deterioration in quality of life and its duration. All this is associated with the untimely diagnosis and treatment of not only asthma, but also concomitant pathology, more commonly, coronary heart disease (CHD) [2, 3].

The known diagnostic algorithm for patients with bronchial asthma, according to the Order of the Ministry of Health of Ukraine of October 08, 2013 No. 868 [3], includes the definition: «... the functions of external respiration (hereinafter – FDD) (FEV1, NOSH-type); allergic studies (allergic history – the presence of allergic rhinitis, atopic dermatitis or asthma or atopic diseases in patients with his family, allergic skin tests with allergens, increased levels of general and specific IgE); determination of bronchial hyperresponsiveness (performed in patients with clinical symptoms that are characteristic of asthma, but in the absence of characteristic FDD disturbances, measured by the results of provocative tests with histamine, methacholine, and exercise) ...».

However, these methods do not reflect the state of the cardiovascular system, which leads to the failure to identify the initial stage of development of the coronary heart disease, when it runs latently, either by masking the clinical manifestations of asthma, whether in the form of painless ischemia or arrhythmia.

The appointment of a standard ECG (12 leads) in patients with asthma includes the detection of p-pulmonale, a right-head, which is formed when the pressure in a.pulmonalis is increased due to overload of a small circle of blood circulation.

However, this study does not show in full the violation of the side of the cardiovascular system in this category of patients, since, as a rule, it is carried out in the daytime and does not take into account that at night, under the action of vagus, there may be violations of rhythm and conduction in the form of: ventricular and atrial extrasystoles, sinus rhythm migration, signs of myocardial ischemia, spastic-type angina attacks, nightly arterial pressures. At the same time, according to biorhythmology, the peak of complications of cardiovascular disease occurs at 8–10 o'clock in the morning [4], which often arise in the form of acute coronary syndrome, various kinds of arrhythmias, an increase in blood pressure, which also contributes to coronarospasm, ischemia myocardium.

The pathogenesis of the supraventricular heart rhythm in the background of the asthma is due to an increase in the level of endogenous catecholamines, which leads to electrical instability of the myocardium. Including, stimulation of β-adrenergic receptors contributes to the local increase in the concentration of adrenaline in the sinus node, as well as the velocity of impulses through the atrioventricular node, increasing the risk of super-ventricular arrhythmias [4, 5, 6].

In addition, the diagnosis of coronary artery disease in patients with asthma is difficult if the primary illness

(BA) is in a state of aggravation and, as a result, patients do not receive adequate treatment, and even on the contrary, emphasis is placed on bronchodilator therapy, that is, sympathomimetic, which is contraindicated in CHD and thus the patient's condition deteriorates.

On the one hand, the drugs used in the treatment of asthma for bronchodilation are β2-agonists. Their addition to the body, along with the enlargement of the bronchi, can lead to an increase in the frequency of cardiac contractions, a decrease in diastolic blood pressure, an increase in the contractility of the heart muscle, an increase in the probability of supraventricular and ventricular arrhythmias, an increase in the duration of the corrected interval QT. Consequently, in the long run or frequent attacks of bronchospasm, patients themselves are in a position to be able to uncontrolled use of this group of drugs, which contributes to excessive activation of β1-receptors, to the emergence and / or deepening of existing CHD complications [5, 6, 8].

On the other hand, in the case of arrhythmogenic CHD, the use of most antiarrhythmic drugs in patients suffering from asthma is difficult or counter-indicative due to their side effects. Thus, preparations of the first group (lidocaine) are able to suppress the respiratory center, cause prolongation of the interval Q-T (Novocainamide), preparations of the group of cordarone cause interstitial lung fibrosis and so on. [5, 6, 7].

The foregoing explains the expediency of finding ways to early diagnosis of possible concomitant pathology, which forms a new, comorbid state, the treatment of which requires an increase in medication load, material costs and, often, the refusal of patients from treatment. Therefore, the inclusion in non-pharmacological (physical) factors, which can positively influence different pathogenetic links of numerical diseases, is substantiated.

Taking into account the literature on the sanogenetic nature of the effect of aerosol NaCl on the state of the bronchopulmonary system in asthma, as well as the presence of concomitant pathology in the form of coronary heart disease, which enhances the burden of hypoxic phenomena, the use of speleotherapy is pathogenetically grounded.

The study of the influence of dry, highly dispersed aerosol of natural rock salt on various mechanisms of patho- and sanogenesis of the respiratory tract showed that haloaerosol stimulates the respiratory tract mechanisms and has a sanogenic, bronchodilator, anti-inflammatory, immunocorrective effect. Dry aerosol of rock salt has an inhibitory effect on the growth and livelihoods of microorganisms, which is accompanied by the process of loss of their pathogenic properties. The natural antimicrobial effect of sodium chloride does not have a negative effect on local protection and contributes to the improvement of the biocenosis of the respiratory tract. The presence of light, negative air ions in the air-curative medium activates metabolism and local protection of biological tissues, acts favorably on both the cardiovascular and mucous membranes of the respiratory system. Staying in the hallocamera stabilizes the autonomic nervous system and makes a positive antidepressant action [8, 9].

That is, the therapeutic effect of speleotherapy is due to a complex of favorable factors of a stable microclimate, namely: constant temperature and humidity; increased concentration of free ions of sodium in the air; almost absolute purity of air; Slightly high content of CO2; an absolute absence of sound, light, olfactory, psychic and other stimuli. These factors in their aggregate reduce the intensity of manifestations of chronic inflammation, improve drainage of sputum [6, 7].

Consequently, there are many works in the literature that highlight the effectiveness of treatment in terms of respiratory system, in single cases – single or double ECG data and, less commonly, the use of Holter ECG monitoring in the dynamics of treatment, indicating the relevance of research to increase the level of diagnosis and treatment patients with asthma in combination with CHD.

The aim of the study. To study the clinical efficacy of additional appointment of speleotherapy course to basic medical treatment of patients with asthma in combination with CHD I–II FC according to Holter ECG monitoring.

Material and methods. The object of the study was patients with asthma in combination with coronary heart disease I–II FC, which were treated on the basis of the Center for Reconstructive and Rehabilitation Medicine (Clinic of the Odessa National Medical University (ONMedU)), namely 40 women and 31 people. The average age of the subjects was: in women – (49,30 ± 3,45), in men – (51,28 ± 3,24) years. Bronchial asthma had intermittent (21.13%) or persistent lung (45.07%) and average (33.80%) severity in remission. The diagnosis was established in accordance with the recommendations of cardiologists (ESC, 2016) and pulmonologists (GINA, 2016).

To evaluate the functional state of the cardiopulmonary resuscitation system, the BTL-08 Spiro Pro spirographs, which fully complied with modern ATS / ERS standards, Kardiosens and Meditech for Holter ECG monitoring, the Philips Clear Vue 350 ultrasound system, and Chem Well T. biochemical analyzer were used.

The basic therapy of patients with asthma in combination with CHD I–II FC was conducted according to the algorithm according to the Order of the Ministry of Health of Ukraine No. 868 of October 08, 2013, concerning the BA phase [7]. Thus, at exacerbation of asthma was intended: antibacterial, antihistamine therapy, bronchodilators (inhalation of 2-adrenomimetics for 7–10 days using a nebulizer). Further, in the absence of signs of exacerbation, 30 patients underwent standard treatment (control group – KG), ie, the use of metered aerosol for inhalations in the combination of salmeterol (25 micrograms) with fluticasolpropionate (125–250 micrograms) in the form of Ceretid «Evohaler», or Ceretid «Discus «(50 μg / 250 μg, respectively), hypolipidemic therapy, metered motor regimen. The treatment group – 1 (LH-1) was 41 patients, with which the basic complex was supplemented with the appointment of speleotherapy.

Speleotherapy was performed in a speleocamera made of natural salts (Na, Cl, K, Mg). The course of treatment consisted of 10–15 procedures, which were conducted

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in the first half of the day (from 9–00–14–00), duration 40–50 minutes. The influence of speleotherapy on spirographic data was detected by means of dynamic control before and after treatment. Statistical processing of the obtained results is carried out.

Research results and their discussion. According to the results of HM ECG in patients with this comorbidity, the following violations were mainly recorded: in sinus tachycardia, supraventricular extrasystole, in particular, 63.33% and 73.17%, respectively, in the COG and LK-1 group, were observed in more than 90%, often 53.33% and 68% respectively, especially at night, changes in the ST segment that were not registered at standard ECG withdrawal, and other signs of myocardial ischemia.

After the use of LK-1 in patients with asthma in combination with CHD I–II FK, there was a decrease in the frequency of heart rate (before treatment of sinus tachycardia in (90,24 ± 5,88)%, after (73,17 ± 5,09) Mentally reduced the number of supraventricular (from 73.17% to 60.97% after treatment) and ventricular extrasystoles (from 34.14% to 24.39%).

The presence of signs of an incomplete blockage of the right leg of the Gisson bundle, which had an intermittent character before treatment, decreased by 3.34% in the comparison group and 7.31% in the LK-1 group ($p < 0.05$) (tabl.).

At the same time, a decrease in the number of episodes of myocardial ischemia, a slight decrease in episodes of depression of the ST segment under the influence of LC-1 by 2.44% has been registered. In the comparison group, insignificant signs of violation of the processes of repolarization remained without significant changes.

Effectiveness was more clearly observed in the use of LK-1, which contributed to the restoration as a function of the lungs, due to the saturation of cells with useful ions, the purification of respiratory tract microflora from dust and harmful bacteria, and the activity of the cardiovascular system in the form of a certain reduction in the manifestations of arrhythmia.

After 3 weeks of follow-up after treatment for LK-1 in patients with asthma in combination with CHD I–II FC revealed a positive dynamics based on the BMC ECG, in the form of a prescriptive reduction in the mean daily heart rate, the incidence of supraventricular extrasystoles, primarily daytime, which showed favorable changes in the functional and somatic status of patients, both from the respiratory and cardiovascular systems (see Table), but in patients who had been assigned only basic therapy, the data obtained did

Table

Dynamics of indicators of XM ECG patients with asthma in combination with CHD in the appointment of a speleotherapy course against basic medical treatment

Groups of patients Indicators	CG (n = 30) Before treatment		CG (n = 30) After treatment		MC –1 (n = 41) Before treatment		MC –1 (n = 41) After treatment	
	abs	q ± mq (%)	abs	q ± mq (%)	abs	q ± mq (%)	abs	q ± mq (%)
Sinus tachycardia (beats / min)	25	83,33± 6,88**	21	70,0± 8,37**	37	90,24± 8,63**	28	68,29± 7,27**
An incomplete blockage of the right leg of the Gisson bundle (%): rack features intermittent character	13 4 9	43,33± 9,05** 13,33± 6,21 26,67± 8,07	11 4 7	26,67± 8,07** 13,33± 6,51 23,33± 7,72	19 7 12	46,34± 3,19** 19,51± 5,02 29,26± 5,88	15 6 9	36,59± 7,52** 14.63± 5,52 21,95± 6,46
Ventricular extrasystoles (EX) (< 30): a) daytime b) nightly	10 7	33,33±8,61** 23.33± 7,23	8 5	26,27± 8,07** 16.67± 6,80	14 9	34,14±7,41** 21.95± 6,46	10 6	24,39± 6,71** 14.63± 5,52
Ventricular extrasystoles (EX) (< 30): a) daytime b) nightly	2 2	6,67± 4,56** 6,67± 4,56	1 1	3,33± 3,28** 3,33± 3,27	3 2	7,31± 4,07** 4,88± 3,36	2 1	4,88± 3,36** 2,43± 2,41
Supraventricular (EX) rare: a) daytime b) nightly	21 19	70,17± 8,37** 63,33 ± 8,80	19 17	63,33± 8,80** 56,67 ± 8,06	30 21	73,17± 5,03** 51,21 ± 7,81	25 17	60,97± 7,62** 41,46 ± 7,69
Supraventricular (EX) frequent: a) daytime b) nightly	16 13	53,33± 3,59** 43,33 ±3,65	14 11	46,66± 3,62** 36,66 ±2,38	28 19	68,29± 4,52** 46,34 ±3,65	26 18	63,41± 4,52** 43,90 ±3,17
Supraventricular tachycardia	3	10,07 ± 5,48	2	6,67± 4,56	4	9,76 ± 4,73	2	4,88± 3,36
Low amplitude of the w T	10	33,33±8,61	9	30,00± 8,37*	11	34,14± 6,92*	10	24,39± 6,71**
T-wave inversion: Early ventricular repolarization syndrome	7 3	23.33± 7,23** 10,07± 5,34*	6 2	20.19± 7,30** 6,67± 4,56*	8 4	19.51± 6,19** 9,76± 4,63*	6 3	14.63± 5,52** 7,32± 4,07*
Depression of the segment ST> 1,00 mm	3	10,07 ± 5,48**	3	10,07 ± 5,48	4	9,76± 4,71**	3	7,32± 4,07*

Note: differences in metrics: * – p < 0,01; ** – p < 0,001; ***

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not show significant differences. It should be noted that until treatment, the manifestations of arrhythmias were found in the study of patients in both groups.

Thus, the use of speleotherapy in the complex treatment of asthma in conjunction with coronary heart disease promotes the resection of broncho-pulmonary, cardiological manifestations of this comorbid state.

Conclusions:

1. The use of HM ECG in both groups contributed to the early detection of rhythm disturbances, especially during the night period, which could not be diagnosed with the removal of a standard ECG, which is useful in the selection of pathogenetically substantiated therapies.

2. Additional appointment of speleotherapy to the basic pharmaceutical complex for patients with asthma during the remission in combination with CHD I–II FC contributed to a longer-term preservation of the improvement of the subjective state of the patient, reduction of attacks of breath, cardialgia, arrhythmogenic violations, decrease in the dose of the prescribed bronchodilator.

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