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CORONARY HEART DISEASE COMBINED WITH HYPERTENSION

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Abstract

The most common cardiovascular diseases —ischemic heart disease, hypertension, and chronic heart failure—are among the most pressing health problems in any society and form the basis of the socially determined diseases identified by the WHO. At the beginning of this century, cardiovascular diseases were the leading cause of death in most economically developed countries. The continuous increase in the number of patients with cardiovascular diseases, their younger age, and significant social consequences (increasing morbidity, disability, and mortality) are leading to increased healthcare costs both in Tashkent and worldwide.

The incidence of coronary heart disease (CHD) among men under 50 ranges from 8.4% to 12.6%, hypertension from 5.4% to 14%, and heart failure from 3.2% to 11%, increasing with age. Despite significant advances in drug therapy, the share of cardiovascular diseases in the mortality structure of the population has remained virtually unchanged over recent decades, accounting for more than half. Today, among developed countries, Europe and Russia have the highest mortality rates from CHD and hypertension, which have doubled over the past 10 years.

A key objective of modern medicine is to improve diagnostic, therapeutic, and preventive methods for cardiovascular disease complications. Their outcome is determined by the effectiveness of the final stage of medical rehabilitation, which typically involves spa treatment. Interest in optimizing spa treatment for cardiac patients is growing significantly in the current context, given the current trend

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toward shorter hospital and sanatorium stays, diversification of spa treatment methods, and an increase in the number of patients with comorbidities.

The differences in the therapeutic effects of spa therapy for cardiac patients may be due to seasonal changes in the composition and intensity of the various combinations (variants) of leading natural therapeutic factors—climate and mineral waters—acting on the body. Such variable climatobalneotherapy may determine the effectiveness of spa treatment for patients with cardiovascular diseases at different times of the year, depending not on the calendar, but on the climatotherapeutic season, which includes a combination of various climatotherapeutic methods (aerotherapy, heliotherapy, and thalassotherapy), as well as different types of baths. However, there is currently no unified methodology for spa treatment for cardiac patients at different times of the year, primarily due to a lack of data on the effectiveness of various combinations of climatotherapeutic and balneological factors, the syndromic-pathogenetic effects, and the nature of the body's adaptation to climatic contrasts. The concept of a "climate-therapeutic season" as a rational combination of methods of aero-, helio- and thalassotherapy has not received scientific substantiation.

According to current guidelines for treating patients with arterial hypertension, the initiation and nature of medical intervention are determined by the presence of various types and degrees of hemodynamic disturbances and the level of autonomic regulation of heart rhythm, which are the key factors in the pathogenesis. These factors determine the level of adaptive reserves and physical exertion thresholds, the effectiveness and prognosis of spa therapy, and dictate the treatment strategy for these patients in sanatoriums. Surrogate criteria of effectiveness (hemodynamic parameter dynamics) currently do not fully meet the requirements of evidence-based medicine and should be supplemented by integrated criteria for assessing quality of life, the methodology for applying which at the spa stage has not been developed and is discussed in isolated studies. These criteria are closely linked to the characteristics of the pathogenesis and clinical course of the disease (predictors), which have not been identified in spa therapy for patients with cardiovascular pathology.

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The varying therapeutic effects of artificial physical therapeutic factors in the complex therapy of patients with hypertension and coronary heart disease with different genotypes suggest a genetic basis for the individual sensitivity of cardiac patients to natural physical factors. However, the problem of genetic determination of the various therapeutic effects of natural physical therapeutic factors (physiogenetic mapping), as well as the assessment of gene interactions in "gene networks," has not been adequately formulated in modern balneology.

Thus, the widespread prevalence and social significance of cardiovascular diseases and the insufficient effectiveness of medical rehabilitation of cardiac patients make it necessary to scientifically substantiate the principles of variant climatobalneotherapy at one of the world's leading federal climatobalneotherapeutic resorts.

Determining the clinical effectiveness of various options for spa therapy, its optimal regimens for prescribing to patients as a method of targeted impact on the main links in the pathogenesis of diseases and developing on this basis standards for spa treatment (as a federal standard of medical technologies that determines the guaranteed volume of diagnostic and therapeutic measures in patients with a specific disease, as well as requirements for the quality of their implementation and the final results) is one of the pressing scientific problems of modern balneology and lies in the mainstream of promising areas of scientific development of modern physiotherapy - personalized and evidence-based physiotherapy, as well as physiogenetics .

The aim of the study was to examine coronary heart disease in combination with hypertension.

Research objectives

1. To study the nature of blood circulation regulation and the functional properties of systems that ensure homeostasis in patients with cardiovascular pathology during spa treatment at different times of the year.
2. To evaluate the dynamics of the main indicators characterizing the course of hypertension, under the influence of various climatic and balneological factors in different climatic treatment seasons.

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3. To analyze changes in indicators characterizing the course of coronary heart disease in patients with different functional classes of angina pectoris as a result of spa treatment in different climatic seasons.

Study Results

A scientifically substantiated and formulated concept for variable climatobalneotherapy for cardiac patients allows for an objective assessment of the current patient condition and the recommendation of spa treatment options during different climatotherapeutic seasons. A scientific substantiation is presented for the syndromic and pathogenetic effects of various variants (combinations) of climato- and balneotherapeutic factors on the leading pathogenesis links in patients with cardiovascular pathology. A significant decrease in adaptive reserves and a disruption of the functional systems maintaining homeostasis with a sharp predominance of the adrenergic type of regulation were identified in cardiac patients arriving at the spa, which are most pronounced during the spring climatotherapeutic season. An increase in adaptive reserves and an improvement in the functional state of the homeostasis-maintaining systems were found in cardiac patients during the course of spa treatment in all climatotherapeutic seasons except spring.

A prospective study revealed improvements in clinical status, hemodynamic parameters, psychophysiological status, autonomic regulation, and quality of life in patients with hypertension, coronary heart disease, and chronic heart failure (CHF) following various climato- and balneotherapy approaches. Their main therapeutic effects were verified, and the likelihood of their occurrence in different climato-therapeutic seasons was assessed. The composition of physical treatment methods during different climato-therapeutic seasons at the resort was substantiated, and seasonality as a factor in the effectiveness of climato-balneotherapy was assessed .

Seasonal patterns in the dynamics of indicators characterizing the course of major cardiovascular diseases were identified under the influence of various combinations of therapeutic physical factors. A decrease in systolic and diastolic blood pressure (SBP) was observed in patients with persistent hypertension,

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primarily during the summer climatic treatment season. Positive dynamics in subjective disease manifestations, changes in VEM test parameters, and silent myocardial ischemia were recorded in patients with coronary artery disease (CAD) and various FCs of exertional angina, most pronounced during the summer and autumn climatic treatment seasons. In patients with varying degrees of CHF severity, an increase in physical performance was demonstrated, primarily during the autumn climatic treatment season.

Significant impairments in the functional systems regulating blood circulation have been identified, determining the effectiveness of the adaptation process, which can impact the outcome of spa treatment. Spa treatment regimens for patients with cardiovascular diseases using various climatotherapy and balneotherapy options have been substantiated, and the effectiveness of using natural physical factors in patients with cardiovascular pathology (improving clinical, psychological, instrumental, and laboratory parameters) during various climatotherapy seasons has been determined.

To assess seasonal fluctuations in the effectiveness of climatotherapy, a classification of climatotherapeutic seasons was proposed and tested. This classification characterizes dynamic changes in the nature and intensity of natural therapeutic factors affecting the body. The most informative clinical and instrumental methods for determining the predisposition to the therapeutic effects of various combinations (variants) of climatobalneotherapy in patients with the main cardiovascular diseases—hypertension, ischemic heart disease, and chronic heart failure—were identified.

A treatment strategy has been developed for patients with cardiovascular diseases with varying levels of risk factors for complications in different climatic treatment seasons. The combined use of aero-, helio-, and thalassatherapy during the summer climatic treatment season, along with hydrogen sulfide and ozone baths, has been proven to be beneficial for patients with combined cardiovascular pathology. The use of hydrogen sulfide baths primarily in patients with hypertension, and ozone baths in patients with coronary heart disease and CHF, has been scientifically substantiated.

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The functional state of the regulatory apparatus of the circulatory system in patients with cardiovascular pathology admitted to spa treatment in all climatic treatment seasons is characterized by a sharp predominance of the adrenergic type of regulation, a significant disruption of the state of the functional systems that ensure homeostasis and a decrease in the adaptive capacity of the body.

During a course of spa treatment in all climate-healing seasons except spring, adaptation reserves are enhanced and the mixed type of cardiovascular regulation is restored; spring is the worst functional basis for adaptation compared to other seasons.

In patients with cardiovascular pathology, different combinations (variants) of climatobalneotherapy cause different changes in the functions of the cardiovascular and autonomic nervous systems, which allows us to distinguish different "climatotherapeutic seasons", not by the calendar season, but by the combination and intensity of the combinations of air, sun baths and sea bathing used during these periods in conjunction with hydrogen sulphide and ozone baths. Sanatorium-resort treatment significantly reduces systolic and diastolic blood pressure in hypertensive patients with persistent hypertension and does not significantly alter hemodynamic parameters in hypertensive patients with target blood pressure, nor in individuals without hypertension. The hypotensive effect is greatest in patients during the summer, climatically beneficial season, and minimal in the spring.

Conclusions

In patients with coronary heart disease and angina of functional classes I and II, a course of climatobalneotherapy demonstrated positive dynamics in subjective disease manifestations, improved myocardial contractility, exercise tolerance, and regression of silent ischemia parameters, most pronounced in the summer and autumn climatotherapeutic seasons. Various combinations of climatobalneological factors significantly increased physical performance in most patients with CHF, most pronounced in the autumn and least pronounced in the winter climatotherapeutic seasons.

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The effectiveness of spa treatment is highest in patients with a combination of hypertension and ischemic heart disease complicated by CHF during the summer and autumn climatic treatment seasons and lowest in patients with hypertension and uncomplicated CHF during the spring climatic treatment season. Negative outcomes from spa treatment are significantly more common in patients with combined hypertension and ischemic heart disease, complicated and uncomplicated CHF during the spring climatic treatment season, and less common in patients with uncomplicated CHF, isolated hypertension and ischemic heart disease, and in patients with ischemic heart disease complicated by CHF.

The therapeutic effects of a combination of climatotherapy with hydrogen sulfide and ozone baths in patients with cardiovascular disease are realized through the predominant effect of ozone baths on myocardial contractility, while hydrogen sulfide baths influence total vascular resistance. The severity of climatotherapy's therapeutic effect in patients with cardiovascular disease depends on the polymorphisms of genes regulating myocardial contractility and metabolism.

Factors influencing the outcome of spa treatment for patients with cardiovascular pathology (predictors of effectiveness) are: male gender, overweight, abdominal obesity, diabetes mellitus, history of myocardial infarction, atherogenic coefficient over 3.0, serum cholesterol levels in the range of 5.0-6.5 mmol/l and uric acid over 0.31 mmol/l, inconsistent pathogenetic drug therapy, spa treatment in the winter climatic treatment season.

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