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The Potential of Health Tourism Regarding Stimulation of Functional Capabilities of the Cardiovascular System

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ABSTRACT

The use of coronary artery bypass grafting due to its complexity and invasiveness requires effective physical rehabilitation. In this regard, inclusion of health tourism into the composition of these measures was considered to be very promising, which could significantly minimize the consequences of the operation in the late postoperative period and improve the quality of life of patients and their degree of adaptation to any form of activity. The study was conducted on 37 patients aged 45-65 years who underwent coronary artery bypass grafting 3 months ago. Patients who received rehabilitation using wellness tourism showed an acceleration and deepening of recovery. Only with its use it was possible to more fully strengthen the cardiovascular system, to optimize the overall physical fitness and ability to self-service. One can think that the use of health tourism provides a quick and pronounced healing effect in patients after coronary artery bypass grafting due to powerful stimulation of the muscular, vascular, respiratory and nervous systems, balancing the processes of anabolism and catabolism and stimulating protein synthesis throughout the body.

KEY WORDS: CORONARY ARTERY BYPASS GRAFTING, REHABILITATION, HEALTH, TOURISM, REHABILITATION.

INTRODUCTION

In the modern world there is a widespread prevalence of cardiological pathology (Medvedev et al., 2007b). Its presence in a significant part of the population, especially of working age, weakens the health of the population as a whole and creates a significant burden on healthcare facilities. This problem stimulates the development of cardiology in all countries of the world, which goes in two ways. One way is to improve the pharmacological effects on the patient's body in order to stabilize their condition. The second way is more radical - it is associated with the improvement of surgical operations on the heart and blood vessels. One of such operations is coronary artery bypass grafting, through which it is possible to increase the duration and quality of life for a large number of people with coronary heart disease. Recently, the number and quality of such operations has increased in the world (Uzhegov, 2005, Skoryatina et al., 2019).

Now coronary artery bypass grafting is considered as a priority treatment for coronary artery lesions. By coronary artery bypass grafting, the necessary blood flow in the narrowed arteries is restored, myocardial hypoxia is eliminated, myocardial infarction is prevented,

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its contractile function is strengthened, and the quality and life expectancy of patients improves (Avaliani et al., 2005).Coronary artery bypass grafting is a complex surgical procedure that involves bones and muscles of the chest, heart muscle and blood vessels. Very important for the recovery of patients is the implementation of rehabilitation measures in the postoperative period aimed at minimizing the consequences of the operation, preventing and treating postoperative complications, and increasing the patient's adaptability to motor activity, along with the recovery time, (Mavrodiy, 2017; Mal et al 2018, Makhov et al., 2018b). The aim of the present study was to evaluate the effectiveness of the physical rehabilitation program for patients who underwent coronary artery bypass grafting based on health tourism.

MATERIALS AND METHODS

The study involved 37 patients of 45-65 years age, who underwent coronary artery bypass grafting 3 months ago. Randomly, these patients were divided into 2 equal comparable groups - experimental and experimental. An experimental group (18 people) underwent rehabilitation according to the standard program of the rehabilitation center. It included physiotherapy, classes on simulators, physiotherapy and massage. The experimental group (19 people) underwent rehabilitation according to the program, which was based on health tourism with elements of therapeutic exercises with breathing exercises, the use of Scandinavian walking and massage. In both groups, rehabilitation lasted 2 months. The control group consisted of 22 clinically healthy volunteers of 45-65 years old, examined once. Patients of the experimental and experimental groups were examined twice - when taken under observation and at the end of the rehabilitation course.

Standard research methods were used: analysis and synthesis, estimates of heart rate, respiratory rate, and blood pressure levels. A standard orthostatic test was also performed. The patient was lying for 5 minutes, and then slowly got to his feet. The Ruthier test allowed us to determine the performance of the heart during exercise. The patient was in a lying position for 5 minutes, then the pulse rate was determined for a 15-second interval (P1) at rest. He then performed 30 squats for 45 seconds. After the load, the patient lies down and his heart rate was again counted for the first 15 seconds (P2), and then for the last 15 seconds of the first minute of recovery (P3).

The Ruthier Index was calculated using the formula: 4 x (P1 + P2 + P3) - 200/10.The 6-minute walk test is carried out by determining the distance that the patient is able to walk in 6 minutes along the corridor at the

Table 1. The results of the rehabilitation studies

Indicators	Traditional technique, M±m, n=18		Author's technique, M±m, n=19		Control, M±m, n=22
	exodus	in the end	exodus	in the end	
Heart rate, beats/minute	94.2±1.23	79.0±0.87 p<0.05	90.9±0.93	67.9±0.55 p<0.01 p1<0.05	69.9±1.12
Systolic blood pressure, mmHg	141.0±1.40	133.6±0.75 p<0.05	139.8±1.14	118.0±0.22 p<0.01 p1<0.05	120.1±0.98
Diastolic blood pressure, mmHg	87.0±0.60	80.0±0.57 p<0.05	89.5±0.85	71.7±0.32 p<0.01 p1<0.05	69.5±0.37
Respiratory rate, times / minute	21.3±0.26	18.6±0.46 p<0.05	21.9±0.31	17.3±0.11 p<0.01 p1<0.05	17.1±0.24
Orthostatic test, beats / minute	23.3±0.34	19.0±0.36 p<0.05	25.7±0.47	14.2±0.20 p<0.01 p1<0.05	14.0±0.36
Roufier Index, points	12.9±0.23	8.7±0.20 p<0.01	12.8±0.37	5.2±0.18 p<0.01 p1<0.05	4.5±0.15
6-minute walk test, steps/ minute	325.6±1.68	355.4±1.10	411.3±0.98	488.2±0.62 p<0.01 p1<0.05	501.2±1.54

Legend: p - the reliability of the dynamics during rehabilitation, p1 - the reliability of differences in the results of rehabilitation between groups.

highest possible pace. According to the results, the patient belongs to a certain functional class. The first class corresponded to a distance of 425-550 meters. The second functional class included a distance of 301-425 meters passed. To the third - 151-300 meters. In the fourth functional class, the patient was able to walk less than 150 meters in 6 minutes.The results of the study were processed using Microsoft EXCEL by calculating the Student t-test (t).

RESULTS AND DISCUSSION

The results of the studies carried out in the work are presented in Table 1. No significant differences in the indicators between patients in both groups were found. Comparison of the results of using both rehabilitation options for patients who underwent coronary artery bypass grafting revealed that for all indicators between them there are significant differences in favor of the author's exposure regimen. As a result of the rehabilitation in the experimental group, the heart rate decreased by 33.9%, reaching the control level. In the experimental group, this indicator decreased by only 19.2%. Similar dynamics in the experimental group was experienced by normalized indicators of systolic and diastolic blood pressure, which decreased by 18.5% and 24.8%, respectively. The use of the traditional regimen was accompanied by less functionally beneficial dynamics of blood pressure levels. This was accompanied by a decrease in the frequency of respiratory movements in both groups, more pronounced in the experimental group (26.6%), ensuring its exit to the control level.

During rehabilitation, the orthostatic test index experienced a decrease in the experimental group by 22.6%, in the experimental group by 80.9% with its exit in the second case to the control level. At the same time, the Ruthier index also returned to normal only against the background of the use of author's rehabilitation schemes. In the experimental group, it decreased by 2.5 times, while in the experimental group it decreased by only 48.3%.When evaluating the results of the 6-minute walk test, it turned out that the author's rehabilitation scheme provided a more pronounced than the traditional scheme increase in the number of steps that the patient is able to go through during the test (by 18.7%). Moreover, the achieved changes allowed this indicator to normalize during the observation period only in the experimental group. Coronary artery bypass grafting is a complex surgical intervention that allows you to restore hemodynamics in the arteries of the heart by bypassing the site of narrowing of the coronary vessel using shunts. It is a proven surgical method for the treatment of coronary heart disease (Bokeria et al., 2016). Despite the rapid and significant improvement in hemodynamics, after this operation, the general condition of these patients improves slowly. Often, recovery can be very delayed (Mal et al., 2018).

Given the importance of accelerating the process of rehabilitation of patients after coronary artery bypass grafting and especially increasing its effectiveness, we tested two rehabilitation schemes for such patients. More preferred results were obtained in a group of patients undergoing rehabilitation based on health tourism. This was largely due to the achievement of a more pronounced improvement in the state of the cardiorespiratory system and the level of their general physical capabilities.

The obtained results give reason to believe that the property of Wellness tourism with elements of easy exercises, breathing exercises, Nordic walking and massage earlier and more fully provides in patients undergoing coronary artery bypass grafting, relief is available for typical post-operative phase syndromes: cardiac, poststenoticescuu, respiratory, hemorheological, psychopathological, geodinamicheskogo and metabolic (Mal, Kharitonov et al., 2018). Made more pronounced effect in the experimental group should be linked here optimizing complex effects on the brain, musculoskeletal system and hemodynamics of patients (Makhov et al., 2018a). The simultaneous use of all elements of the author's rehabilitation has achieved a high result is not simply due to the summation effects of all components of the rehabilitation and development of vzaimoponimanija their actions (Glagoleva et al., 2018; Vorobyeva et al., 2019).

Apparently, the advantage of the developed scheme of rehabilitation is determined by the use it health tourism, implemented in Nordic walking. The use of these components of rehabilitation led to the development of in patients the rapid increase in exercise capacity with the activation of regenerative processes in all organs of the body and primarily in the heart and blood vessels (Medvedev et al., 2007a). Under this option actively the rehabilitation of most muscle, spend a maximum of calories than when dosed walking. In addition, during the proposed rehabilitation of the removed load from the joints of the legs, and minimizes them the impact (Medvedev, 2019).

Thanks to the combination of health tourism and Nordic walking, adaptation to physical activity is accelerated, as a result of which it is easier to tolerate, and positive changes in hemostasis and blood rheology also occur. This is manifested by functionally beneficial biochemical, morphological and functional changes in the muscles, in the cardiovascular system and in most neurons (Makhov et al., 2019). Strengthening in the body of patients who underwent coronary artery bypass grafting, aerobic metabolism increases their mood, accelerates the general restoration of physical abilities, leading to their reliable return to their normal lives due to the approximation of all indicators considered by them to the level of clinically healthy volunteers.

CONCLUSION

For patients who underwent coronary artery bypass grafting, a general weakening of the body and the cardiovascular system is characteristic. The use of the traditionally used physical rehabilitation scheme, including therapeutic physical culture, training on

simulators, physiotherapy and massage is not able to provide a quick and pronounced healing effect in such patients. The proposed method of physical rehabilitation of patients who underwent coronary artery bypass grafting, based on health tourism and including elements of therapeutic exercises with breathing exercises and Nordic walking, turned out to be much more effective than the traditional healing scheme.

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