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REHABILITATION OF ARTERIAL HYPERTENSION DISEASE

Abstract: The article describes a differentiated program of physical rehabilitation at the outpatient stage for patients with hypertension and assesses its effectiveness. Including all elements of gymnastics in the training, swimming for therapeutic purposes, autogenic training, moderate walking, and the use of therapeutic massage contribute to normalizing heart rate, lowering blood pressure, improving overall well-being, and increasing the physical performance of patients.

Keywords: hypertension, therapeutic gymnastics, physical rehabilitation.

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ARTERIAL GIPERTONIYA KASALLIGI REABILITATSIYASI

Annotatsiya: Maqolada gipertoniya kasalligi bilan og'riqan bemorlarni ambulatoriya sharoitida jismoniy reabilitatsiya qilishning tabaqalashtirilgan dasturi tavsiflanadi va uning samaradorligi baholanadi. Mashg'ulotlarga gimnastikaning barcha elementlarini, davolash maqsadida suzishni, autogen mashqlarni, mo'tadil yurishni va davolovchi massajni kiritish yurak urish tezligini me'yorlashtirish, qon bosimini pasaytirish, umumiy ahvolni yaxshilash va bemorlarning jismoniy ish qobiliyatini oshirishga yordam beradi.

Kalit so'zlar: gipertoniya, davolovchi gimnastika, jismoniy reabilitatsiya.

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РЕАБИЛИТАЦИЯ АРТЕРИАЛЬНОЙ ГИПЕРТОНИИ

Аннотация: В статье описывается дифференцированная программа физической реабилитации на амбулаторном этапе для пациентов с гипертонией и оценивается ее эффективность. Включение в тренировку всех элементов гимнастики, лечебного плавания, аутогенной тренировки, умеренной ходьбы и применение лечебного массажа способствуют нормализации частоты сердечных сокращений, снижению артериального давления, улучшению общего самочувствия и повышению физической работоспособности пациентов.

Ключевые слова: гипертония, лечебная гимнастика, физическая реабилитация.

Cardiovascular diseases and among them hypertension are the most common. From the second half of the 20th century, cardiovascular diseases began to take precedence among the most common fatal diseases: coronary heart disease (CHD), angina pectoris, coronary insufficiency, myocardial infarction, and stroke (11).

Studies conducted in developed countries over the past 20 years show that arterial hypertension is the most common disease, occurring in 20-25% of the population (among people over 65 years of age, it reaches 50% or more). Currently, hypertension is very common, especially in adults. Different authors cite heterogeneous data on the frequency and prevalence of hypertension (15-41%).

It was found that people with hypertension make up 15-36% of the adult population. High blood pressure often leads to disability and death. Arterial hypertension underlies the disease.

Hypertension (hypertension) is a chronic disease that affects various systems of the body and is characterized by excessive blood pressure, the most common disease of the cardiovascular system. Arterial hypertension (AH) is the most important risk factor for major cardiovascular diseases - myocardial infarction and stroke, and largely determines the high mortality rate worldwide. Every year, up to 15 million people suffer from stroke, of which 1/3 die (16).

The development of arterial hypertension is determined by many interacting hemodynamic, neurohumoral, metabolic, as well as socio-economic factors (8). A condition that begins as a functional disorder in most people leads to sequential damage to specific organs through various pathogenetic pathways, transforming from a risk factor into disease (21).

Arterial hypertension is an important factor in the disability and mortality of the adult population. In world medical science, great attention is paid to the study of the causes and consequences of increased arterial blood pressure, the development of measures for the prevention and treatment of this disease. A modern approach to the treatment of arterial hypertension is based on the introduction of antihypertensive drugs. However, any drug is a chemical substance that can cause various reactions in the body and is potentially dangerous to health (17).

The problems of treatment, rehabilitation, and prevention of hypertension have always been at the center of attention of therapists, cardiologists, psychotherapists, rehabilitation specialists, and other specialists of healthcare and therapeutic physical education bodies. Physical rehabilitation plays an important role in the treatment of this disease (14). Treatment of hypertension begins with medication and physical therapy is used only when blood pressure drops. Physical rehabilitation in hypertension has a large arsenal of means that actively affect the functional systems of the patient's body: physical therapy, occupational therapy, therapeutic massage, physiotherapy, reflexotherapy. Measures for timely and adequate activation of patients with the help of dosed physical loads that affect the cardiovascular and respiratory systems, contribute to the training and strengthening of the circulatory system, in turn, contribute to increasing tolerance to physical exertion and thereby restore the physical work capacity of patients with hypertension (10). It should be remembered that hypertension is not only an increase in arterial pressure, but also a whole complex of changes in the body's organs and systems. Therefore, the rehabilitation of such patients is very relevant (14). Due to

the insufficient effectiveness of drug treatment, drug-free treatment of arterial hypertension has been developing recently. Therapeutic physical education (TMF) tools used in the treatment process are being widely implemented, as they compensate for the lack of motor activity of a modern person. It is necessary to include therapeutic physical education in the treatment program for patients with hypertension for the speedy restoration of health and work capacity. There is a lot of information in the literature devoted to the rehabilitation of patients with hypertension, but there is no differentiated approach to the application of therapeutic physical education, taking into account the functional state of the disease, the circulatory system, and the respiratory system (17).

Due to the widespread prevalence of hypertension, there is a need for constant improvement of the means, forms, methods, and techniques of therapeutic physical education and therapeutic massage (21). The use of DJT means and forms is one of the rational and effective ways of treating hypertension. It is known that physical exercises have a positive effect on the whole body and its functions, metabolism, and the patient's psyche, which is especially important in the treatment of hypertension.

This work is devoted to the application of therapeutic physical education in the complex restorative treatment of patients with hypertension. Based on the study of various literary sources, we have developed recommendations for the differential prescription of drugs and forms of DHL in hypertension (10).

Therapeutic physical education increases the general adaptive capabilities of patients, their resistance to various stressful influences, improves mental relaxation and emotional state, develops physiological functions and motor qualities, increases mental and physical work capacity. Activation of the motor mode improves the functions of the circulatory regulation systems, improves the contractility of the myocardium and blood circulation, reduces the level of lipids and cholesterol in the blood, promotes the development of collateral vessels, reduces hypoxia, which ultimately prevents and eliminates the manifestation of most risk factors for arterial hypertension (28).

A characteristic feature of physical rehabilitation in patients is initially a low functional state, therefore, with inadequate loads, they may also develop signs of overload, manifested by a decrease in tolerance to repeated load tests (16). Since the shift of autonomic balance towards sympathetic activation can be one of the early signs of FT inadequacy (10), it is logical to use this approach to monitor the effectiveness of rehabilitation measures in patients (11). For these purposes, assessment of heart rate variability (HRV) is used both during 24-hour monitoring of electrocardiography (ECG) and in short recordings (16), but these methods are not widely used in practice. Therefore, attempts to simplify the analysis of the vegetative state of patients using automated methods for assessing HRV appear attractive. In recent years, there has been an increased interest in exercises in an isometric mode (static exercises) in patients with hypertension. The hypotensive effect of static loads is associated with their positive effect on vegetative centers and a subsequent depressor reaction. Thus, an hour after performing such exercises, the blood pressure decreases by more than 20 mm Hg. Isometric exercises are performed in a sitting or standing position, which include holding dumbbells (1-2 kg), medicine balls, and other objects with extended arms. Isometric exercises are necessarily accompanied by voluntary muscle relaxation and breathing exercises.

Usually, loads are applied to the muscles of the arms, shoulder girdle, torso, legs, less often to the muscles of the neck and abdomen. After several months of training, patients with borderline hypertension and stage I of the disease can switch to physical education, swimming, health-improving running, some sports games in health groups with constant normal blood pressure, and continue to use muscle relaxation exercises. In stage II hypertension A and B, the nature of the rehabilitation effect and the conditions for its implementation (polyclinic, inpatient, or sanatorium) depend on the patient's condition, the severity of existing complications, and the degree of adaptation to physical activity. At this stage, special exercises, in particular, muscle relaxation exercises, occupy a large specific weight. Massage and self-massage are given more attention, especially in the collar area. Measured walking, swimming, moderate bicycle ergometric load, terrenkur, games, autogenic training are necessary and sufficiently effective.

The positive effect of rehabilitation programs manifests itself in a change in vegetative balance with an increase in the tone of the parasympathetic nervous system, and long-term physical training (LTR) has the same effect (5-7). At the same time, negative changes in the body's condition are accompanied by sympathetic activation, there is a correlation of vegetative balance indicators with risk factors for cardiovascular diseases (8), damage to target organs in arterial hypertension. Such changes may be manifestations of functional overloads in athletes in JM (4), reaching their peak with the development of overtrainedness. One such method is the ORTO Expert system, which assesses changes in HRV during an active orthostatic test (APT) and subsequently provides an automated conclusion about the type of adaptation of the subject. This method was tested in dynamic observation of healthy adolescents. Despite the fact that there is data on the use of this system in patients with coronary heart disease (CHD) (17), the possibilities of assessing the effectiveness of rehabilitation measures in cardiological patients have not yet been studied. A comprehensive program, including regular classes at the School of Health, is a clinically effective method of therapeutic, preventive, and rehabilitation measures for patients with AH. Dynamics of hemodynamic parameters in patients with AH is characterized by a decrease in the average level of SBP and DBP, an improvement in the results of the load test: an increase in the indicators of maximum aerobic load and the time of onset of the anaerobic metabolic threshold. Significant, pronounced changes in the indicators of patients with AH and MS are manifested 6 months after the start of rehabilitation measures, especially in the group of individuals who regularly attended classes at the School of Health. The positive effect of complex rehabilitation, including classes in the health school, is stable and persists for the next 6-8 months.

The use of physical rehabilitation in outpatient settings allows patients with AH to more effectively achieve the target level of blood pressure and combat negative behavioral PR (excess body weight, sedentary lifestyle) compared to isolated drug therapy (3). In our study, the effectiveness of physical exercises in patients with AH was proven, with the most pronounced positive dynamics observed in cardiac training using cyclic simulators.

The work consists in the fact that, based on the conducted research, a comprehensive physical rehabilitation program for patients with arterial hypertension has been developed and scientifically substantiated. The program is available and easy to implement, requiring only cyclic and strength training, which gives the methodology a competitive advantage over similar programs using

hypotensive agents, physiotherapy procedures, and massage (15). The obtained data can be used in sports and recreation centers, fitness clubs, polyclinics, sanatoriums, and medical institutions working with patients with hypertension. In the rehabilitation of patients with hypertension, especially outdoor therapeutic exercises play a significant role. The influence of climatic factors, the picturesque landscape of the area, combined with the direct influence of physical activity, allows achieving a positive result. In patients with hypertension, during training, the strength and mobility of nervous processes increase, the general tone of the body improves, excitability decreases, and neurotic manifestations are eliminated. Rehabilitation with the help of physical therapy in hospitals, polyclinics, as well as in resort conditions, is aimed at teaching patients with hypertension an active lifestyle, training them in various gymnastic exercises that they can perform at home. The influence of climatic factors, the picturesque landscape of the terrain, combined with the direct influence of gymnastic exercises, allows achieving a positive result.

In patients with hypertension, during training, the strength and mobility of nervous processes increase, the overall tone of the body improves, excitability decreases, and neurotic manifestations are eliminated (23). In resort conditions, physical therapy is also aimed at teaching patients with hypertension an active lifestyle, training them in various gymnastic exercises that they can perform at home. A pronounced positive effect is observed in the long term and regularly, especially with the use of oral hygiene therapy in outpatient settings. Sanatorium-resort treatment allows for a significant improvement in the general condition of patients with hypertension, a decrease in blood pressure, and a favorable basis for further therapy in outpatient settings. As recovery progresses, some treatment methods are limited or excluded, and the proportion of DJT increases. By engaging in physical exercises, the patient actively participates in the treatment and recovery process, which positively affects their psycho-emotional sphere. Training also has educational value: the patient becomes accustomed to regular physical exercises, which becomes their daily habit. Physical therapy sessions transition into general physical education classes, which become a person's need after recovery. With the help of medical and physical rehabilitation, the patient finds the strength to quit alcohol and smoking, turn to sports, physical education, and a healthy lifestyle. During the recovery process, he turns to fewer and fewer medications, prefers walks in fresh air, swimming, and hardening. Angelo Mosso said that exercise can replace many medicines, but no medicine in the world can replace exercise. It should not be forgotten that DJT belongs to the category of potent agents, which, like other treatment methods, are strictly dosed and must be monitored by a doctor. Only a doctor who knows the patient's condition and the characteristics of their illness can accurately determine the amount and nature of the physical load (10). After a hypertensive crisis, it is necessary to return to normal work and daily life and continue exercising the body. Clinical experience shows that if relatives and close ones regularly engage in therapeutic exercises with the patient and encourage the patient, the recovery process will proceed faster and more qualitatively. The family can help maintain a proper daily routine and nutrition, and develop a new life stereotype. In stages I and IIA of hypertension, they are treated in balneological, climatological, and local cardiological sanatoriums. The most favorable season for patients with hypertension is spring, summer, and autumn. For each patient, it is necessary to choose the optimal set of therapeutic procedures. Aerotherapy (sleeping

outside the room, on the seashore), outdoor DJT, terrenkur, balneotherapy, baths, massage, electrical sleep, therapy with a sea climate, and bathing in combination with sunbathing are used.

Autogenic training, a special diet, and a proper daily routine are also used. Massage is indicated as a treatment method in stages I and II of hypertension. In stage III hypertension, massage begins to be used only in the hospital during the semi-bed or free regime stage. Section 5 describes the main methods of massage in hypertension.

The effectiveness of treatment is determined by the mandatory combination of various rehabilitation measures, such as therapeutic physical education, drug therapy, physiotherapy, occupational therapy, and psychological correction. Only various combinations of the listed methods, flexible variation of treatment depending on the current tasks of a certain recovery stage, allow for the implementation of optimal rehabilitation.

No matter how perfect medicine is, it cannot cure a person of all diseases. It is necessary to lead an active lifestyle, strengthen oneself, engage in physical culture and sports, observe personal hygiene rules, and achieve true harmony of health through rational means. Experienced psychotherapists can inspire the patient to overcome physical weakness and depression. A recovering person must overcome a lack of confidence in their abilities.

Based on the foregoing, showing the social and economic significance of arterial hypertension in modern society, therapeutic physical education appears as the most promising non-medicinal means of treating this disease.

References:

1. Golovunina I.S. New approaches to physical rehabilitation programs using strength training equipment for hypertensive disease / I. S. Golovunina, S. N. Popov, F. Yu. Mukharlyamov // Doctor.Ru. - 2010. - No. 8. - P. 13-17. (In Russian)
2. Drapkina O.M. Stroke Prevention / O. M. Drapkina, Ya. I. Ashikhmin, V. T. Ivashkin // Russian Medical News. - 2017. - No. 4. - P. 60-75. (In Russian)
3. Dubrovsky V.I. Therapeutic Exercise and Medical Supervision [Text]: textbook for medical university students / V. I. Dubrovsky. - Тошкент, 2016. - 598 p. (In Russian)
4. Epifanov V.A. Therapeutic Physical Culture [Text]: textbook / V. A. Epifanov. Moscow: GEOTAR-Media, 2009. - 568 p. (In Russian)
5. Epifanov V.A. Therapeutic Physical Culture and Sports Medicine. Moscow: Medicine. (In Russian)
6. Ibatov A.D. Fundamentals of Rehabilitation [Text]: textbook / A. D. Ibatov, S. V. Pushkina. Moscow: GEOTAR-Media, 2017. - 160 p. (In Russian)
7. Kiselev A.R., Shvarts V.A., Posnenkova O.M. et al. Prevention and treatment of arterial hypertension in outpatient studies using mobile phone communication and internet technologies. Therapeutic Archive 2011; 4: 46-52. (In Russian)
8. Lanfan K. Blood Pressure: What progress have we made in lowering it? Therapeutic Archive 2009; 5: 47-50. (In Russian)
9. Martirosov E.G. Technologies and methods for determining human body composition / E. G. Martirosov, D. V. Nikolaev, S. G. Rudnev. - Тошкент, 2016. - P. 50-53. (In Russian)

10. Medical Rehabilitation [Text]. In 3 vols. Vol. 1 / ed. V. M. Bogolyubov. Moscow: [s.n.], 2007. - 678 p. "Economics and Society" No. 10 (77) 2020 www.iupr.ru 472 (In Russian)
11. Ostroumova O.D., Ishchenko K.A. Treatment of arterial hypertension in outpatient settings: clinical and economic effectiveness. *Consilium Medicum* 2007; 5: 19-24. (In Russian)
12. Rehabilitation for Cardiovascular Diseases [Text] / edited by I. N. Makarova. Moscow: GEOTAR-Media, 2010. - 304 p. (In Russian)
13. Health promotion and disease prevention (main terms and concepts). Edited by R.G. Oganov, A.I. Vyalkov. Moscow 2010. (In Russian)
14. Chazova, I.E., & Mychka, V.B. *Metabolic Syndrome*. Moscow: Media-Medica. (In Russian)
15. Roy B.A. Exercise and Hypertension. American Council on Exercise. Fitness Symposium 2011.
16. Acute heart rate, blood pressure, and RPE responses during Super Slow Vs. traditional machine resistance training protocols using small muscle group exercises / P. J. Wickwire, R. J. Mclester, J. M. Green, R. T. Crews // *Strength Cond Res.* - 2009. - Vol. 23, N 1. - P. 72-79. "Economics and Society" No10 (77) 2020 www.iupr.ru 473
17. Soykher V.M., Mineeva T.N. Results of a survey to determine the level of public awareness about risk factors for arterial hypertension. Evaluation of the quality of health schools // *Health. Medical Ecology. Science.* 2011. No. 2 (45). P. 7-12. (In Russian)
18. World Health Organization. Cardiovascular Diseases (CVDs) (World Health Organization). Available at: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)) [Accessed 26-06-2019]. [Google Scholar] (In Russian)
19. Martinet W. et al. Macrophage death as a pharmacological target in atherosclerosis // *Frontiers in pharmacology.* - 2019. - Vol. 10. - P. 306.
20. Jessup M. The heart failure paradox: an epidemic of scientific success: presidential address at the American Heart Association 2013 scientific sessions // *Circulation.* - 2014. - Vol. 129. - No. - P. 2717-2722.
21. Davidson M. H., Toth P. P. High-density lipoprotein metabolism: potential therapeutic targets // *The American journal of cardiology.* - 2007. - Vol. 100. - No. 11. - P. C32-C40.
22. Reiner J. et al. The year in cardiology 2018: prevention // *European Heart Journal.* - 2019. - Vol. 40. - No. - P. 336-344.
23. Ridker P. M. et al. Anti-inflammatory therapy with canakinumab for atherosclerotic disease // *New England journal of medicine.* - 2017. - Vol. 377. - No. 12. - P. 1119-1131.
24. Aday A. W., Ridker P. M. Anti-inflammatory therapy in clinical care: the CANTOS trial and beyond // *Frontiers in cardiovascular medicine.* - 2018. - Vol. 5. - P. 62.
25. Maguire E. M., Pearce S. W. A., Xiao Q. Foam cell formation: A new target for fighting atherosclerosis and cardiovascular disease // *Vascular Pharmacology.* - 2019. - Vol. 112. - P. 54
26. Smolen J. S. et al. NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4.4 million participants. *Lancet*, 2016. 387: 1513-30 - In this article, Catherine Pelletier. - 2016.
27. Khudoykulova, F. V. (2024). The importance of diet therapy and physical activity in the treatment of non-alcoholic fatty liver disease. *Science and Education*, 5 (9), 54-63. (Uzb)

28. Khudoykulova, F. V., & Kalonov, S. S. (2024). Assessment of bile acid circulation in the liver and intestines in non-alcoholic fatty liver disease. *Science and Education*, 5 (3), 125-133. (Uzb)
29. Matmurodov R., Egamova M. Evaluation of clinical aspects of rehabilitation of children with cerebral palsy // *Journal of Neurological Sciences*. - 2021. - T. 455.
30. Ibragimova m. Children's cerebral paralysis. Risk factors, rehabilitation characteristics (literature review) // *journal of experimental studies*. - 2021. - vol. 2. - no. 3. - p. 9-19.
31. Tursunovna e. M. Et al. Effectiveness of parental participation in the rehabilitation of patients with cerebral palsy // *journal of interdisciplinary innovations and scientific research in uzbekistan*. - 2021. - vol. 3. - no. 28. - p. 220-226.
32. Khudoykulova, F. V. (2024). Assessment of the effectiveness of diet therapy with the addition of a special food product in the treatment of non-alcoholic steatohepatitis. *Science and Education*, 5 (9), 38-53. (Uzb)

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