

Advances in the Study of Exercise Compliance in Essential Hypertension

Ruochen Jiang¹, Hui Zhang², Jie Rong², Yongmei Yan², *

1. Shaanxi University of Traditional Chinese Medicine, Xianyang 712046, China

2. Affiliated Hospital of Shaanxi University of Chinese Medicine, Xianyang 712000, China.

Abstract: Hypertension remains an important risk factor for death from cardiovascular disease to date, and prevention and control of hypertension has become a core strategy to curb the epidemic of cardiovascular disease. A large number of domestic and international studies have fully demonstrated that exercise therapy can ideally control hypertension and delay the progression of hypertensive disease, while improving the health status of patients and Therefore, exercise therapy has become one of the most important tools in the six-part process of antihypertensive However, most studies have shown that the current status of exercise in hypertensive patients is not optimistic, and the problem of low adherence to exercise needs to be addressed. Therefore, this paper describes the factors influencing exercise compliance and interventions in patients with essential hypertension, aiming to summarize the experience of exercise for hypertensive patients, improve their exercise compliance, and control hypertension more effectively.

Keywords: Essential Hypertension; Exercise Therapy; Exercise Compliance; Integration of Sports and Medicine

Introduction

The latest data from the China Cardiovascular Health and Disease Report 2021 shows that the number of people with hypertension in China has reached 245 million, and the number of people with normal high blood pressure has reached 435 million^[1]. Compared with previous surveys^[2], the overall trend of prevalence is increasing. Blood pressure levels have a continuous, independent and direct positive correlation with cardiovascular risk, often causing serious events such as myocardial infarction and stroke, and remain an important risk factor for cardiovascular mortality to date. According to studies, for every 10 mmHg reduction in systolic blood pressure (1 mmHg = 0.133 kPa), or 5 mmHg reduction in diastolic blood pressure, patients can reduce their risk of death by 10%-15%, stroke risk by 35%, coronary heart disease risk by 20%, and heart failure risk by 40%^[3]. Therefore, effective prevention and treatment of hypertension has become one of the major strategies to curb the epidemic of cardiovascular and cerebrovascular diseases in China.

A large number of scholarly studies have fully demonstrated that exercise therapy can ideally control hypertension and delay the progression of hypertensive disease, while improving the health status of patients and improving the quality of life^[4]. Therefore, exercise therapy has become one of the top six components of a healthy lifestyle for lowering blood pressure. The Guidelines for the Primary Care of Hypertension 2019 states^[5] that in addition to activities of daily living, moderate intensity aerobic exercise (e.g. walking, jogging, cycling, swimming, etc.) is recommended for patients with hypertension for 4-7 d per week for a total of 30-60 min per day, and can be combined with resistance exercise in moderation. However, despite the exercise recommendations of relevant guidelines, the current status of exercise in hypertensive patients is still not optimistic due to the long-standing lack of awareness of the harmful effects of hypertension. A foreign study on the correlation between physical activity patterns and blood pressure levels showed^[6] that people with hypertension are more physically inactive than those without hypertension, and it is also estimated that by 2025, up to 30% of adults worldwide will have hypertension, and the likelihood of physical inactivity will continue to increase^[7]. In China, a literature review by

Wenyan Zhang et al.^[8] on the prevalence and self-management of hypertension in low-income populations indicated that the proportion of hypertensive patients in low-income areas who were physically active was only 11.3%. After Zhou Jianhong et al.^[9] analyzed the current status of self-management of 658 hypertensive patients in Jinshan District, Shanghai, it was found that up to 58.9% of hypertensive patients had no regular exercise habits. The exercise adherence of patients varies between regions due to factors such as economic level and education, but overall the current exercise adherence of hypertensive patients in China is poor, and the problem of low patient exercise adherence needs to be addressed. Therefore, this paper focuses on the factors influencing exercise adherence and interventions for patients with essential hypertension, aiming to summarize the experience of exercise for hypertensive patients, improve their exercise adherence, and control hypertension more effectively.

1. Factors affecting exercise compliance in hypertensive patients

1.1 Disease awareness

Hypertension as a chronic disease, in the public perception often belongs to the category of "can not be cured, can not die", especially in the majority of hypertension patients do not have any discomfort symptoms, did not attract sufficient attention. Data survey shows that the awareness rate, treatment rate and control rate of hypertension in China are 51.5%, 46.1% and 16.9% respectively, which are at a low level, of which only 15.3% can manage their blood pressure up to the standard^[5]. Most hypertensive patients have the idea that medical treatment is more important than physical treatment, and believe that they only need to adhere to medication after the disease. In fact, medication should be based on a healthy lifestyle, and both are indispensable, and many people have poor blood pressure control precisely for this reason. Sun Kaige et al.^[10] analyzed the factors influencing exercise in 879 cases of hypertensive patients in Shunyi District, Beijing, and concluded that the more educated people are, the more comprehensive their disease awareness is, the higher their awareness of the relationship between exercise and health, and the higher their disease management behavior. The findings of Sun Yudan et al.^[11] showed that patients' exercise compliance and blood pressure compliance rates were significantly improved after they correctly perceived the disease, understood the treatment plan, and understood the purpose of exercise.

1.2 Mechanism of integration of sports and medicine

The "Health China 2030" planning outline for the first time put forward the "integration of sports and medicine", while adhering to the concept of whole life cycle services, clearly strengthen the integration of physical medicine and non-medical health interventions. Subsequently, the national policy further encourages medical units at all levels to open exercise for health guidance services^[12], promote the construction of exercise prescription library, and promote the in-depth integration of national fitness and national health. However, because the mechanism of sports-medicine integration in China has not yet been perfected, there is still a split management mode of "sports for sports" and "medicine for medicine"^[13], coupled with a serious shortage of professional talents for sports-medicine integration, the number of medical experts and sports instructors with the ability to issue sports prescriptions is too small, leading to the lack of sports prescriptions. The shortage of medical professionals and the number of medical experts and sports instructors with the ability to prescribe sports is too small, which may lead to inaccurate sports prescriptions, single types of sports, unscientific sports intensity, and loopholes in sports safety protection, making the construction of sports prescriptions slow to advance, so the situation of "doctors do not understand sports and sports do not understand medicine" still exists in various regions.

1.3 Social environment support

Social environment support mainly refers to the hardware and software facilities required for exercise as well as the support of patients' family members, close friends, neighbors and other people with close relationships. As China is currently in the transition stage of "integration of sports and medicine" to "integration of sports and health", the public service

measures for national fitness are still insufficient^[14], and there is a lack of fitness venues and fitness equipment, resulting in patients having to choose community parks and other places when exercising. In addition to the lack of professional sports equipment, patients prefer walking, running and other single sports without relying on equipment when choosing sports. In addition, some fitness facilities have certain exercise conditions, but they are often closed to the public and lack corresponding medical equipment. In addition, the prevention and treatment of hypertension requires a high level of diet, exercise and lifestyle habits, especially exercise as one of the key aspects of disease prevention and treatment, and without the support and encouragement of family members and close friends^[15], it is often difficult for patients to increase their motivation to exercise and achieve an effective reduction in the prevalence of hypertension.

1.4 Supervision mechanism

Supervision refers to medical supervision during the exercise process. Because of the greater autonomy of the patient's choice of exercise, patients often lack effective communication with medical workers when exercising according to exercise prescriptions, resulting in patients not systematically grasping the correct exercise methods and failing to achieve the purpose of disease prevention and control, thus losing confidence in medical workers and even exercise, and compliance declines quickly.

2. Interventions

2.1 Change the mind and establish the correct concept of disease perception

Since patients' perceptions of the disease can directly or indirectly affect their treatment behaviors, it is particularly important to popularize knowledge about hypertension and conduct health education. Health education based on the transtheoretical model (TTM) has been widely used in the care of hypertensive patients. He Shuping^[16] et al. summarized the current status of research on the transtheoretical model in the care of hypertensive patients in China and found that the transtheoretical model Type interventions enhance patients' awareness of disease severity by giving them targeted guidance, help them establish good life patterns, and improve their exercise adherence. For some patients with low literacy and relatively poor comprehension, learning and memory abilities, it is more important to pay attention to patients' feedback on health education information. Hou Xiaoli^[17] et al. found that when 50 hypertensive patients were given feedback health education based on the WeChat platform, patients' awareness of the disease was better than unilateral conventional education. Therefore, it is important to strengthen the targeted education of hypertension disease and establish the correct cognition of hypertension disease in patients to improve their exercise compliance, better control blood pressure and delay the disease progression.

2.2 Improve the mechanism of integration of sports and medicine

As a new trend in disease prevention and treatment, the integration of sports and medicine, as an important element in the construction of a healthy China and a strong sports country, still faces many difficulties in the construction of institutional mechanisms^[18]. At present, the split management model of "sports for sports" and "medicine for medicine" is still in place, and the lack of sports experts in the medical field and the weakness of sports intervention in diseases have seriously hindered the development of sports-medicine integration. Therefore, it is urgent to break the mechanism barriers, refine the operation system led by the government, the community, medical units, sports research centers to participate in multiple subjects, and improve the allocation of resources in the process of integration of sports and medicine to ensure. Especially in terms of human resources, we can apply "community health service team + social sports knowledge", "social sports work team + medical knowledge", "medical-related profession + social sports knowledge", "social sports-related professional + medical knowledge" four models^[19] to carry out sports-medical combination of composite talent training,

establish a professional qualification certification system, promote the construction of sports prescription library, and realize the perfect integration of medical resources and sports resources.

2.3 Create a supportive social environment

The healthy development of physical medicine integration requires the implementation of various safeguards. The guarantee of venue and facility resources directly affects the feasibility of exercise for patients. In response to social security problems such as restricted exercise venues and insufficient equipment, it is necessary to reintegrate community resources^[20], reasonably allocate exercise and fitness venues, and renovate and upgrade hardware facilities in the community under the guidance of professionals. Also strengthen the deep integration of artificial intelligence and exercise^[21], through cell phone APP, website, etc., to push patients nearby continuously open and well-equipped exercise places and exercise teaching videos, etc., to guide patients to develop good exercise habits. Another important part of establishing a supportive social environment is to enlist the support of patients' families and close friends. Support from family and peers is crucial to disease management^[22-23]. By providing health education to the patient's close group, family members and close friends can fully participate in exercise so that patients can harvest more encouragement from their families, which helps to provide emotional support for patients, improve their self-management ability and motivation to exercise, and fully improve the quality of life of hypertensive patients.

2.4 Strengthening medical supervision

Medical supervision, as an important part of the integration of physical medicine, can more effectively intervene in the prevention and treatment of diseases by monitoring the health and function of patients and ensuring the smooth implementation of exercise training to achieve the purpose of lowering blood pressure^[24]. During the supervision process, patients are first assessed by physical examination, and then a practical and personalized exercise program is proposed. The type of exercise, time, intensity, frequency, and exercise precautions should be explained in detail when the patient exercises to try to avoid adverse events during the exercise process. At the same time, the exercise diary should be used to track the patient's exercise and help the patient to develop the habit of self-monitoring. With the long-term efforts of both doctors and patients, it will not only enhance doctor-patient trust, but also enable patients to develop a scientific approach to exercise, obtain good antihypertensive effects, and ultimately promote disease recovery.

3. Summary and outlook

In summary, with the continuous development and progress of the times, people's disease prevention and treatment of hypertension has not only been limited to medication, but also exercise as one of the effective means to lower blood pressure is slowly gaining more and more attention. However, due to the above factors, the current situation of exercise in hypertensive patients is not optimistic, and there are many problems that need to be solved. There is a lack of research on exercise adherence in hypertensive patients, and future research can be based on our national policy, analyzing more influencing factors, and formulating effective, personalized, and targeted interventions to address the problems and eliminate hindering factors in a timely manner, so as to improve exercise adherence in hypertensive patients.

References

- [1] China Cardiovascular Health and Disease Report Writing Group. Summary of the China Cardiovascular Health and Disease Report 2021[J]. Chinese Journal of Circulation, 2022, 37(6):553-578.
- [2] Wang ZW et al. Status of Hypertension in China: Results From the China Hypertension Survey, 2012-2015[J]. Circulation, 2018, 137(22): 2344-2356.
- [3] Williams B, Mancia G, Spiering W, et al. 2018 ESC/ESH guidelines for the management of arterial hypertension [J]. Eur Heart J, 2018, 39(33): 3021-3104.

- [4] Liu X, Zhang D, Liu Y, Sun X, Han C, Wang B, Ren Y, Zhou J, Zhao Y, Shi Y, Hu D, Zhang M. Dose-response association between physical activity and incident hypertension: a systematic review and meta-analysis of cohort studies. *Hypertension* 2017;69:813-820.
- [5] Chinese Medical Association, Chinese Medical Journal Society, Chinese Medical Association General Practice Branch, et al. Guidelines for primary care of hypertension (2019) [J]. *Chinese Journal of General Practitioners*, 2019, 18(4):301-313.
- [6] Churilla JR, Ford ES. Comparing physical activity patterns of hypertensive and nonhypertensive US adults[J]. *Am J Hypertens*, 2010, 23:987-993.
- [7] He L and Wei WR and Can Z. Effects of 12-week brisk walking training on exercise blood pressure in elderly patients with essential hypertension: A pilot study.[J]. *Clinical and experimental hypertension (New York, N.Y. : 1993)*, 2018, 40(7) : 1-7.
- [8] Zhang WY, Liu Y, Zhang M. Research progress on the current status of hypertension prevalence and self-management among low-income people[J]. *Journal of Nursing*, 2020, 27(6):12-16.
- [9] Zhou JH, Chen W, Shen F. Analysis of the current situation of self-management of hypertensive patients aged 35-59 in Langxia Town, Jinshan District, Shanghai[J]. *Wisdom Health*, 2021, 7(16):187-190.
- [10] Sun KG, Zhang XXX, Wu SY. et al. Applying the health belief model to explore exercise and exercise behavior and its influencing factors in hypertensive patients[J]. *China Health Education*, 2016, 32(05):414-418.
- [11] Sun YD, Yang L, Liu J, et al. Impact of behavioral lifestyle on quality of life in rural hypertensive patients[J]. *China Rural Health Care Management*, 2020, 40(8):594-598.
- [12] Li J, Li ZH. The development dilemma and countermeasures thinking of China's corporal medicine integration in the context of population aging[J]. *Journal of Liaoning Normal University (Natural Science Edition)*, 2022, 45(03):410-416.
- [13] Dong H, Dai J, Yin P. The realistic dilemma and optimization path of the supply-side reform perspective of the supply model of sports and medical integration services[J]. *Journal of Wuhan Institute of Sports*, 2019, 53(9):15-21.
- [14] National Bureau of Statistics. The 70th Anniversary of the Founding of New China Economic and Social Development Achievement Series Report No. 20 [EB/OL]. (2019-08-22)[2020-02-24]. http://www.gov.cn/xinwen/2019-08/22/content_5423308.htm.
- [15] Huang JW. Myths and health education strategies of hypertensive patients and their families[J]. *Chinese and Foreign Medical Research*, 2012, 10(06):153.
- [16] He SP, Lin LP. Current status of research on cross-theoretical models in the care of hypertensive patients in China[J]. *Contemporary Nurse (Upper Journal)* 2019, 26(09):16- 17.
- [17] Hou XL, Hao YY. Effect of feedback-based health education combined with individualized lifestyle guidance on heart rate variability and self-efficacy in elderly patients with essential hypertension based on WeChat platform[J]. *Clinical Medicine Research and Practice*, 2022, 7(30):161-163.
- [18] Shen Z, Hu HQ, Qiu J. Research progress, hot spotlight and future prospect of sports medicine integration in China[J]. *Kinesiology Research*, 2021, 35(1): 9-19.
- [19] Ye CM, Yu SJ, Yang QJ. The training mode and strategy of "physical medicine" composite talents[J]. *Journal of Sports Culture*, 2019(01):7-10+53.
- [20] Zhu H, Zhou LY, Lu YQ. The development model and community path of "health promotion"[J]. *Market Week*, 2020(01):185-188.
- [21] Wang G, Lin L, Qiao FJ. Research on artificial intelligence for the integration of sports and medical care in the context of healthy China[J]. *China Sports Science and Technology*, 2022, 58(10):109-113.
- [22] Pesantes MA, Del Valle A, Diez Canseco F, et al. Family support and diabetes: patient's experiences from a public hospital in Peru. *Qual Health Res*, 2018, 28(12): 1871-1882.
- [23] Dennis C L. Peer support within a health care context: a concept analysis. *Int J Nurs Stud*, 2003, 40(3): 321-332.

[24] Liu Y, Ning L, Zhang JL. Research on the importance of medical supervision in sports training in the context of "Healthy China"[C]. Proceedings of the 7th Guangzhou International Symposium on Sports and Health, 2022: 230-231.

Author: Ruochen Jiang, M.S., Research Interests: Basic and Clinical Research on Cerebrovascular Diseases in Chinese and Western Medicine.

Corresponding author: Yongmei Yan, Professor, Master's degree advisor, Research interests: Basic and clinical research of Chinese and Western medicine cerebrovascular diseases.

Fund project: National Key R&D Program - Research on Scientific Fitness Guidance Service System (No.2020YFC2006904)