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Research Progress of Formulating Exercise Prescription for Type II Diabetes

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ABSTRACT. *Diabetes is a high-risk disease that can cause major harm to patients' physical and mental health. Type II diabetes is a family inherited disease. Severe diabetes can cause many complications of diabetes, and the most serious can be life-threatening. By consulting the relevant domestic research literature, it is found that exercise prescription refers to formulating for patients in line with the cause of the patient and can be used for the patient's pain. The patient's physique should be carefully checked and based on the patient's physical examination data, a specific exercise prescription for the patient should be formulated. Prescription and drug prescription belong to the same principle, so we must prescribe the right medicine to the patient and not blindly judge the patient. Excessive exercise will cause the patient to be harmed. At the same time, if the activity level is too small, the desired effect will not be achieved. The study also found that applying exercise prescriptions to diabetes, formulating unique exercise prescriptions belonging to each patient from resistance exercises, and applying unique exercise prescriptions to disease control can alleviate the patient's condition, and at the same time can enhance the patient's physical fitness.*

KEYWORDS: *type II diabetes, exercise prescription, exercise intensity*

1. Introduction

In modern times, every country attaches great importance to the physical fitness and health of its citizens. Only when a country pays more and more attention to the physical condition of its citizens can it develop faster, and the country will become more prosperous, powerful and prosperous if the people are strong. Especially since the reform and opening up in the 1980s, with the increase of China's comprehensive national strength, the quality of life of the people has gradually improved. At the same time, people's living habits and rhythm of life have also undergone tremendous changes. People have gradually enriched their nightlife and their living habits have become irregular. Medical technology is constantly improving, but the physical fitness of the people is declining. Among them, the problem of type II diabetes is common, which makes the people afraid to hear that type II diabetes is directly related to family inheritance, which is also related to the fast-paced life of modern

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people Inseparable relationship [1].

The onset of type II diabetes is mostly the stage of middle-aged people. During this period, the citizens are the mainstay of the country, which plays a major supporting role and a link between the society and the society. Therefore, the citizens improve their physical functions through their own body changes. This kind of disease speeds up one's own body metabolism at the same time, keeps the body's mechanism stable, and restores one's own health, which can to a large extent show my country's national strength and improve the country's soft power.

Our country is one of the first countries in the world to propose exercise to treat diabetes. In ancient times in my country, medical practitioners realized that diabetic patients should take appropriate exercise. Li Jing, a scholar of the Imperial Palace in the early Sui Dynasty, wrote in "The Theory of the Yuan Hou of Various Diseases": People with diabetes "want to take two hundred steps, then take a thousand steps, and finally eat." In the early 1900s abroad, Bouchard It is proposed and summarized that patients who exercise regularly are relieved much faster than patients who exercise less daily [2]. Lawrence proposed that exercise therapy combined with insulin has a much better effect on lowering blood sugar than insulin alone [3]. In 1935, the well-known diabetician Josling concluded that "exercise is the main way for diabetic people to fight against diabetes and should be a tool for diabetes treatment." At the same time, he put forward the very famous "troika theory", vividly combining food supplements, insulin therapy and exercise compared with the three carriages in ancient times, the method is the three major measures to effectively control diabetes [4]. But he has always believed that physical activity is the most effective method in comprehensive diabetes treatment, and advocated that various activities should be arranged every day. In 1976, the Physical Activity Therapy to Treat Diabetes Council in Texas received widespread attention from a large number of medical experts [5]. Therefore, domestic medical experts have also begun to conduct research on physical activity therapy for type II diabetes. A long-term survey of 500 patients with impaired glucose tolerance in Chongqing showed that the annual incidence of diabetes patients in the exercise treatment group was significantly less than that in the diet group of the control group [6-7]. The WHO issued an announcement in October 2009, warning that countries around the world should raise awareness of diabetes, and at the same time recommended Chongqing's experience in treating diabetes.

2. Type II diabetes

2.1 The concept of type II diabetes

Authoritatively pointed out by my country’s Health and Family Planning Commission on the definition of type II diabetes, type II diabetes was originally called adult-onset diabetes. Most of the disease started after the age of 36-40, accounting for 85% of the patients with diabetes. Many, the insulin production function in patients with type II diabetes has not completely disappeared, or some

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patients will produce more insulin, but the insulin action rate is very low, so the internal insulin of type II diabetes patients is in a state of insufficient, it must take some medicine to promote insulin production in the body. However, in the later stage of the disease, patients with type II diabetes still need to inject insulin to promote the production of insulin in the body for treatment.

2.2 Analysis of the causes of type II diabetes and its harm

Cause analysis: Type II diabetes has many factors that can lead to the disease. At present, it is mainly summarized as five causes:

(1) Genetic factors

The similarity between type II diabetes and type I diabetes is more obvious in both genetics, and both are more obvious in family genetic history. The genes of some of these genetic causes have been determined, and some have not yet been determined and are still in the research stage.

(2) Environmental factors

Through epidemiological investigations, it is found that eating high-calorie foods, lack of physical activity, weight and age are the main external factors for type II diabetes. The appearance of abnormal blood lipids and high blood pressure will also increase the risk of disease.

(3) Race factors

Native Americans, Africans and Hispanics are much more likely to develop type II diabetes than Asians and whites.

(4) Age factor

After 30 years of age, the incidence of type II diabetes has increased significantly. In half of the newly diagnosed type II diabetes patients, the onset stage is over 50 years old.

(5) Lifestyle

The intake of unscientific forms and high-calorie, high-fat, high-protein, and low-carbohydrate foods can lead to excess weight. With weight gain and lack of physical exercise, insulin resistance will continue to increase, which will lead to insulin secretion. Deficiency and the development of type II diabetes.

3. Exercise prescription

3.1 Conceptual analysis of exercise prescription

The meaning of exercise prescription was first proposed by the famous American physiologist Kapović in the 1960s. After the 1960s, with the development of

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rehabilitation medicine and rehabilitation training for coronary heart disease, exercise prescriptions gradually gained attention. Exercise prescription as a treatment method was first used by the World Health Organization in 1968, and has gradually been recognized in various countries.

The method of exercise therapy is formulated according to the method of medical therapy, according to the patient's case, similar to physical test and exercise test. According to the patient's disease type, physical fitness and cardiovascular and cerebrovascular functions, as well as individual characteristics such as the patient's living environment and sports hobbies, the patient's exercise mode, frequency and time are formulated in a form similar to medical prescriptions. At the same time, it is necessary to clearly explain to the patient the matters that the patient needs to pay attention to during exercise in order to carry out systematic exercise and finally overcome the disease.

3.2 Designated elements of exercise prescription

In the exercise therapy formulation process, if you want to develop a complete and feasible exercise prescription therapy, you must have the following four elements:

3.2.1 The form of exercise

The form of exercise can be divided into three categories: anaerobic exercise, aerobic exercise and mixed exercise according to the oxygen consumption and metabolism of exercise [8]. Aerobic exercises are exercises that consume a lot of oxygen. Most of them are exercises involving large muscle groups, such as brisk walking, swimming, jogging, riding, stairs, dancing, aerobics, and Tai Chi. These similar exercises can effectively increase the utilization rate of glucose, burn fat, and enhance cardiopulmonary function; anaerobic exercise is mainly based on the explosive power of the muscles to complete the action, does not consume a lot of oxygen or consumes very little oxygen, similar to a tug of war , weightlifting, jumping, sprinting, throwing, etc [9]. Obviously, this type of exercise is not useful for the metabolism of diabetic patients; there are also mixed exercises that can be understood from the name, this type of exercise includes both aerobic exercise and anaerobic exercise, and most ball all kinds of sports belong to the category of mixed sports.

3.2.2 Intensity of exercise

The effect of exercise is determined by the intensity of exercise. If the intensity is very small, the effect is very small, and it can only comfort your heart. However, if the exercise intensity exceeds the body load, it will increase anaerobic metabolism. Then the therapeutic effect of the exercise prescription will be minimal, and it may cause the body to be overloaded. At the same time, the body's exercise system will

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also be damaged to different degrees. So only when the exercise intensity reaches 50% of the maximum oxygen uptake. The metabolic system and cardiovascular function of the patient can be improved, so when we formulate the exercise treatment plan for the patient, we specify the treatment effect according to 70%-80% of the patient's maximum heart rate to achieve the best state.

3.2.3 Exercise time

Exercise is not as long as possible. It should be determined according to your own situation. At the beginning of exercise, the exercise time is about 10 minutes. Change the time to about 30 to 40 minutes. You can have some necessary rest time during exercise. But the best heart rate during exercise should reach 20-30 minutes. The amount of exercise is determined by exercise time and exercise intensity. The exercise intensity and exercise time must be coordinated with each other. Light exercise is generally maintained about 30 minutes is the best time period, moderate exercise time is generally about 20 minutes, and heavy exercise is generally about 10 minutes.

3.2.4 Frequency of exercise

The number of exercises per week is called exercise frequency. If the exercise time is less than twice a week, the treatment will not be effective. If the exercise frequency is too high, the patient may experience a situation where the body cannot adapt to it. If the number of exercises per week exceeds 5 times, the maximum oxygen consumption will increase very little. If the rest interval of exercise exceeds 3 to 4 days per week, the effect of exercise and the accumulation of exercise will be weakened. Therefore, it is most appropriate for patients to exercise 3 to 4 times a week.

3.3 Precautions for formulation of exercise prescription

3.3.1 Physical examination

For patients who are about to participate in activity therapy to treat diseases, comprehensive examinations must be performed, especially in the examination of heart, liver, lung, kidney, eye, and brain functions. If there are other diseases, exercise prescriptions should be carefully formulated; During the examination, explain to the patient the most basic self-examination methods, such as raising the legs for 15 to 25 times. Observe if there are dizziness, chest tightness, shortness of breath and other similar symptoms, to carry out related self-regulation .

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3.3.2 Test of exercise load capacity

The main purpose of the test is to test and evaluate the patient's ability to withstand exercise [10]. Generally speaking, the test mainly focuses on the cardiopulmonary function, and the physiological function of the quiet and exercise state is detected, mainly with heart rate, blood pressure and vital capacity and other indicators as parameters.

3.3.3 Determination of physical fitness

Check the strength, endurance, agility and speed of the patient, and judge the patient's various physical functions and the range of exercise intensity that can be sustained from the data, and use the patient's test data to formulate a reasonable and feasible exercise for the patient the prescription provides usable data.

4. Formulation of exercise prescription for patients with type II diabetes

Exercise mode is another important part of exercise prescription. The choice of exercise mode is generally determined by the willingness of the participants, their physical condition and the purpose of the exercise prescription. Diabetes patients, especially those who have been ill for a long time, have corresponding complications that limit the choice of exercise methods. Therefore, choose suitable exercise methods for diabetic patients with different conditions so that they can participate in different training methods, which can improve diabetes. The patient's interest in participating in exercise can get better exercise effect. There are currently two main types of exercise options: aerobic endurance exercise and strength exercise.

Most studies believe that skeletal muscle is the main part of insulin resistance. In addition to glycogen conversion, oxidation and storage barriers, insulin resistance muscles have many metabolic abnormalities, and strength exercises can more effectively change bones. Muscle metabolism. In some cases, the benefits of resistance exercise to diabetics are as good as endurance training. These benefits include improving blood lipid status, increasing absolute contractility of the left ventricle, lowering blood pressure at rest, improving insulin sensitivity and glucose tolerance, improving muscle strength and endurance, and increasing bone and connective tissue strength. Therefore, the combined application of aerobic exercise and resistance exercise can provide more effective exercise prescriptions for diabetic patients. Numerous studies have shown that, compared with endurance training, resistance training is better for treating type II diabetes. However, at present, the proportion of people with diabetes in my country who engage in resistance training is very small, which seriously reduces the effect of exercise on reducing blood sugar.

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5. Conclusion

With the increasing incidence of diabetes and the gradual deepening of people's understanding of factors affecting health, changing unhealthy lifestyles has become one of the important strategies to promote health. Scientific exercise as an important part of a healthy lifestyle has also received increasing attention, especially for chronic non-communicable diseases such as diabetes, exercise plays an irreplaceable role. Therefore, on the basis of a comprehensive understanding of the condition, course, and exercise capacity of diabetic patients, choosing exercises that patients love and can last for a long time is an important part of diabetes treatment. Most previous studies recommend low- and moderate-intensity exercise. This article has found through reviewing the literature that high-intensity exercise can help patients with type II diabetes achieve better curative effects. So, for diabetic patients with mild disease and good physical fitness, it is advisable to arrange high-intensity exercise appropriately, which can save exercise time. Regarding the research on the length of exercise duration in diabetic exercise prescriptions, scholars still have some controversies, and further research is needed. However, the determination of exercise time should be determined by combining exercise intensity, exercise frequency and other factors. In addition, resistance training is better than aerobic endurance training in the treatment of type II diabetes, but it has not been widely used in China, and patient compliance is also poor. Therefore, this issue should arouse the attention of sports medicine and diabetes. It should be noted that while exploring the above-mentioned exercise prescription elements, it is also necessary to explore the best exercise prescriptions for different individuals.

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