

The Impact of Cardiac Rehabilitation Exercise on Cardiopulmonary Capacity and Life Quality of the Patients with Myocardial Infarction

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Abstract—In recent years, with social and economic development and the implementation of "nationwide fitness plan", people's needs of fitness activities continue to enhance, study of various exercise prescription has also been developed rapidly and widely applied, there has been a large number of scientific treatises. But the theory and practice about how patients suffering from myocardial infarction with scientific sports prescription to exercise, control and reduce the number of myocardial infarction has been reported. And it is precisely the patients with myocardial infarction are the main object of the promotion and popularization of "Global Myocardial Infarction Prevention Strategy Initiative" (GINA) in our country. Cardiac rehabilitation exercise prescription will influence the patients' cardiorespiratory capacity and quality of life. Rehabilitation exercise prescription has a significant effect on improving and enhancing cardiopulmonary function of the patients with myocardial infarction.

Keywords- Rehabilitation exercise prescription, myocardial infarction, heart-lung capacity

I. MYOCARDIAL INFARCTION

A. Concept of myocardial infarction

Acute myocardial infarction (AMI), due to severe myocardial ischemia and myocardial necrosis or apoptosis lead to decreased ventricular systolic and diastolic function, and the sharp decline of heart function, is the main reason leading to the early death of AMI, heart-type fatty acid binding protein (H-FABP) as a new marker of myocardial injury in the early AMI increased, increasing attention has been applied to assess the prognosis of AMI, this study aims to investigate the correlation between H-FABP and AMI early cardiac function and assess their predictive value for early and later cardiac function of AMI. Continuous heart rate deceleration forces (heart rate deceleration runs, DR) refers to Holt: in the record, consecutive phenomenon that RR interval hop prolonged is s adjustment results of vagus nerve to sinu rhythm in a short time, put forward by Professor Geo Schmidt in 2012. It can quantitatively detect autonomic function in vivo, particularly in vagal tone, have a good warning effect on the risk of sudden death after myocardial infarction. At present, domestic and foreign studied more on heart rate decelerative force value to predict the risk of death of the patients with myocardial infarction, but studies has not been reported the clinical value of

stratified DR to the patients with acute myocardial infarction, this paper discussed on this correlation.

B. Data Collection

Version12. 5 Holter analysis system made by DMS Company was used on the subjects to perform 24 h Holter monitoring, recording and playback. Interference will be removed by man-machine dialogue, artifact, and the analysis system automatically calculates the DC values and associated data of heart rate variability. DC value analysis criteria filters the 24 h Holter by 500 Hz digital automatic processing system and filters out the deceleration period, and heart rate than in the previous section to extend the value of the cardiac cycle is fixed at 20 cycles by deceleration tap for the center, and then order different heart rate segment. The signal corresponding to the average number of cycles, after the entire sequence phase, corresponding respectively to calculate the average cycle, OX (0>: the average of all the center of RR interval; OO XW: the right of the center next to the first one ③ X (a 1); mean cardiac cycles: a first average value of the left side of the center point of a next cardiac cycle; mean left center section adjacent two cardiac cycles; X (a 2). . calculate X (0), X (4), X (a 1), X (a 2) of the mean, and substituting into equation $DC (ms) = 1/4 [X (0) + X (1) + X (a 1) - X (a 2)]$ to obtain a DC value.

Heart rate variability(HRV) and the total standard deviation of Nn intervals(SDNN) of time domain: Standard deviation of normal sinus rhythm within a specified time in RR interval in units of ms, automatically determined by Holter analysis system. 1.3.4 DR risk stratification of evaluation criteria, high risk: DR40 OS%; moderate risk:.. DR4> 0 OS%, and DR2, 5.4% or D R8 (0 005%; low risk:.. DR2> 5.4%, and DR4> 0. OS%, and DR8> 0. 005%. Left ventricular fraction(LVEF) is tested by echocardiography (GE Vivid7 type). Coronary artery stenosis uses a modified crown pulse points based on results of coronary angiography lesions, left main, left anterior descending artery, the left circumflex artery and the right coronary artery stenosis in each of their inner diameter of each place were scored: no stenosis is 0 points, 1% of a 24% stenosis count 1 points, 25% of a total 2 points to 49%, 50%, 74% of a total 3 points, 75% to 99% total 4 points, 5 points total occlusion, left main disease was calculated by two; then calculated for each coronary per meter and narrow, namely coronary artery score after AMI onset within 6h venous blood in 2 ml, timely serum was separated using a double antibody sandwich assay of serum H-FABP, random blood testing in the control group.

kit provided by Bio corporation (Netherlands). WellscMK3 detection microplate reader, all candidates, AMI patients were admitted to hospital underwent echocardiography to detect States, the use of GE color Doppler echocardiography in patients with left ventricular ejection fraction were measured (LVEF) and Left ventricular end-diastolic diameter to detect left ventricular systolic function; parasternal long axis in Figure measurements LVPWT and IVST, and apical four-chamber Figure mitral.

C. *Reasons that may induce myocardial infarction*

Incidence of myocardial infarction may have an incentive, such as strenuous labor, exercise, mental stress, meal, after stool; also be no incentive such as occurs during sleep. Precordial severe pain is the earliest and most prominent symptoms of patients with myocardial infarction, after having nitroglycerin tablets, relieve symptoms are still worse, we should think that myocardial infarction may occur. Then, to calm their emotions, place the patient supine or other suitable position, such as the time watching TV or talking, then can get a desirable seat, and lean back, foot may be slightly raised, to minimize unnecessary move. The one who has aerobic airbags at home may have oxygen immediately. Keeping nitroglycerin tablets in the mouth, or have pills., the family which has sedative, analgesic drugs also can consider taking some; lidocaine (a preventive treatment of cardiac arrhythmias ventricular fibrillation drugs) can also be applied. At the same time, ask the doctor to come home as fast as possible.

D. *Statistical*

Studies suggest that increased blood consistency and platelet aggregation can lead to increased blood lipid peroxides, slow down metabolism, thereby increasing the levels of free radicals, resulting in endothelial damage. Tanshinone can improve the consistency of blood, improve vascular microcirculation, increase brain tissue oxygen supply, curb inflammatory cytokine production, thus protecting cerebral vascular endothelium. In this study, these findings are consistent with the observation group after treatment, ESR, EB, NBL, NBH was significantly lower than that in the control group, the difference was statistically significant, and rehabilitation exercise can improve hemodynamics.

In summary, the rehabilitation exercise can improve hemodynamics and lipid levels in patients with acute myocardial infarction after thrombolysis for myocardial protective effects, improving patient prognosis. Acute myocardial infarction is a major cause of heart failure, severe myocardial ischemia and myocardial necrosis or apoptosis in cardiac function after AMI resulted in a sharp decline is the main reason for poor prognosis AMI.

E. *Quality of Life*

Quality of life (QOL) is also known as quality of survival. The concept of a comprehensive evaluation of the pros and cons of living usually refers to a result of the development of social policies and programs. Unlike the concept of quality

of life, standard of living, the living standards of the answer is to meet the material and cultural needs and consumer products and services more with less, the quality of life is to answer living "good or not." Quality of life shall be based on the standard of living, but its meaning has greater complexity and breadth, it is more focused on the needs of senior people to meet the spiritual and cultural evaluation of the extent and environmental conditions.

II. REHABILITATION EXERCISE

A. *The concept of rehabilitation exercise*

Rehabilitation or "recovery", "restored to its original normal or good state." For diseases and injuries caused by dysfunction, to restore normal or near normal as possible and applied medicine and technology, called "rehabilitation medicine." In other words, rehabilitation medicine is a pair of injuries and disabilities in the rehabilitation of physical and mental discipline, which aims to eliminate or reduce the functional disorders, and to maximize the recovery of life and ability to work, reintegration and families.

Modern medicine and rehabilitation medicine-based clinical subjects related to medicine, involving physics, kinematics, engineering, psychology, nursing, gerontology, sociology and architecture, such as multi-disciplinary. Their treatments depend not only on drugs and surgery, and pay more attention to physical therapy, physical therapy, work therapy and psychotherapy, advocating their functional training. Given the importance of rehabilitation medicine and its remarkable characteristics of human health, it is believed, rehabilitation medicine and preventive medicine, clinical medicine already has equal importance, becoming one of the three major components of modern medicine. Therefore, rehabilitation medicine is also known as the "third medicine."

B. *Features Rehabilitation Movement*

Rehabilitation exercise can cure diseases and rehabilitation of the function of each organ system, it can make infirm people stronger, improve the body's ability to resist, adjust emotional state, and exercisers in practice must be based on their condition and physical condition of the right remedy, so it is highly targeted.

C. *Initiative*

Participate in rehabilitation exercise, generally have a strong spirit of initiative, and use a strong will to overcome difficulties from within and outside the body, to overcome a variety of diseases, only sufficient awareness of the initiative, enable participants to achieve fitness and strength, rehabilitation diseases and therapeutic purposes.

D. *Naturalness*

Rehabilitation exercise can achieve the purpose of prevention of the disease by the body's natural activity, regardless of age, sex and physical strength limitations, as long as the right way, the right medicine, you can receive good results, and does not produce side effects on the human body.

E. Dual effect

Rehabilitation exercise can prevent disease, but also keep fit. When participating in sports rehabilitation, targeted to prevent a disease process, but also a process of promoting physical and mental health. Whatever form we participating in, whatever nature of the rehabilitation exercise, physical rehabilitation has the dual effect of promoting physical and mental health.

III. HOW TO DO REHABILITATION EXERCISES FOR INFARCTION PATIENTS

Patients with acute myocardial infarction discharged from hospital, does not mean that coronary heart disease has disappeared, relapse is still possible, therefore, during convalescence at home, one should have the ability to learn to self-conditioning.

Pay attention to rest, after appropriate activities, to establish a rational way of life, live on time, and ensure adequate rest and sleep, not to go shopping or visit friends and relatives too frequently, in order to avoid fatigue. But it should be adequate exercise; exercise more or less depends on the patient's age, physical condition and heart function. Walking is a simple way of sport, may take one time in the morning and later afternoon, gradually increase the distance and speed. Broadcasting gymnastics, tai chi, swimming and doing qigong etc. can be used. Movement should be step by step, not be too hasty. If after the activity or exercise, there appears palpitations, shortness of breath, chest pain, rapid heart rate or irregular heartbeat, the reason may be excessive movement, then one have to go to the hospital, looking for reasons to be adjusted exercise.

To control their emotions, and avoid "impassioned beverages", Modern medical research has proved that nervousness, agitation can increase vasoactive substance such as catecholamine, epinephrine in the blood, increase blood pressure, heart burden, then induced angina and myocardial infarction, therefore, patients with myocardial infarction should learn control emotions by themselves, to avoid the "impassioned" beverages, to be open-minded, cheerful mind, to avoid adverse stimuli, not to look intense sports game and thrilling horror movies and television.

Diet, do not eat too full. The diet is necessary to ensure essential nutrients, but also limit the intake of high-fat diet, and control the weight. Appropriate diet should not be too salty or too sweet, eat more vegetables, fruits and more food containing cellulose.

Pay attention to the cold weather, avoid the cold stimulation which can cause coronary artery contraction, leading to myocardial ischemia and hypoxia; cold also makes fibrinogen in the blood increase, as well as blood

viscosity, thus, patients with coronary heart disease in the fall and winter seasons, should increase or decrease clothes according to the climate change, and avoid having a cold while walking, do not go to the toilet at night.

Take medication and review regularly, after the patient with myocardial infarction discharged, they should be directed to take medication regularly. First aid box is essential at home, when severe angina occurs, one can take 0.3 ~ 0.6mg of nitroglycerin. If it is useless, amyl nitrite ampoules can be placed on the nose after crushed and placed on the handkerchief, and do deep breathing 2 ~ 3 times, if the pain is still not alleviated, you should immediately call an ambulance to the hospital. During the time to recuperate, regular review of blood pressure, heart rate and electrocardiogram is necessary to understand changes in heart function, so that guidance can timely access to medical treatment.

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