Exercise for Cardiac Patients

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LI: ***Exercise for Cardiac Patients.*** *Cardiac rehabilitation is a comprehensive multiple interventions program which involves different risk factors and life-style modifications. Exercise is one of the core components in the secondary prevention of this cardiovascular disease. The benefits of exercise training include both physiological and psychosocial aspects. Traditional aerobic endurance training is believed to improve the cardiovascular function, alter unfavorable blood lipid profile and enhance optimal haemodynamic conditions such as resting heart rate and blood pressure of cardiac patients. Resistant training is recommended to cardiac patients aiming at increasing the lean body mass, muscular strength and endurance. Stretching exercise is also suggested to maintain the joint range and flexibility of cardiac patients to minimize the chance of injury during exercise. Screening by physician, risk stratifications, appropriate supervision during exercise training and adequate knowledge on the disease is crucial for safe exercise training of cardiac patients. (J HK Coll Cardiol 2006;14(Suppl 2):B73-B75)*

Benefits and risks of exercise, cardiac rehabilitation, exercise training, types of exercise

摘要

心臟病復康是一項全面性的綜合治療計劃，它包含了不同的危險因素和生活模式的改變。運動鍛練是心血管疾病二級預防中的一項核心內容。運動鍛練的益處包含了生理和心理兩個方面。傳統的帶氧耐力訓練被認爲能夠提高心臟病患者的心血管功能，改善血脂狀況，穩定血流動力學指標，如靜息心率和血壓。阻力訓練旨在增加身體的純體重、增強肌肉的力量和耐力，而伸展訓練能夠保持心臟病患者的關節運動幅度和柔韌性，以減少運動時受傷的機會。醫生的篩選、風險分層、運動訓練中的適當監察和充足的疾病知識是心臟病患者運動時訓練的安全關鍵。

關鍵詞：鍛練的益處和風險　心臟病復康　運動訓練　運動種類

Introduction

Cardiac rehabilitation is defined as a coordinated, multifaceted interventions designed to optimize a cardiac patient's physical, psychological and social functioning, in addition to stabilizing, slowing or even reversing the progression of the underlying atherosclerotic processes, thereby reducing morbidity and mortality.[1] Exercise training is one of the core components in a comprehensive cardiac rehabilitation program.[2,3] Exercise training is also included in the secondary prevention of patients with cardiovascular disease.[4-6]

Traditional cardiac rehabilitation program was categorized into four phases- phase I (in-patient), phase II (out-patient based with electrocardiography (ECG) monitored exercise and or education), phase III (out-patient based with intermittent or no ECG monitor) and phase IV (No ECG monitor).[3] However, with the advancement of medical management and intervention (such as new medications and more aggressive revascularization intervention), the four phases are much shortened.

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Benefits of Regular Exercise Training on Cardiac Patients

Different physiological mechanisms induced by exercise training act upon cardiac patients. Some theory suggests that long-term endurance aerobic training will affect the autonomic nervous system and reduce heart rate at rest, during exercise and in recovery phase through increasing the resting vagal tone and reducing the sympathetic drive during exercise. The result will be a reduction in double pressure product and myocardium requirement at any oxygen uptake or any sub-maximal workload.[3] In addition, moderate exercise training influence myocardial perfusion with less ST segment depression during exercise testing and reduce anginal symptoms and resolution of reversible myocardial perfusion abnormalities etc.[3]

Other benefits of aerobic exercise training on cardiac patients include reduction of risk factors of chronic disease such as decrease in total blood cholesterol, serum triglycerides and low-density lipoprotein cholesterol and increase in the serum "antiatherogenic" high density lipoprotein. Furthermore, endurance training enhance reduction in resting systolic and diastolic blood pressure, reduction of insulin needs and improved glucose tolerance, reduction of total body fat and increase in lean body mass. The blood profile will also improve by reduction of blood platelet adhesiveness and aggregation.[3]

There are also some general benefits of exercise training such as improvement in cardio-respiratory function via increase in maximal oxygen uptake resulting from central and peripheral adaptations, increase in capillary density in skeletal muscle, decrease in minute ventilation, myocardial demand, heart rate and blood pressure at sub-maximal workload etc.[3] Psychosocial improvement with regular exercise training may reduce stress, depression and promote sense of well being.[3]

Type of Exercises for Cardiac Patients

It is generally accepted that aerobic endurance exercise training is regarded as the optimal exercise for cardiac patients. Aerobic exercise such as brisk walking exercise, calisthenics, and swimming are good choices of exercise for cardiac patients. Resistant exercise is strongly recommended by different organizations and Advisory Boards.[3,7,8] It is simple and practical for old age cardiac patients to use light weight dumbbells, wrist weight, pulley and rubber bands in resistant training. The effect of resistant training will increase and preserve the muscle mass of old age patients, increase calorie expenditure by increasing basic metabolic rate of the body and thus decreasing body fat. It also increases the muscular strength of old age frail patients which will reduce the chance of fall and increase their independent social life.[9,10] Furthermore, appropriate stretching exercise is essential to maintain joint and soft tissue flexibility and enhance muscular performance.

Discussion

The risk of any cardiac events during cardiac rehabilitation program is rare. A follow-up study reported that the averaged incidence of cardiac arrest, non-fatal myocardial infarction and death is about one in every 117000, 220000 and 750000 patient-hours of participation in cardiac rehabilitation program respectively.[11] Despite the relative low incidence rate of cardiac event for cardiac patients attend the cardiac rehabilitation program, careful screening by physician and risk stratification of cardiac patients are prerequisites for cardiac patients to commence any exercise training. A tailor-made program for individual cardiac patient, appropriate supervision during exercise training, patient's knowledge on the disease and proper way of handling of adverse event are important for every cardiac patient.

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