Review Article

Benefits of exercise in cardiac fitness

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ABSTRACT

Exercise training increases cardiovascular functional capacity and decreases myocardial oxygen demand at any level of physical activity in apparently healthy persons as well as in most patients with cardiovascular disease. Cardiorespiratory fitness primarily refers to the capacity of the heart and lungs to deliver oxygen to skeletal muscles, and maximal aerobic power is an indicator of the maximal capacity of oxygen delivery. Individuals with a high maximal aerobic power can undertake the demanding physical task without suffering fatigue. Regular physical activity is required to maintain these training effects. Regular physical activity increases exercise capacity and plays a role in both primary and secondary prevention of cardiovascular disease. Consultations with a medical professional and diagnostic exercise test for coronary heart disease can be useful when it is clinically indicated. Regular exercise is associated with several cardioprotective effects, including improving the endothelial function and reducing systemic inflammation.

KEY WORDS: Aerobic exercises, Cardiovascular, Physical fitness

INTRODUCTION

A program of regular exercise that includes cardiorespiratory, resistance, flexibility, and neuromotor exercise training beyond activities of daily living to improve and maintain physical fitness and health is essential for most adults. In addition to exercising regularly, there are health benefits can be acquired in also reducing the total time that is engaged in sedentary lifestyle and also by interspersing frequent and short bouts of standing and physical activity between the periods of sedentary life, even in physically active adults. Adults can be educated about the signs and symptoms of coronary heart disease (CHD), and gradual progression of exercise intensity and volume may reduce the risks of cardiovascular diseases.[1]

PHYSICAL FITNESS IN THE PREVENTION AND TREATMENT OF CARDIOVASCULAR DISEASES

Artherosclerotic Risk Factors

Physical activity helps in both preventing and treatment of many established atherosclerotic risk factors, including elevated blood pressure, insulin resistance and glucose intolerance, elevated triglyceride concentrations, low high-density lipoprotein cholesterol (HDL-C) concentrations, and obesity.[2] Exercise in combination with weight reduction can decrease low-density lipoprotein cholesterol concentrations and limit the reduction in HDL-C that often occurs with a reduction in dietary saturated fat.[3] In general, the effect of exercise on atherosclerotic risk factors is substantially less than that achieved by pharmacological therapies, although the exercise effect can be significantly magnified by other lifestyle changes such as changes in dietary composition and weight loss. Physical activity also reduces insulin resistance and glucose intolerance, postprandial hyperglycemia, and possibly hepatic glucose output.[4] Some of the effect of physical activity on cardiovascular risk factors is an acute effect of recent exercise and is not dependent on prolonged exercise training or improvement in fitness. Vigorous exercise also acutely reduces systolic blood pressure, and this effect may persist for up to 12 h. Exercise also has favorable acute effects on glucose homeostasis. These acute effects provide additional support for the recommendations from the CDC and the ACSM that adults should participate in moderate-intensity physical activity on most days of the week.[5,6]

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Angina Pectoris

Exercise training is also found to be useful in patients with angina pectoris who are not candidates for revascularization therapy due to disease not amenable to intervention, angiographically noncritical stenoses, or patient preference.[7] In a study, the increase in rate pressure product (RPP) at the onset of angina occurred only during exercise, wherein the RPP at the onset of angina with ventricular pacing was unchanged. This suggests that exercise training altered the coronary vasomotor response to exercise.[8]

Although the benefits of regular exercise outweigh its potential risks in patient with stable angina pectoris, it is also recognized that habitually sedentary patients with CHD who engage in strenuous physically activity are at increased risk of myocardial infarction and sudden cardiac death.[9] Patients with angina who are not routinely active should initially engage in low-intensity activities before engaging in more vigorous physical activity. General recommendations include low-intensity aerobic training, i.e., <40% of maximum, and aerobic capacity 50–70% of maximum heart rate 3 times per week at the outset. Exercise intensity may progressively be increased as tolerated. If ischemia or anginal symptoms occur during exercise testing, the target heart rate should generally be fixed at 10 beats/min below the observed ischemic threshold. Each exercise session should consist of (a) a 10 min warm-up period consisting of stretching and low-level calisthenics, (b) a 20–30 min period of aerobic exercise, and (c) a 10 min cool-down period also involving low-level calisthenics and walking.[10]

Treatment for Patients with Peripheral Arterial Disease and Claudication

Progressive physical activity is an effective treatment for improving walking distance in patients with peripheral arterial disease and exercise-induced claudication. Supervised exercise may serve as primary therapy for many individuals with claudication if such a program is available and if claudication is the primary functional limitation. Although there are direct comparisons of therapeutic exercise programs and pharmacological or surgical interventions, the increases in walking distance are greater than those reported for the most widely used agents for claudication, pentoxyphyline, and cilostazol. The greatest improvement with exercise training for claudication occurred with training to maximally tolerated pain, when training lasted at least 6 months, and when walking was the primary mode of exercise.[11] A review of randomized controlled trials suggests that the evidence favoring exercise training outweighs that for peripheral angioplasty in improving exercise tolerance in claudication patients.[12]

In Treatment of Patients with Heart Failure

Numerous trials have demonstrated that both exercise testing and training of patients with heart failure (HF) appear to be safe. A detailed discussion of exercise and heart failure was given in the American Heart Association Statement on Exercise and Heart Failure.[13] In addition to improving exercise capacity, exercise training in HF patients has been found to improve cardiac output at maximal workloads, improve the mitochondrial size and density, increase skeletal muscle oxidative enzymes, reduce endothelial dysfunction, and decrease circulating catecholamines.[14-16]

Exercise Training for Older Patients with Coronary Artery Disease

Older patients constitute a high percentage of those with diagnosed coronary artery disease (CAD) and are at high risk for disability after a coronary event. Studies of exercise rehabilitation in patients 65 years of age have evaluated outcomes in elderly patients with coronary disease.[17] Older patients with CAD have exercise trainability comparable to that of younger patients participating in similar exercise rehabilitation, with elderly male and female patients showing comparable improvement.[18] There are no significant complications or adverse outcomes of exercise training in older patients have been observed in any of the studies. Consequently, older patients of both genders should be strongly encouraged to participate in exercise-based cardiac rehabilitation.[19] In a British Regional Heart Study, men with CAD and a mean age of 63 years who engaged in light to moderate physical activity had a significantly lower all-cause mortality over the 5-year follow-up than did their sedentary counterparts.[20]

CONCLUSION

A healthy life is a wealthy life. Heart is the only organ to pump oxygenated blood to all parts of the body and henceforth cardiac fitness is very essential to have a general body fitness. Modified food habits and sedentary lifestyle make the risk of cardiac disease more worse. An individual's customary physical activity level should be an integral part of a comprehensive medical history. Professionals with a background in exercise science should work with medical personnel to establish appropriate exercise programs for persons with diagnosed health problems or who are at high risk for developing major health problems.

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