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The Role of Exercises in Reversing Cardiovascular Risks

PaulChris Okpala[1]

Abstract

Cardiovascular disease seems to be the number one killer in the developed world, and is slowly becoming a major concern for mortalities even in the developing world. The high risk factors for (CVD) include sedentary lifestyle, physical inactivity, ill habits, tobacco usage, high fat and high-energy diet, etc. In the past, there is some amount of evidence that CVD can be managed and even reversed through exercises. This was able to be proved through various studies that were conducted in subjects who performed exercises. Aerobic exercises helped to improve cardiovascular fitness gradually. These exercises should be performed for 20 minutes to one hour for five times weekly; and, should ensure that the intensity of the exercises is not very high. Exercises such as Tai chi and Yoga also seem to be very effective in the regression of CVD. However, along with exercises other additional treatment ensures such as diet control, weight reduction, lifestyle changes, giving up smoking, etc, would help to ensure greater number of benefits to the patient.

Keywords: Cardiovascular disease, Risk factors, Exercises, Sedentary lifestyle, Weight reduction.

1 Incidences

Reference [1] studied more than 13000 patients and found that when the cardiovascular fitness levels improved the chances of dying from coronary artery disease (CAD) were lower. Two studies namely, the Nursing Health Study and the Women's Health Initiative Observational Study found that when the individual perform brisk walking activities, the chances of developing CAD reduced by 30 to 40 %. According to the Harvard Alumni study, when more calories were spent the risk of dying from CAD also reduced. Studies showed that diet and physical activity could have a good effect helping to lower the serum lipid levels, improve angina in patients and ensure that patients who previously had myocardial infarction and treated with bypass surgery, had a better chance to lead a normal lifestyle. Such patients did not need medications for treating cardiac abnormalities and hypertension after a few years. Further, the need for bypass surgery also reduced. The

[1]DHSc, MHA, RCP, A.T Still University of Health Sciences, Doctor of Health Sciences Alumni.

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cholesterol and the LDL levels reduced by 23 %, individually. Physical activity along with diet also helped to lower the C-reactive protein levels, which can be considered an indicator for myocardial infarction. Often C-reactive protein (CRP) levels are considered along with the total cholesterol levels to determine the cardiovascular risks (than LDL levels alone). A study by Pritikin demonstrated that diet and exercise could help reduce the CRP levels by 45 %. The CRP acts by promoting inflammation, which in turn causes atherosclerosis resulting in greater cardiovascular risks. Exercise can help lower Triglyceride levels, increase the levels of antioxidants, lower cytokine production which helped lower inflammation and reduce the risk for CVD [2].

2 Discussion

It has been a known fact that exercises helps to improve physical fitness and the cardiovascular health (as consistent evidence is existent since the last 40 to 50 years). Several important organizations including the Center for Disease Control (CDC), the American Heart Association (AHA), the American College of Sports Medicine (ACSM), and the Office of the US Surgeon General have conducted research (jointly) in this field and have reinforced the scientific community and general public that exercises would have a positive role over cardiovascular health. Overall, it is found that individuals who are physically fit and not obese develop lesser cardiovascular problems compared to those who are obese and lead a sedentary lifestyle. In individuals who are physically fit and exercise regularly, it is found that coronary heart diseases usually occur later and cause less severe problems. However, in spite of the strong advice from the scientific community that exercises are good for the cardiovascular health, it has been found that more than 250, 000 people in the US die from poor physical activity. In addition, there is increasing evidence from the scientific community that exercise have a positive implication over the non-cardiovascular diseases such as diabetes, hypertension, colon cancer, osteoporosis, etc. Only about 30 % of the people in the US are able to meet with the advice suggested by the CDC, AHA and the ACSM [3].

According to the AHA, a sedentary lifestyle along with other risks such as abnormal lipid levels, smoking, obesity, hypertension, etc, has the potential of causing cardiovascular diseases. There is evidence showing that doing exercise after developing cardiovascular risk factors can potentially reduce the risks of having another cardiovascular event such as a heart attack, angina or stroke. There would also be a reduced need to perform revascularization interventions such as bypass surgery or angioplasty. Even if the risk factors are present and active, exercise can help to reduce them and reverse cardiovascular disease. For example, exercise encourages weight reduction, reduces obesity, blood pressure and even decreases the level of low density lipoprotein (LDL) and elevates high density lipoprotein (HDL) in the blood. The use of insulin by the body is improved which leads to a decrease in the symptoms of diabetes. However, when exercises are combined with other improvements in lifestyle changes (including drug usage, giving up smoking, better nutrition, reduction in weight, etc), would create a drop in risk for progression of cardiovascular diseases [3]. As the individual performs exercises regularly, the ability to use oxygen improves, the stamina levels would increase, and the fatigue levels would reduce. Patients suffering from a cardiovascular disorder usually have lower exercise tolerance than people who are physically fit. Exercises also improve the blood flow in the blood vessels, along with improvements in muscular strength, muscle flexibility, and bone

health [3]. Exercise can also carry certain risks especially during the time of performance. For example, an individual who is doing exercises has a slight risk for developing a cardiac complication during the performance of the exercise, which in fact is very small (ranges from 1 in 400000 to 1 in 800000 hours of exercising, but may be higher in patients with active heart disease). However, in most instances, critical heart events occur at rest rather than during exercises. If the individual experiences can unusual symptom during the performance of exercises such as breathlessness, chest pain, chest discomfort, palpitations, etc, the exercise should be stopped immediately and medical attention should be sought [3].

Aerobic exercise seems to be the best to reverse cardiovascular disease. Any exercise that is performed through repetitive movement and can bring the heart rate up to a specified level and keep it at that level for a certain period is known as 'aerobic exercise'. For different categories of people such as obese, overweight, underweight, etc, aerobic exercise would be a health benefit. For example, an obese individual can do less amount of exercise to spend more amount of energy, compared to a thinner and physically fit individual. When an individual begins to exercise, more exercise amounts need to be done in order to spend the same amount of energy (as the individual finds the exercises easier). Once the individual become fitter, the number of heart beats per minute would reduce suggesting that lesser stress would be spend on pumping the blood through the blood vessels by the heart. However, individuals should also consider that their maximum heart rate should not be reached and hence should consult their physicians. The maximum heart rate is obtained by subtracting the age from 220. It should be calculated during the period when the individual is performing the exercise and should be monitored constantly. The individual should also be cautious about any medication that can lower the heart rate and hence demonstrate a wrong reading. When the individual is initially starting the exercise, the maximum heart rate should be about 45 % of the maximum level, and can gradually be increased to 70 % [4].

Amongst the common aerobic exercises that could be particular beneficial to patients suffering for cardiovascular diseases includes walking, biking, running, swimming, hiking, etc. As alternatives to these, Tai Chi and Yoga can be performed. Tai chi is a series of stretching exercises that are continuous and graceful and are smoothly blended into one exercise session. It seems to be a very gently to practice and does not carry any serious risks. Yoga is a group of exercises that help the individual to stretch, relax and tone the muscles. Yoga gives huge importance to breathing coordination and hence is of immense benefits to the cardiovascular system [4]. Cardiovascular exercises should be performed at least three to five times a work for sessions ranging from 15 minutes to 1 hour per day. The intensity of the exercises should be depended up on the age-related maximum heart rate (usually varies from 45 % to 70 % of the maximum heart rate). It has been usually suggested that no benefits may arise if the 70 % limit of the maximum heart rate is crossed. To ensure that no injuries to the muscle groups develop, exercises should be started with a warm-up session and end with a cool-down session [4]. To ensure that the individual exercise schedule is beneficial, changes to the diet and lifestyle has been suggested. This include adequate intake of fluids, multivitamins and minerals. Smoking should be given and additionally medications may be required [4].

2.1 Interventions

Reference [5] suggested that cardiac rehabilitation be build around better physical activity to control the risks factors and reduce the symptoms. The atherosclerosis process can effectively be stopped or reversed by modifying the risks. Reference [5] also suggested various activities such as strength straining, arm exercises, cardiopulmonary workouts, aerobics, warm-up, cool downs, flexibility, endurance training, etc. Such exercises are especially beneficial during the post-myocardial infarction period, helping the patient rehabilitate better. Reference [6] found that the major cause of ischemic heart disease was atherosclerosis, which could be effectively controlled or prevented using exercises. However, the author suggested better lipid management also was required for more effective reversal of disease. In this study, the researchers analyzed the use of a community-based outpatient cardiac rehabilitation program, which helped to reduce the cardiac risks and prevent the disease from progressing further. The patients took part in a three-month program and several measurements including blood pressure, exercise capacity, lipid profile, weight, etc, were monitored. About 32 % of the patients who had been previously hospitalized for cardiac diseases had joined this study. 25 % of the study population dropped out during the first three months. There was a decrease in the LDL levels, increase in the HDL levels, BMIs, drop in the systolic blood pressure, stabilization of the blood vessels and regression of the disease [6]. Such community-based exercise programs were beneficial for cardiac patients.

The goal of exercise should be to make the heart (like any other muscle) stronger and healthier. Activity would also help lower stress, maintain a healthier body weight, quit smoking and regulate the blood glucose levels. Moderate exercise performed for half an hour five days a week seem to be useful. Aerobic activities are the best for the cardiovascular system [7].

3 Conclusion

Cardiovascular disease has been a huge cause of concern in the Western world. In the year 2001, about 39 % of all deaths were due to CVS. Some of the previous studies have demonstrated a reduction in the previously formed plaque by strict changes in lifestyle. However, the atherosclerosis plaques that were studied were often mild and the lifestyle changes suggested were often very difficult to follow. In a study conducted by Reference [8], the effect of Yoga over the cardiovascular system in patients suffering from cardiovascular disease was closely studied. Along with Yoga other interventions such as diet changes, greater PUFA consumption, high fiber diet, stress management, etc, was suggested. These interventions were closely followed for 12-month duration. After one year, it was found that the LDL levels and triglyceride levels decreased, the body weight decreased and there was greater tolerance to exercises. In the Yoga group, the atherosclerotic lesions reduced, whereas in the control group, it progressed. Thus, Yoga seems to be a strong intervention for reversing cardiovascular diseases [8].

Although it has been found that other measures can also help to reverse cardiovascular disease, there is nothing better and safer than exercises, as there are no ill-effects from the performance. Recently, it has been found that statins when consumed can also help to break down the atherosclerotic deposits. In this way the disease would regress than progress, helping to lower the number of myocardial infarctions. Statins helped to lower

the LDL by about 50 % and increase the HDL by 15 %. However, there is huge number of concerns associated with the use of statins. There are concerns especially about muscle wasting and about using the drug in high doses [8]. Hence, exercises are better preferred. For the cardiovascular system, aerobic exercises such as walking, running, swimming, etc, seem to increase the heart rate over extended period, improving the utilization of oxygen, increasing circulation and providing more oxygen to the tissues and the cells present in the body. If the individual wants to improve muscle strength, anaerobic exercises seem to be useful. For cardiovascular patients, aerobic exercises are sufficient to improve the functioning of the heart and reverse to a certain extent the risk for cardiac diseases [10]. Exercises should be performed for three to five times a week, for period ranging from 20 minutes to 60 minutes and should have intensity such that the level of 40 % to 70 % of the maximum heart rate should be reached. Reference [10] felt the greater use of an intensive lifestyle program to help reduce the cardiovascular risk factors. There is no doubt that lifestyle modification can help reverse the process of atherosclerosis and hence reduce the cardiac risks. Frequently exercise has to be combined with other lifestyle changes including diet modification and reduction of risk factors.

References

[1] Blair, S.N., Kohl, H.W., Paffenbarger, R.S. Jr, Clark, D.G., Cooper, K.H., Gibbons, L.W. Physical fitness and all-cause mortality; a prospective study of healthy men and women. *JAMA*, **262**(17), (1989), 2395-2401.

[2] Roberts, C. K., Bernard, R.J. Effects of exercise and diet on chronic disease. *Journal of Applied Physiology*, ***98****(1), (2005), 3-30*

[3] Myers, J. Cardiology Patient Page Exercise and Cardiovascular Health. *Circulation*, ***107****(1), (2003), e2-e5*

[4] Pinchney, N. (2002). Exercise, retrieved on April 24, 2009, from: http://heart.kumu.org/exercise.html

[5] Leon, A.S. (2000). Exercise following myocardial infarction. Current recommendations. *Sports Medicine*, **29**(5), (2000), 301-311.

[6] Leibowitz, M. Bental, T., Neuman, Y., Bar-On, Y., Khaskia, A., David, D. Coronary risk factor management in the framework of a community hospital-based ambulatory exercise training program. *Prev Cardiol*, **7**(2),(2004), 59-63.

[7] Cleveland Clinic (2009). Preventing and Reversing Cardiovascular Disease, Retrieved on April 24, 2009, from: http://my.clevelandclinic.org/disorders/Heart_Disease/hic_Preventing_and_Reversing_Cardiovascular_Disease.aspx

[8] Manchanda, S.C. Narang, R., Reddy, K.S. (2008). Coronary Atherosclerotic Reversal Potential of Yoga Life Style Intervention, Retrieved on May 23, 2009, from: http://www.prekshaheart.com/research.html

[9] Healthy Heart Guide (2009). Cardiovascular Disease and Fitness, Retrieved on April 24, 2009, from: http://www.healthy-heart-guide.com/cardiovascular-disease-and-fitness.html

[10] Marshall, D. A. Walizer, E.M., Vernalis, M.N. Achievement of heart health characteristics through participation in an intensive lifestyle change program (coronary artery disease reversal study). *Journal of Cardiopulmonary Rehabilitation Prev*., **29**(2),(2009), 84-94