

Rehabilitation and Therapies Restore Normal Blood Flow

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Introduction

An essential part of any cardiac rehabilitation program is achievement of a healthier lifestyle through a program of cardiac risk-factor modification. Cardiac risk factors are divided into two major groups: reversible and irreversible risk factors. Irreversible risk factors include male gender, past history of vascular disease, age, and family history [1]. The patient and family have to be educated on the presence of risks, and where appropriate, family counselling can be added. Early and aggressive attention to reversible risk factors is essential in individuals with significant irreversible risks. Reversible risk factors for cardiac disease include obesity, sedentary lifestyle, hyper-lipidemia, cigarette smoking, and conditions such as diabetes mellitus and hypertension [2]. Modification of these risk factors is a part of a cardiac rehabilitation program, and should be part of a heart healthy lifestyle for all individuals. These same principles also need to be applied to the disabled population because they often are at further increased risk through weight loss, immobility, and deconditioning [3]. Close control of blood sugars has been shown to decrease the risk of cardiac disease through the slowing of the development of atherosclerosis and secondary conditions, such as nephrogenic hypertension. Exercise training can also help to improve diabetic control. The exact benefits of exercise training in combination with good glucose control are still being elucidated. Control of hypertension has been shown to be beneficial in individuals with normal cardiograms [4]. Reduction of dietary salt and increased exercise to improve conditioning in combination with pharmacological management can significantly improve blood pressure. The major agents for the control of hypertension are divided into β -blockers, α -blockers, diuretics, calcium channel blockers, and angiotensin-converting enzyme inhibitors [5]. Because of the combination of antihypertensive effects and lower myocardial oxygen consumption through decreased inotrope and heart rate, β -blockers are the most effective agents. Diuretics and angiotensin-converting enzyme inhibitors have also been shown in large trials to have beneficial effects on decreasing cardiac mortality. The cardiac effects of calcium channel blockers are not clear, but some early data may indicate an actual increase in MI with certain agents, and it is recommended that rehabilitation physicians seek the advice of the treating cardiologist or internist for assistance in the optimal management of each individual patient [6]. Lowering cholesterol levels and increasing high-density lipoprotein is associated with decreased risk of cardiac disease. Patients can decrease their lipids by adhering to a low-cholesterol, low-fat diet along with weight reduction, even without the addition of exercise. The American

Heart Association recommends that the total amount of calories from fat in the diet should not exceed 30% [7]. Control of cholesterol can be achieved through a three-step program, as outlined in the National Cholesterol Education Program guidelines. Phase I is an adoption of nutritional guidelines, lifestyle changes, and general improvement in health habits. Phase II adds fibre supplements and possibly nicotinic acid. Phase III includes lipid-lowering drugs. Lipid-lowering programs have been shown to retard the progression of CAD. With the addition of physical activity, high-density lipoprotein cholesterol concentration can rise 5–16%, but the data on the lowering of low-density lipoprotein cholesterol is still controversial [8]. A good understanding of cardiac anatomy helps in providing cardiac rehabilitation. Of particular

importance is a familiarity with the normal distribution of the major arteries of the heart with ischemic distributions and valvular anatomy. Some important functional and anatomical issues are briefly covered here. The cardiac conduction system facilitates the appropriate sequencing of the contraction of the atria and ventricles at the physiologically appropriate rate [9]. Conduction blocks can occur as a result of MIs, aging, and other conditions. Abnormalities of cardiac conductions, such as congenital defects and accessory tracts, can lead to arrhythmias, both atrial and ventricular, which can lead to life-threatening arrhythmias. Normally, there are left and right coronary arteries arising from the base of the aorta in the left and right aortic sinuses. The left main coronary artery divides into the left anterior descending and the circumflex arteries, whereas the right coronary artery continues on as a single vessel. Approximately 60% of individuals have right-dominant circulation [10].

Acknowledgement

None

Conflict of Interest

None

References

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