Physiology Behind Exercise and Prevention of Coronary Artery Disease

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An Overview of Coronary Artery Disease and the Impact of Exercise

Lack of exercise is becoming a prevailing cause of death in the modern world. A sedentary lifestyle is a major contributor to coronary artery disease, which devastatingly has resulted in about 250,000 deaths per year in the United States alone (Myers, 2003). The primary findings in *The Impact of Exercise Training on Cardiovascular Disease and Risk* by Volker Adams and Axel Linke emphasizes the idea that exercising more leads to a longer, happier, and more fulfilling life. The primary findings in *Exercise and Cardiovascular Health* by Jonathan Myers further highlights the idea that exercise plays a significant role in improving one's overall heart health. Therefore, becoming educated on the impact of physical fitness and participating in regular physical activity is the best thing that one can do for themselves.

What is Coronary Artery Disease?

A deeper dive on coronary artery disease is necessary to better understand the way it significantly affects one's health. Coronary artery disease is a heart condition that is caused by a buildup of plaque in the blood vessels and walls of the arteries (Shahjehan & Bhutta, 2023). This build of plaque is made up of cholesterol deposits. Over time the buildup of plaque leads to the narrowing of the arteries which reduces the amount of blood flow and oxygen to the heart (Shahjehan & Bhutta, 2023). One of the most common health issues that is deeply associated with this disease is heart attacks. CAD(coronary artery disease) is a leading cause of not only deaths, but heart attacks. As previously mentioned, the main cause for this one's unhealthy lifestyle. This is why it is crucial for one to lead a healthy and active lifestyle.

Physiological Changes due to Exercise

In *The Impact of Exercise Training on Cardiovascular Disease and Risk* by Volker Adams and Axel Linke they mention the various changes that occur within the body when one is exercising. These changes create a profound impact on one's health and heart. The first thing

mentioned is the overall enhancement of one's endothelial cells due to exercise training. In a study, several people with heart failure participated in exercise training. The results of regular exercise had, "beneficial effects on the vascular system, like better endothelial function and a better compliance of the vessel or reduced stiffness (Adams & Linke, 2018). These primary findings were that exercise training positively impacts the inner lining of the blood vessels, also known as the endothelium. The reason why an improved endothelial function matters is because it creates better blood dilation and improves blood flow throughout the body and the heart while also reducing muscle stiffness (Adams & Linke, 2018). The improvement of the endothelial cells is not the only factor that ameliorates when one exercises. In fact, another finding was that exercise training allows for an increased release in Nitric Oxide or NO, which is a molecule that is triggered throughout one's workout. In their studies they found that, "exercise or increased shear stress up regulates eNOS activity" (Adams & Linke, 2018). What this means is that while one is exercising NO is released which triggers a series of events that lead to the widening of the blood vessels which allows for more blood flow throughout one's muscles and organs. This goes to show that exercise creates an increased blood flow which directly impacts the delivery of more oxygen and nutrients throughout the body and muscles making exercise a significant factor in improving one's heart health.

Muscular Changes due to Exercise

The body is significantly impacted due to exercise and the health of one's heart improves overall. As a matter of fact, when one is exercising they are able to reduce inflammation throughout their entire body. The reason for CAD is because of buildup and inflammation which can be greatly reduced if one participates in a regular routine of exercising. As mentioned in the article, when one is exercising they release anti-inflammatory molecules which work together to

help reduce inflammation. This is vital as chronic inflammation is associated with the development and progression of CAD. By actively exercising one is able to lower their inflammation while also lowering their risk for CAD (Adams & Linke, 2018).

The buildup of plaque is able to be reduced in exercise as well. When one participates in a physical activity the increased blood flow leads to a clear up of fatty deposits within the body including the arteries. This act helps greatly reduce one's plaque buildup as well as their blockages (Adams & Linke, 2018). Both of these factors play a great role in the overall improvement of one's cardiovascular health which further shows the benefits of being educated and participating in a health-conscious lifestyle.

The Benefits of Exercise

In the article *Exercise and Cardiovascular Health* by Jonathan Myers he goes on to highlight the beneficial things that occur within the body when one participates in exercise regularly. The first thing mentioned is that exercise promotes weight loss which in turn can help regulate one's blood pressure (Myers, 2003). Then he goes on to say that it can reduce one's cholesterol levels which is a major result of cardiovascular diseases. Exercise also has the ability to improve insulin sensitivity which reduces one's risk for diabetes. He states that, " regular exercise has a favorable effect on many of the established risk factors for cardiovascular disease" (Myers, 2003).

The Improvements That Occur as a Result of Exercise

In Myers findings he was able to determine that exercise plays a great role in improving one's everyday life. For example, He mentions that participating in exercise can, "improve one's ability to transport and use oxygen" (Myers, 2003). This results in one being able to go about their day with less fatigue and more energy. He also mentions the improvement of one's aerobic

capacity through exercise which basically means that one is able to receive more oxygen throughout the body. This creates a positive impact on the body as it improves one's overall heart rate, blood pressure, and cardiovascular function. Overall, these factors help prevent cardiovascular diseases by improving the body's natural functions.

A Conclusion of the Findings

Overall, both articles share similar findings that regular exercise plays a crucial role in one's overall wellbeing and health which reduces the risk for a cardiovascular disease like CAD. This is because regular exercise creates psychological changes in the body as it improves blood flow, blood circulation, enhances endothelial cells, reduces inflammation, promotes insulin sensitivity, and a myriad of other positive benefits. As CAD has become highly prevalent among the country it is best to continue to become aware of the importance of exercise in one's everyday life. By staying informed and participating in a healthy and active lifestyle one can prevent their own risk for disease and educate others further reducing the unfortunate deaths caused by a sedentary lifestyle.

References

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