How Exercise Affects Morbidity in America

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Kinesiology 215

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September 20, 2018

Medicine is most commonly thought of as a drug to cure or treat an illness. Studies now show that exercise should be categorized as a type of medicine. Medical professionals have figured out that exercise can prevent, treat, and cure certain diseases. According to a study done by many health professionals, including Steven N. Blair, PED, “Higher levels of physical fitness appear to delay all-cause mortality primarily due to lowered rates of cardiovascular disease and cancer” (1989).  Hypertension, prediabetes, and obesity are prevalent in today’s society. These diseases can and will put a toll on the body; all of these diseases and many more could be treated with an activity as simple as walking every day. Ralph Paffenbarger was an epidemiologist that discovered that physical activity done every day can increase the lifespan of a human by ten percent. Furthermore, maintaining a sedentary lifestyle, less than thirty minutes of physical fitness a day, can increase cardiac risk by sixty percent.

There are three systems within the body that work with one another and can become badly diseased if there is a disfunction. The cardiovascular system is one of the main systems in the human body; it contains the heart, veins, and arteries which pump blood throughout the whole body and sends oxygen to tissues. Another system is the muscular system; it consists of all of the muscles in the body and allows movement. The third system is the pulmonary system, also known as the respiratory system; this system contains the lungs and controls how we breathe. All three of these systems work hand-in-hand: if one fails the others fail as well. For example, in order for muscles to perform, they need oxygen, but if the cardiovascular system is malfunctioning and blood is not sent through the body, then the muscular system is deprived of oxygen.  This causes the heart to have to work harder every time the muscles need oxygen and could end up leading to heart failure. Also, if the pulmonary system is malfunctioning then the body cannot inspire or expire air, so no oxygen flows to the muscles. A malfunction in one or more of these systems can cause disease because cardiorespiratory fitness levels will decrease, and as said before, a lifestyle with low levels of fitness can highly increase the risk of disease.

Low levels of physical fitness can result in a sedentary lifestyle. To be sedentary means to engage in less than thirty minutes of physical activity a day. Having a sedentary lifestyle is a risk factor for obesity, hypertension, and heart disease. The country is struggling with heart disease as it is one of the leading causes of death. In today’s society it is easy to become sedentary; most jobs only require computer work and kids sit in classrooms all day. This new life of little to no physical activity has put people at greater risk for heart diseases and many other morbidities. The answer to most of these diseases is not expensive medication, but rather it is exercise. Exercise puts stress on the heart and forces it to respond more efficiently. With daily exercise, the heart adapts by increasing its function and size based on the activity level. One fourth of the country is considered to be sedentary, and if they would understand that exercise can and will improve their bodies, especially the heart, then the mortality rates would decrease significantly.

The third leading cause of cardiovascular disease is hypertension.  This is a disruption in the amount of pressure the heart exerts on the cardiovascular system, specifically the blood vessels.  The cause of this starts with vasoconstriction of the arteries; this is a clogging of the arteries that results in an increase in blood pressure.  Moreover, the heart has to work harder to get blood through the veins and puts even more pressure on the arteries themselves. Ultimately, this pressure can lead to a rupture which causes aneurysms and strokes if it occurs in the brain.  When the endothelium ruptures and blood vessels tear, the immune system’s response is to deposit fats into the muscle cell. The fat builds up to fibrous plaque and creates a blockage. This process is known as atherosclerosis, a slow progressive disease that starts in early adulthood and develops gradually over decades.  Coming full circle, the more the plaque builds up, the harder the heart has to work, and the easier it is for the heart to eventually wear out and shut down. An even more dangerous disease is Coronary Heart Disease, because it affects the heart’s own circulatory system. If the arteries that supply the heart with blood or with oxygen, like the aorta, are blocked by atherosclerosis, then the muscles of the heart begin to die, and the heart fails all together, otherwise known as a heart attack.

To fix this problem, exercise is a major contributor to helping the blocked blood vessels vasodilate, and ultimately improving the heart’s efficiency.  The numerical measure of a normal blood pressure is between 120/80 mmHg and 140/90 mmHg. This is the systolic pressure, or pressure when the heart contracts or beats, over the diastolic pressure, the pressure on the system when the heart relaxes.  Exercise can increase the size of the heart’s chambers, which means it does not have to work as hard to pump blood through the blood vessels. Thus, avoiding the chance of raising the blood pressure levels to greater than or equal to 140/90 mmHg, which is considered hypertension. Some behaviors can also be avoided or changed to prevent the initial rupturing of blood vessels from high blood pressure.  One example would be an abnormal increase in heart rate. A normal resting heart rate is between 60 and 70 beats per minute while the maximum heart rate is 190, and that never changes. Heart rate can increase for many reasons such as exercise or stress, but the negative effects start occurring when the heart is not exercised properly and a rise in blood pressure follows. As people increase in age, they decrease the amount of exercise they get which ultimately increases their blood pressure.  Working a heart all throughout its lifespan will greatly affect how it functions with the body and ultimately lower blood pressure. The combination of vasodilation, increased heart size, and efficiency thanks to exercise decreases a person's risk of developing or having to continue living with a morbidity of the heart.

The issue of stress is that responsibilities increase with age which will raise blood pressure and, again, cause many defects with the cardiovascular system.  Fortunately, exercise releases endorphins into the brain which decreases stress. However, another issue with stress would be a disruption to the adrenal cortex, because it causes an increase in cortisol, the stress hormone.  An increase in cortisol stimulates lipogenesis which leads to improper eating, exercise, and sleep ranges; this then starts the whole process over again. Solutions to maintaining low stress levels include, but are not limited to, a balanced nutritional diet, a good exercise regimen, and getting between seven to seven and a half hours of sleep a night. So, physically vasodilating the blood vessels and strengthening the heart mixed with emotionally decompressing can have a positive effect on increasing lifespan and avoiding developing cardiovascular diseases.

Prediabetes is another risk factor for heart disease. Prediabetes is an inability to process carbohydrates in the body, also known as type two diabetes.  The body’s natural response to reducing carbohydrates is the process of GLUT4 translocation, where the GLUT4 protein aids insulin. However, people with type two diabetes do not have enough of this in their system to filter out all of the carbohydrates.  Exercise positively affects this system by improving energy, utilizing substrates, and mimicking the GLUT4 process. So, instead of spending millions of dollars on medicines to help with this already natural process, committing to a good exercise regimen would decrease the risk of developing this morbidity more and could even get rid of it.  People with a high chance of developing prediabetes also have what is called insulin sensitivity; this is the process of cells intaking glucose from the blood. Many behaviors affect this, but more specifically would be someone's sugar intake in their diet. Sugar sweetened beverages are the main culprit because they create an easy conversion from fructose, liquid sugar, to Glycerol, or Triglycerides, which are the backbone of long chain fatty acids.  Eight to nine percent of Americans’ calorie intake is sugar sweetened beverages and the problem is that our bodies cannot process the amount of sugar quick enough. Thus, it is one part of the human diet that could lead to the risk of developing diabetes.

Another problem with nutrition is, again, carbohydrate intake.  Behaviors that affect this include adrenal cortex disruption and stress hormone increase, lack of sleep, and TV time.  These activities, or lack thereof, all contribute to problems with satiety. They increase our ghrelin hormone, which tells us when we are hungry, and decrease our leptin hormone, which leads us to think we are never full.  This turns into compulsive and erratic dietary cravings for foods high in carbohydrates such as potatoes, chips, French fries, and refined grain. As our weight gain and calorie intake increases with an increase in sugar and carbohydrates in the body, we are more at risk to develop morbidities such as prediabetes.  Exercise will improve the state of the body significantly to deal with these problems, but some people will still need to make some major life changes to accommodate for the disease. Avoiding getting less than four hours of sleep each night will greatly decrease the chance of a disruption in the hunger hormones. Furthermore, decreasing television time by at least fifty percent has been shown to lead to a decrease in around two pounds per month.  Other things to avoid, which will decrease the chance of developing atherosclerosis, is alcohol, a high saturated fat diet, a high polyunsaturated fat diet, and a diet high in carbohydrates. However, it is hard to fix every person in America’s nutrition, because cultures all over the country eat different things that put them more or less at risk.

According to national morbidity rates, the main problem area in America, where the most people are at risk for developing morbidities, is in the South East.  Unfortunately, 35 percent of all Americans, 78.6 million people, are obese with a predisposition to morbidity. With that information, it is known that over 66 percent of Americans are overweight and that is the leading cause of preventable death.  Someone could extend their life simply by shrinking in size. For the southern areas of America, being overweight is becoming harder to avoid because of the amount of fatty, salty foods that they eat. Obesity and weight gain could lead to anything, but more specifically it leads to dyslipidemia and hypertension.  32 percent of Americans, 73.5 million people, have an unhealthy high cholesterol. The issue with dyslipidemia is that people are ingesting more Low-Density Lipoproteins (LDL) than they should be, and that is what clogs the arteries which leads to heart diseases. African Americans, Latinos, and the entire eastern shore of America are the most susceptible to this problem.  Lastly, 29 percent of Americans, roughly 3/10 adults, suffer from hypertension while only 50 percent of them actually have it under control. Of course, all of these diseases, no matter where you are in the country or even the world, are completely preventable with exercise.

The mortality rates in this country are rising because of morbidities, especially ones that revolve around the heart. These rates could be decreased drastically if the public knew that exercise is a form of medicine. Hypertension, sedentary lifestyles, obesity, and prediabetes could be prevented or treated by exercising on a daily basis. It has been proven by health professionals that exercise can increase the lifespan of a human by ten percent, but the lack of physical activity each day can result in a sixty percent increase in cardiac risk. With all this being said, a healthy heart is the key to a healthy life, and a healthy life is led by exercise.

Works Cited

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