Brampton: 220 Wexford Road Unit 2 Brampton, ON L6Z-4N7
Ph: (905) 840-WELL Fax: (905) 840 -LIFE
www.drjustineblainey.com
www.blaineywellness.com

Can Curcumin Boost the Benefits of Exercise?

By Dr. Mercola | September 22nd, 2017

Lining the walls of your arteries and veins are endothelial cells. The amount of connective tissue or smooth muscle surrounding each of your blood vessels will vary depending upon the location of the vessel and the function, but every single artery or vein is lined with a thin single layer of endothelial cells — called the endothelium — that play a unique and important function in your body.

Despite the fact your endothelium is composed of only a one-cell-thick lining in your blood vessels, taken together they weigh just over 1 kilogram (2.2 pounds), and laid end to end could wrap around the Earth four times. These cells are multifunctional as a paracrine and endocrine organ, secreting hormones that affect cells in the immediate area and throughout your body.

Endothelial cells are vital and affected by several factors, including specific nutrients and exercise. Research demonstrates the addition of curcumin with exercise may increase benefits to your endothelial cell function and improve the function of your heart.

Endothelial Function Is at the Heart of Many Dangerous Diseases

Your endothelial cells line vessels from your heart to the smallest capillaries that feed your body's cells and organs. These cells control the permeability of your vessels, allowing white blood cells to pass into and out of the bloodstream. Each cell has receptors that sense the stress of blood flow over the surface. Your endothelial cells then signal this information to your surrounding cells in order that blood vessels may adapt to accommodate the flow.

Your endothelial cells are also capable of movement and cell division to protect areas of the vessel walls that may become damaged. In this case, neighboring cells multiply and move to cover the exposed area. This occurs not only in existing vessels, but the cells also create new blood vessels. For example, during a woman's menstrual cycle, endothelial cells are responsible for reconstructing the uterine lining each month.

This proliferation occurs not only during normal bodily processes, but also in cases where the body is injured. After a cut, your endothelial cells trigger a burst of capillary growth in the area to support the repair process. A localized infection may also increase capillary growth that recedes when the inflammation diminishes. These cells are also involved in the regulation of hemostasis, or stopping the flow of blood through clotting, and in regulating the flow of blood through your vessels.

Endothelial cells play a role in your immune system, in coagulation after wounding, and in the production of the extracellular matrix, or noncellular components present in most tissues that provide a physical framework and initiate vital biochemical cues required for tissue differentiation. Additionally, they take part in cells' reactions to physical or chemical stimuli and in metabolic functions to regulate vasomotor tone and inflammatory response.

Based on the function of the endothelial cells in your arterial and venous system, it should come as no surprise that dysfunction is related to a number of dangerous health conditions, including atherosclerosis, hypertension and Type 2 diabetes and a significant reduction in nitric oxide (NO) production.

Exercise Improves Endothelial Function and Health

The effect of exercise on your overall health has been well-documented and studied. The specific effect exercise has on endothelial function speaks to the mechanism behind clinical improvements you may experience. For instance, exercise boosts blood flow and stress on the arterial walls, both of which results in an increase in NO production and bioavailability. Consistent exercise may have the effect of reducing cardiovascular disease by preserving or improving endothelial function.

Research has demonstrated the benefits to your endothelial function and NO production in just one bout of moderate aerobic exercise. This means that while consistent exercise is best, it is never too late to experience the benefits of exercise to your blood vessels. Individuals with chronic diseases such as systemic lupus erythematosus or cardiovascular disease also experience the benefits of exercise on their endothelial function.

The benefits of exercise are not permanent, however. Just as one bout of exercise boosts your endothelial function, research demonstrates that once you stop exercising you do not continue to enjoy the benefits of past efforts. In a study of 209 people who all experienced a heart attack, researchers evaluated endothelial function before and after four weeks of exercise training and then again one month later, after the participants were asked to stop exercising.

The participants were randomized into groups that underwent aerobic training, resistance training, resistance and aerobic training, or no training. Predictably, those who did no training experienced no improvement in their endothelial function. However, the improvement to function in the other three groups was independent of the type of exercise they did. In other words, all three groups experienced the same degree of improvement and all lost this improved function after one month of detraining.

These benefits may be related to the role your endothelial cells play in relaxing your blood vessels and lowering your blood pressure in response to blood flow. The force generated across the endothelium with increased blood flow may be necessary for the release of vasoactive chemicals, helping to preserve endothelial cell stability and function.

Combination of Exercise and Curcumin May Improve Your Endothelial Function

Pharmaceutical companies have tried to produce anti-inflammatory pills that might have the same effect, thus increasing their revenue stream. These companies are banking on finding a group who would rather take a pill than make lifestyle changes. However, a pill affects only one factor — reducing inflammation — often accompanied by a laundry list of dangerous side effects, while making lifestyle changes affects your whole health.

One of the most anti-inflammatory foods known is turmeric. A number of studies have been done on curcumin, the yellow coloring in the spice turmeric. In one study, researchers from Japan compared the effects of about a teaspoon of curcumin per day to 30 to 60 minutes of exercise. Both groups experienced improved endothelial function.

Another study evaluated hemodynamics in the central arteries, as impairment of the endothelium may lead to stiffening of the arteries or atherosclerosis. In this study the researchers found the combined effect of taking curcumin and exercise was to reduce left ventricular afterload in the subjects. The researchers commented:

> *"The magnitude of the improvement achieved by curcumin treatment was comparable to that obtained with exercise. Therefore, regular ingestion of curcumin could be a preventive measure against cardiovascular disease in postmenopausal women."*

Afterload is the resistance the heart must overcome to eject blood through the aortic valve. By reducing left ventricular afterload, the stress on the heart muscle declines, decreasing the potential risk for left ventricular hypertrophy and reducing blood pressure. The underlying mechanism behind endothelial dysfunction is directly or indirectly related to oxidative stress that reduces the bioavailability of NO.

Prolonged Sitting May Damage Your Arteries by Triggering Endothelial Dysfunction

The dangers from prolonged sitting are well-documented in the literature. Your body was designed for movement, with nearly 300 joints meant to help your body move in directions through three planes. Extended sitting makes active changes in your body that promote Type 2 diabetes, obesity and cardiovascular disease, even if you work out daily and are very fit.

These conditions increase your risk for premature death.

Millions of people suffer the effects of sitting for long periods. It's estimated that most Americans will sit between eight and 15 hours each day. This is time spent commuting back and forth to work, sitting behind a desk all day and watching television at night. In fact, unless you track the time you sit, you may be surprised by the number of hours you spend in the seated position.

A recent study published in the Annals of Internal Medicine found the amount of time you spend sitting is directly related to your risk of developing cardiovascular disease, Type 2 diabetes, cancer and experiencing premature death, despite the amount of exercise you get each day. The study evaluated over 8,000 participants to make these conclusions. The good news from this study is that those who sit for less than 30 minutes at a time had the lowest risk of an early death, nearly 55 percent less than those who sit for longer periods.

Lead author, Keith Diaz, Ph.D., a research scientist from Columbia University Department of Medicine, believes simple guidelines to "exercise more" are not specific enough to be useful. He commented:"We think a more specific guideline could read something like, 'For every 30 consecutive minutes of sitting, stand up and move/walk for five minutes at a brisk pace to reduce the health risks from sitting.'"

Within one hour of sitting without moving, blood begins to pool in your lower extremities and pelvis, triggering changes to your endothelial function. Researchers found participants only had to sit for one hour before changes in venous pooling in the calf and a decrease in calf blood flow was noted. These changes resulted in an increase in arterial pressures and minor changes in heart rate and cardiac output. Diaz went on to comment on another pathway that prolonged sitting affects, saying:

> *"There is evidence that suggests, but does not prove, that it could be about how our body handles blood sugar. We think it's through a kind of diabetic pathway. When our muscles are inactive, they are not using blood sugar, and we know that blood sugar can wreak terrible consequences on our body. Poor blood sugar control is thought to be one of the ways sitting increases one's risk for heart disease or death."*

How to Incorporate Turmeric in Your Nutritional Plan

Decades of damage to human health from pharmaceutical drugs have taught that there is no single magic bullet to make you, or keep you, healthy. Instead there are multiple choices you make every day that ultimately affect your risk for disease. Incorporating exercise and curcumin into your daily regimen are two positive choices.

I highly recommend that you sit for no longer than 15 minutes before getting up to stretch and walk for three to four minutes. Incorporate the Nitric Oxide Dump exercise I demonstrate in the video above during three of those periods, being sure that you allow for at least two hours between sessions.

As curcumin is one of the chemicals found in turmeric, and consumption of the entire plant often affords the benefit of nutrients working synergistically, I recommend considering adding turmeric to your garden. The health benefits from turmeric not only include supporting your endothelial function and reduced cardiovascular disease, but are also associated with a reduced risk of Alzheimer's disease, cancer, Parkinson's disease and osteoarthritis. It may also help wound healing and protect against cataracts and liver damage.

You can grow turmeric in your backyard or in indoor containers. The plants take about 10 months to mature. Fresh or dried root may be used for meat rubs or marinades, chopped fresh and added to your salad or used in a ginger and turmeric latte.