Weight Loss and Endothelial Dysfunction

Only 4 kilos of Weight Gain in Lean Adults Increases Heart Disease Risk

Researchers have long known that obesity is tied to an important cardiovascular disease risk factor known as endothelial dysfunction. This refers to dysfunction in the endothelium, the layer of cells lining the blood vessel walls. Disturbing new research, however, by Mayo Clinic researchers indicates that even small weight gain in lean, healthy adults can result in endothelial dysfunction, putting these otherwise healthy subjects at an increased risk for heart disease.

In this article, we will discuss the results of this new study and address a two-pronged approach that can be used for both weight management and maintaining healthy blood vessels. First, though, we will explain the importance of the endothelium in cardiovascular health.

Endothelial Dysfunction

Endothelial cells are the cells that line the blood vessels. When there is damage to the endothelium—the blood vessel lining that contains these cells—it can obstruct blood flow, leading to heart attacks and strokes.

The endothelium plays a crucial role in regulating vascular function and structure. In healthy conditions, nitric oxide produced by endothelial cells exerts not only vasodilating (blood vessel widening) properties, but also several other protective actions toward the vessel wall against the development of atherosclerosis and thrombosis. Traditional cardiovascular risk factors are characterized by endothelial dysfunction caused by an enhanced production of oxidative stress that reduces the availability of nitric oxide.

Endothelial dysfunction represents the earliest abnormality in the development of vascular disease. It is linked to subsequent atherosclerosis progression and cardiovascular disease events.

Arterial endothelial dysfunction occurs at all stages of atherosclerosis, both preceding structural atherosclerosis changes, as well as before cardiac events in late obstructive disease. Thus, the link between endothelial dysfunction and risks of vascular events such as heart attacks and strokes is well established.

Endothelial dysfunction plays a central and critical role in other aspects of cardiovascular disease including the initiation and development of idiopathic pulmonary arterial hypertension (IPAH) and angina.

Endothelial dysfunction is thought to play an important part in the increased risk of heart disease in rheumatoid arthritis patients and may explain the high prevalence of cardiovascular disease found in people with the metabolic syndrome and diabetes.

In human subjects, researchers usually measure endothelial function by measuring what's known as flow mediated dilatation, a technique that is less invasive than other possible ways to measure endothelial function. Tracking flow mediated dilatation is a non invasive ultrasound-based method that researchers can use to measure arterial diameter and blood flow in the vessels.

Minor Weight Gain Increases Heart Disease Risk

For many years researchers have investigated how obesity can wreak havoc on the endothelium. However, a new study indicates that it doesn't take a lot of weight gain—as little as 4 kilos of visceral fat in lean, healthy subjects—to cause endothelial dysfunction and increase the risk of heart disease.
Mayo clinic researchers conducted a randomised, blinded, controlled trial to investigate how weight gain and subsequent weight loss affected endothelial function. The study authors recruited 43 lean, healthy volunteers (average age 29 years) who each had a body mass index (BMI) of between 18.5 and 24.9. Forty-two percent of the subjects were women. All subjects were non-smokers and none were on medications. After a weight maintenance period supervised by an experienced dietician, volunteers randomly were assigned into a group of 35 people who gained weight (about 4 kilos) or a group of eight subjects who maintained their weight.

The scientists measured endothelial function in the subjects by determining flow-mediated dilatation in the brachial artery, a large vessel in the upper arm. The measurements were always taken at the same time each day, in the early morning. In the weight gain group, researchers measured endothelial dysfunction at the study’s start, after the subjects gained fat at 8 weeks, and after weight loss at 16 weeks. In subjects who maintained their weight, endothelial function was measured at the study’s start and at 8 weeks. Low flow indicated vessel dysfunction.

At the conclusion of the study, the subjects who had gained an average of 4 kilos experienced a significant increase in their visceral fat (the abdominal fat surrounding internal organs) and subcutaneous fat found just under the skin. In these subjects, the brachial artery flow measurements decreased as weight was gained. The endothelial dysfunction noted in these subjects appeared to be related to a specific type of weight gain, notably visceral fat gain rather than subcutaneous fat gain. Once the weight was lost, endothelial function was restored to levels measured at the beginning of the study.

In the group who maintained their weight, endothelial function remained unchanged. According to the Mayo Clinic researchers who conducted the study, "In lean healthy young subjects, modest weight gain results in impaired endothelial function, even in the absence of changes in blood pressure. Endothelial function recovers after weight loss. Visceral rather than subcutaneous fat predicts endothelial dysfunction."

This study sheds new light on the small amount of weight gain that many individuals consider to be a normal part of ageing.

**Weight Loss and Healthy Blood Vessels**

Since the individuals in the above study were able to restore the health of their blood vessels once they lost the weight, the first step in maintaining cardiovascular health would be to shed even small amounts of weight gain.

**ZLIM/TRIM** is the perfect option to do away with excess weight.

ZlimTrim contains exceptional ingredients such as Synephrine
Hydroxycitric acid (HCA) Garcinia
0.5–2% E & Z Gugulesterones, forskolin and more

This high potency weight loss supplement not only works to suppress appetite and increase caloric expenditure but it also treats the side effects of weight loss such as loss of energy, irritability and cravings.

For patients with carbohydrate cravings, insulin resistance and midriff fat prescribe ZLIMTRIM with NT2. Practitioners have reported great results with this combination.

**Strengthening Blood Vessels**

An effective two-part approach to improving cardiovascular health must go beyond weight loss and also restore endothelial function. Fucoidan—a sulfated polysaccharide extracted from brown seaweed—is now thought to have a role to play in endothelial repair by virtue of its ability to increase the activity of stem cells that repair cardiovascular damage. Studies have begun to emerge indicating fucoidan might influence the mobilization of endothelial stem cells and their incorporation into ischemic tissue. By mobilizing the endothelial cells to sites of blood vessel damage, fucoidan can strengthen the vessels and improve cardiovascular health.

Recent studies suggest that fucoidan may work by enhancing the activity of stromal- derived factor 1 (SDF-1), which plays a critical role at several steps of progenitor (stem) cell mobilization. Researchers reporting in the journal Blood recently discovered that plasma concentrations of the highly potent SDF-1 increased rapidly and dramatically after treatment with fucoidan in monkeys and in mice, coinciding with decreased levels in bone marrow. In vitro and in vivo data suggest that fucoidan displaces certain factors that normally trap the SDF-1 in bone marrow, on endothelial cell surfaces or other tissues, helping to release the SDF-1 and allowing it to more easily mobilize the stem cells. The researchers tested other mobilizing agents to see if they would have the same effect but fucoidan was the only substance tested able to increase SDF-1 activity and enhance stem cell mobilization to sites of injury.

Numerous in vitro and animal studies have shown that fucoidan can strengthen the blood vessels by interacting with endothelial cells, producing anticoagulant effects. Studies have shown that fucoidan inhibits vascular smooth muscle cell growth to the same extent as heparin and that it can help endothelial cells migrate to the site of blood vessel injuries. Fucoidan has been shown to act in the same way as heparin with a mechanism of action that involves regulating tissue factor pathway inhibitor (TFPI), a process that is involved in blood coagulation. Fucoidan causes the endothelium to release TFPI, resulting in anti-coagulant effects.

The results of these studies led researchers to conclude, "Moreover, the data already suggest a potential role of fucoidan as a new therapeutic agent of vegetal origin in the vascular endothelium wound repair."
Panaxea's LECTIN CONTROL contains high levels of fucoidan alongside several other complementary ingredients. Fucoidan's health benefits are not just limited to blood vessel health; research has shown it to help with the following functions as well:

- Enhance immunity
- Relieve stomach disorders
- Fight allergies
- Improve and support liver function
- Inhibit blood clotting
- Fight against free radicals
- Lower cholesterol levels
- Promote healthy skin
- Decrease high blood pressure
- Stabilize blood sugar level
- Cancer

Conclusion
The surprising new study by Mayo Clinic researchers indicated that lean subjects who gain even a small amount of weight could suffer blood vessel damage. Therefore, individuals who want to maximize their heart-protection supplement regimens can focus on weight loss goals and improving the health of the endothelium with fucoidan. Furthermore, consuming a good multivitamin and/or antioxidant supplement can provide synergistic support as substantial research exists to show that vitamins C as well as other antioxidants can inhibit the free radical damage and other factors involved in endothelial dysfunction.

References

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