

An Under-Recognized Enemy to Cardiovascular Health

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We all know that smoking, high cholesterol levels and obesity are bad for our hearts. However, although many people have never heard of fibrinogen, a high level of the protein fibrinogen in the blood is rapidly coming to light as the latest enemy to good cardiovascular health. In a study in the journal *Circulation*, researchers discovered that high levels of this dangerous protein in the blood not only put individuals at risk for heart disease, but can amplify the hazards of other standard heart attack risk factors such as smoking, obesity, and high cholesterol.¹

Heart Disease 101

Heart disease has been the leading cause of death in the United States since 1921, and stroke has been the third leading cause since 1938. Together they account for approximately 40 percent of all deaths.² This epidemic of heart disease led a surge of research studies in the 1940s to establish the major risk factors for heart disease that included: high blood cholesterol, high blood pressure, smoking and dietary factors (particularly dietary cholesterol, fat, and sodium) in addition to socioeconomic status, obesity, and physical inactivity.³⁻⁸ Yet these early detected factors are but the tip of the iceberg when it comes to protecting your cardiovascular system. To worry only about your weight or cholesterol would be like washing your car and thinking you are prepared for a cross-country road trip.

Cholesterol is a risk factor that merits our attention and we should definitely strive to prevent it from becoming exceedingly elevated. In fact, cholesterol is really just one chapter in the full heart health story. We now know that substances in the blood other than cholesterol contribute significantly to cardiovascular disease and serve as triggers for potentially catastrophic events such as heart attacks and strokes. These substances include fibrinogen, homocysteine and C-reactive protein (CRP).

Fibrinogen is of particular concern because its presence creates the inherent possibility of developing clots and damaging the cardiovascular system. Let's take a closer look at this missing link called fibrinogen.

Fibrinogen and Beyond

One person dies every 33 seconds in America from cardiovascular-related disease. Even with all the advances in medicine and all the television commercials for this drug or that drug to lower cholesterol, blood pressure, etc., we are still a nation dying prematurely and to a very large part unnecessarily. Heart disease and stroke remain leading causes of disability and death. The economic cost in the US from cardiovascular disease incorporating healthcare costs and lost productivity was approximately \$290 billion in 1999-10. To keep ourselves and our loved ones from becoming just another statistic, we must stack the odds in our favor. When it comes to your cardiac risk factor numbers, "Test Don't Guess" because what you don't know can literally kill you.

What is fibrinogen? It is a protein necessary for normal blood clotting that is synthesized by the liver. Studies have concluded that high levels of fibrinogen increase blood clotting and increase risk for having heart disease and strokes. People with diabetes or those who are overweight or sedentary have higher levels of fibrinogen. In today's modern world of desk jobs, commuting to work instead of walking and the recreation of the remote control we are a nation that sits around a lot more than a generation

ago. Consequently, we are all more sedentary and at greater risk. Smoking also is associated with raised fibrinogen levels, which return to normal when smoking is stopped.

Stress and Fibrinogen—A Potentially Dangerous Combination

A powerful study, demonstrating the dangers of fibrinogen, was reported in the *Journal of Occupational and Environmental Medicine*. Researchers looked at the link between job stress, job control, and social support and markers of inflammation and infection in a group of 892 male workers in Belgium. It was concluded that the results help explain the well-known link between stress and heart disease, which cannot be explained by traditional heart disease risk factors, such as high cholesterol and blood pressure. The researchers suggested that inflammation may be the pathway by which high stress leads to an increased risk of heart disease. The link between lack of job control and elevated fibrinogen levels remained significant after taking into consideration other variables such as age, occupation, use of cholesterol or blood pressure medication, smoking, and alcohol use.¹¹

Fibrinogen—More than Just Another Protein

A full twenty years ago it was reported in the medical literature that fibrinogen was an independent risk factor for cardiovascular disease. In one study, researchers looked at participants of the Framingham Offspring Study, an evaluation of risk factors for heart disease that has been ongoing since 1948, to see if those people with heart disease had higher fibrinogen levels than the rest of the population. This study makes it clear that even though fibrinogen is not as widely known as cholesterol, it is a public enemy #1. In 1987 during the tenth biennial examination of the Framingham Study, 1,315 participants who were free of cardiovascular disease had fibrinogen levels measured. The researchers found that the risk for coronary heart disease was significantly related to the fibrinogen level. In fact, the impact of fibrinogen value, considered as a separate variable, on cardiovascular disease was comparable with the major risk factors, such as blood pressure, hematocrit, adiposity, cigarette smoking, and diabetes. Fibrinogen values were also significantly related to these risk factors. Taking all these into account, fibrinogen level was still significantly related to the incidence of cardiovascular disease in men and marginally significantly in women. For coronary heart disease, the fibrinogen level was significant for both men and women. The researchers concluded, “Elevated fibrinogen level is a predictor of cardiovascular disease that should be added to the cardiovascular risk factor profile.”¹²

Clot Formation

Why should we be concerned about fibrinogen levels if we are “healthy”? Even in healthy people fibrinogen levels rise by 25 mg/dl per decade.¹³ There are several pathways by which acute or chronic increase in fibrinogen levels can lead to cardiovascular and cerebrovascular disease and life-threatening events such as heart attack and stroke including increased platelet clumping and blood clot formation, and increased fibrin formation.¹⁴

A clot, known as a thrombus, forms when platelets and red blood cells clump together. It is the blood protein fibrin that causes them to stick together. Fibrin is formed at the site of a clot from the soluble circulating protein fibrinogen. If the clot forms at the site of a broken or cut blood vessel, it is an advantage to the body and can even save your life. If the clot forms inside a blood vessel in the absence of a wound or trauma, it is unnecessary and can become life threatening, since it may plug up a crucial heart or brain artery. There are more than 20 enzymes involved in the blood clotting process that creates clots, but only one enzyme, “plasmin” can dissolve fibrin and break up small clots.

High fibrinogen levels increase the risk of spontaneous clot formation. High fibrinogen (and thus implicitly, high fibrin) levels are such a serious risk factor for heart attacks and strokes that one major study of 2,116 men found that those who had high LDL (“bad”) cholesterol—but low fibrinogen levels—had only one-sixth the heart attack risk of men with high LDL and high fibrinogen levels.¹⁵

Natural Approaches To Fibrinogen Control

Nattokinase

Made from fermented soybeans, Nattokinase is a natural component of the soy food natto. It has been routinely consumed in Japanese cultures for hundreds of years.¹⁶⁻¹⁷ Natto arises via a natural fermentation process after soybeans are boiled. Therefore, Nattokinase isn’t a component of other soy foods. Nattokinase was discovered by a University of Chicago researcher, Dr. Hiroyuki Sumi. He referred to it as “The Enzyme of Enzymes.”

Nattokinase is a fibrinolytic enzyme (breaks up fibrin). Nattokinase has fibrinolytic activity that is 4-times more potent than plasmin.¹⁸ Nattokinase is thought to help for atherosclerosis due to its fibrinolytic activity at the blood vessel wall. There is preliminary evidence from animal models that taking a natto extract containing Nattokinase can reduce vessel wall thickening following blood vessel wall damage. Nattokinase, according to preliminary findings, also appears to help break up clots that form at the vessel wall.¹⁹⁻²⁰ According to research, taking enteric-coated Nattokinase capsules 1.3 grams three times per day seems to significantly increase measures of fibrinolytic activity for 2 to 8 hours. Researchers have identified how Nattokinase works, which is via its ability to inactivate plasminogen activator inhibitor 1 (PAI-1).²¹

Serrapeptase

Another naturally occurring enzyme from Asia, Serrapeptase is a proteolytic enzyme originally isolated from the silk worm. It is this enzyme that silk worms use to escape the protein rich silk cocoon. Hence the term “proteo” meaning protein and “lytic” meaning to cleave or break, hence “proteolytic” to break or cleave protein. Serrapeptase has been shown in studies to possess anti-inflammatory, antiedemic (anti-swelling), and fibrinolytic effects.²²⁻²³ Clinically serrapeptase is often used with nattokinase to decrease pain and inflammation, by inhibiting release of bradykinin and other factors from inflamed or damaged tissue.²⁴ Serrapeptase is also thought to help break down of proteinaceous secretions and therefore facilitate elimination of excessive secretions. (Serrapeptase also seems to decrease sputum viscosity and decrease white blood cell (neutrophils) in the sputum of patients with chronic airway disease. Serrapeptase appears to be absorbed from the gastrointestinal tract when taken orally.

Turmeric Extract (Curcuma longa)

This powerful antioxidant can be used along with Nattokinase and Serrapeptase to help support healthy fibrinogen levels. Scientists from Spain have demonstrated that turmeric dramatically lowers fibrinogen levels in humans. In one study, subjects with elevated fibrinogen levels who were treated with 20 mg of turmeric extract per day for 15 days experienced a significant drop in their previously elevated levels of fibrinogen.²⁵ After a review of the medical literature published two years later, the Spanish scientists also concluded that in healthy human subjects, the intake of 200 mg of turmeric

extract per day results in a normalization of the plasma levels of fibrinogen. It also resulted in a decrease in HDL and LDL-lipid peroxidation, the process where free radicals oxidize lipids in the body and turn them rancid.²⁶

Clot-Busting Cautions

Nattokinase, naturally present in and absorbed from natto, has been consumed safely in Japan for a thousand years. Serrapeptase has been safely and widely used in Europe and Asia for more than 30 years. They are helpful in preventing or reversing the pathological hypercoagulation tendencies common among modern Americans.

Yet not everyone should take Nattokinase and/or Serrapeptase (NKSP). People with bleeding disorders, such as hemophilia or a group of diseases called “hemorrhagic diathesias,” should not use this natural product. People with ongoing bleeding problems, including ulcers, recent surgery, recent major trauma, or hemorrhoids also should not use Nattokinase or Serrapeptase. Anyone who has ever suffered intracranial (brain) bleeding, or who has had neurosurgery or ischemic stroke in the previous six months, should also avoid NKSP. Severe uncontrolled high blood pressure is also a contraindication for NKSP. Last, those taking blood-thinning drugs should use NKSP only if advised and carefully monitored by their prescribing physician.

Conclusion

Protecting your heart means more than just worrying about your total cholesterol level reading. It is imperative to have your health care provider measure your fibrinogen levels and also the all too often forgotten homocysteine and C-reactive protein levels. By taking charge of your health and being proactive, you will not be forced to pursue “reactive medicine” in the hopes of a life-saving intervention.

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