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AS WE SEE IT

Inflammation and Heart Disease

A growing consensus amongst scientists is that common disorders such as atherosclerosis, colon cancer and Alzheimer's disease are all caused in part by a chronic inflammatory syndrome.

The New England Journal of Medicine recently published three articles showing that the presence of blood indicators of inflammation are strong predictive factors for determining who will develop coronary artery disease and suffer cardiac-related death.(1-3)

The good news is that many of the supplements used by Life Extension Foundation members appear to suppress these dangerous inflammatory components of blood.

One of the inflammatory markers the *New England Journal of Medicine* identified is a protein called fibrinogen. High fibrinogen levels can induce a heart attack via several mechanisms, including increased platelet aggregation, hyper-coagulation and excessive blood thickening. The New England Journal of Medicine studies showed that those with high levels of fibrinogen were more than twice as likely to die of a heart attack.

Another inflammatory marker reported on was C-reactive protein. This marker indicates an increased risk for destabilized atherosclerotic plaque and abnormal arterial clotting. When arterial plaque becomes destabilized, it can burst open and block the flow of blood through a coronary artery, resulting in an acute heart attack. One of The New England Journal of Medicine studies showed that people with high levels of C-reactive protein were almost three times as likely to die from a heart attack.

Why cardiologists are so slow to react

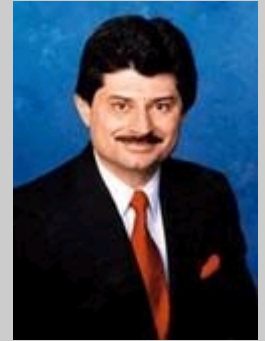
It was back in 1996 that The Life Extension Foundation published an article showing that high levels of fibrinogen represented a significant risk factor for heart attack and ischemic stroke.(4) The Foundation's based its report on studies dating back to the 1980's showing that people with elevated fibrinogen levels were more likely to die from a cardiovascular-related disease.

Despite numerous studies linking elevated fibrinogen to increased heart attack risk, few doctors bother to check their patients blood levels of fibrinogen or other correctable risk factors such as homocysteine and C-reactive protein.

When The Life Extension Foundation challenges physicians to incorporate these published findings into their clinical practice, a common response from doctors who appreciate the importance of these tests is that managed care (HMOs and PPOs) refuse to pay for them. Other doctors demand a higher standard of proof before they test their patient's blood for what they consider to be "newly identified" cardiac risk factors.

The sad fact is that the majority of practicing physicians are not even aware of these documented methods of measuring cardiovascular risk factors such as C-reactive protein, fibrinogen and homocysteine in the blood.

As a result of physician ignorance or insurance company stinginess, many Americans suffer progressive debilitating congestive heart failure or cerebral circulatory impairment when the underlying causes could be corrected if the physician ordered and properly interpreted these blood tests.



William Faloon



Correcting inflammatory risk factors

Cardiovascular risk factors such as fibrinogen and C-reactive protein are produced in the liver by pro-inflammatory cytokines called interleukin-1B, interleukin-6 and tumor necrosis factor alpha.(4) For many years, Life Extension members have taken supplements such as DHEA to suppress excess production of some of these dangerous cytokines.

One recent study showed that interleukin-6 by itself increased the risk of heart attack, even after adjustment for the elevation in C-reactive protein induced by interleukin-6.(3) Both vitamin K and DHEA suppress interleukin-6, which helps explain why these supplements have been shown to protect against such a wide range of age-related diseases.(6-8)

As far as suppressing the dangerous tumor necrosis factor alpha and interleukin-1B cytokines, nettle leaf extract appears to be the most effective dietary supplement.(9-10) Nettle leaf extract is found in two popular formulas used by Foundation members.

Protect against fibrinogen-induced heart attack

Agents that inhibit platelet aggregation reduce the risk that fibrinogen will cause an abnormal arterial blood clot. Platelet aggregation inhibitors include aspirin, green tea, ginkgo, garlic and vitamin E.(11-21) For optimal protection against the formation of arterial blood clots, it makes sense to utilize therapies that directly lower elevated fibrinogen levels.

High serum vitamin A and beta-carotene levels have been associated with reduced fibrinogen levels in humans. Animals fed a vitamin A deficient diet have an impaired ability to break down fibrinogen. When animals are injected with vitamin A, they produce tissue plasminogen activator (tPA), which breaks down fibrinogen.(22-29)

High doses of fish or olive oil have been shown to lower fibrinogen in humans with elevated fibrinogen levels.(30-31) Excessive homocysteine blocks the natural breakdown of fibrinogen by inhibiting the production of tissue plasminogen activator (tPA).(32) Folic acid, TMG, vitamin B12 and vitamin B6 reduce elevated homocysteine levels.

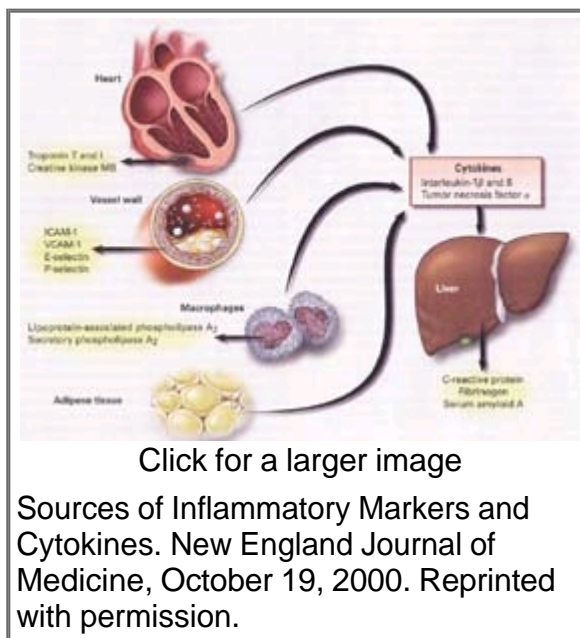
Vitamin C, in pharmacological doses, has been shown to break down excess fibrinogen. In one study, heart disease patients were given either 1000 mg or 2000 mg a day of vitamin C to measure the fibrinogen breakdown effect.

At 1000 mg a day, there was no detectable change in fibrinolytic activity or cholesterol. At 2000 mg a day of vitamin C, there was a 27% decrease in the platelet aggregation index, a 12% reduction in total cholesterol and a 45% increase in fibrinolysis (fibrinogen breakdown) activity.(5)

An additional marker of heart attack risk

Troponin T is a blood marker of heart muscle damage. A recent study showed this marker is the most powerful long-term predictor of cardiac death in those suffering from underlying heart disease. Compared to patients with the lowest levels of troponin T, those with the highest troponin T blood levels were almost 13 times more likely to die over a 37-month period.(2) Why is troponin T such a powerful predictor? It turns out that even those with a minor elevation of troponin T have a larger number of tiny coronary artery blood clots, complex atherosclerotic coronary artery lesions and impaired coronary artery blood flow. Those with elevated troponin T levels, therefore, are the heart attack patients most likely to benefit from antiplatelet and antithrombotic therapies.

The type of "troponin" blood test preferred by most clinical laboratories is called Troponin I." The Troponin I test is considered a more stable and predictable method of measurement in those with existing cardiovascular disease than troponin T.



As The Life Extension Foundation forges ahead in identifying better methods of protecting against degenerative disease, it has become increasingly apparent that members will have to take a more active role in protecting their health. That means those who are concerned about optimal health are going to have to stand up to their doctors and demand that certain blood and other diagnostic tests be performed, whether their physician agrees with them or not! It is high time that humans stop sacrificing their lives because of the inability of doctors and insurance companies to recognize diagnostic approaches that are substantiated in respected medical journals.



For members who are unable to secure physician-insurance company cooperation, we are pleased to announce that the cost of blood testing has come down considerably. Since 1996, Life Extension members throughout the United States have been able to order their own tests directly from the Foundation. This mail-order blood testing has enabled members to identify underlying risk factors that if corrected in time, could prevent a lethal disease from developing or worsening.

A medical center that will practice scientific medicine

While blood testing is important, so is comprehensive medical care that evaluates every diagnostic test result to bring each individual to an optimal state of health. The failure of managed care to provide holistic healthcare, based on what is already published in mainstream medical journals, is one of the purposes for establishing The Life Extension Medical Center, which is scheduled to open in Ft. Lauderdale, Florida in early 2001.

At The Life Extension Medical Center, the results of studies that are published in peer-reviewed medical and scientific journals will be used to develop novel approaches to prevent and treat the diseases of aging. It is our contention that managed care, physician apathy and FDA over-regulation is a lethal combination that is causing over one million Americans to needlessly die every single year. We believe the innovative approaches that will be practiced at The Life Extension Medical Center will save many lives.

In the meantime, those with chronic degenerative disease should take a pro-active role in their health care. If your physician does not appear to care about keeping you in an optimal state of health, find another doctor! Don't become a victim of the current broken-down healthcare system that fails to incorporate scientific findings into the clinical practice of medicine.

In this issue of Life Extension, we present detailed findings about a highly promising anti-aging supplement. In preparing these articles, we reviewed a huge number of published studies in order to validate this novel scientific approach to help prevent the multiple pathological disorders involved in aging.

For longer life,

William Faloon
Life Extension Foundation

Testing your blood to avoid cardiovascular disease

Don't let complacent doctors put you at risk for heart disease and stroke. The following chart shows the most common blood tests that can help reveal underlying cardiovascular disease risk factors.

As can be seen on the chart below, blood test results that conventional doctors accept as being "normal" can be lethal to you. In other words, what the "Standard Reference Range" allows is not always a practical indicator for where your "optimal" level should be.

In many cases, a "Standard Reference Range" reflects what is expected to be seen in the average population. Since cardiovascular disease remains the number one killer of Americans, you don't ever want to be part of the "average" range when it comes to cardiovascular disease risk factors.

By keeping your blood levels in the "Optimal Range," rather than the average "Standard Reference Range," you take advantage of the increasing volume of evidence showing that most heart attacks and strokes are preventable.

As you can see, the "Standard Reference Range" often dangerously differs from what the published research indicates is

protective against cardiovascular disease.

Blood Test	What The "Standard Reference Range" Allows	The "Optimal" Level Where YOU Want To Be
Fibrinogen	Up to 460 mg/dL	Under 300 mg/dL
C-reactive protein	Up to 4.9 mg/L	Under 2 mg/L Some studies indicate C-reactive protein levels should be below 1.3 mg/L(33,34)
Homocysteine	Up to 15 micro mol/L	Under 7 micro mol/L
Glucose	Up to 109 mg/dL	Under 100 mg/dL
Iron	Up to 180 mg/dL	Under 100 mcg/dL
Cholesterol	Up to 199 mg/dL	Between 180-220 mg/dL
LDL cholesterol	Up to 129 mg/dL	Under 100 mg/dL
HDL cholesterol	No lower than 35 mg/dL	Over 50 mg/dL
Triglycerides	Up to 199 mg/dL	Under 100 mg/dL
DHEA	Males: No lower than 80 mcg/dL	Between 400-560 mcg/dL
	Females: No lower than 35 mcg/dL	Between 350-430 mcg/dL

*There are numerous published studies indicating that cholesterol levels should ideally be under 200. The Life Extension Foundation believes it is more important to concentrate on suppressing dangerous LDL cholesterol and increasing beneficial HDL levels. If other risk factors such as homocysteine, fibrinogen, C-reactive protein, etc. are individually adjusted to reflect "optimal" ranges, then a slightly higher total cholesterol of up to 220 might be acceptable. Please note that cholesterol levels below 180 present increased risk of hemorrhagic stroke and other diseases, so it is important that people maintain a minimal amount of cholesterol, i.e. 180 milligrams per deciliter of blood. It is important to note that in the past, cholesterol levels well above 200 were considered within the "normal" reference range.

Note: For those with existing cardiovascular disease, the Troponin I blood test is highly recommended. Optimal levels are under 0.4 ng/mL, intermediate levels are between 0.5 and 1.9 ng/ml and dangerously high levels are considered over 2.0 ng/ml. Based on an extrapolation of the most recent New England Journal of Medicine study³⁵, cardiac patients with troponin I levels over 0.4 ng/mL should ask their cardiologists to consider antiplatelet or antithrombotic therapy. In The New England Journal of Medicine study, those with troponin T levels in the intermediate range were seven times more likely to die over a 37-month period, while cardiac patients with troponin T levels above the intermediate range were almost 13 times as likely to die over a 37-month period.

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