Cholesterol Isn't the Problem in Heart Disease: Inflammation Is

Analysis by Dr. Joseph Mercola | February 03, 2024

STORY AT-A-GLANCE

> Long vilified as the chief trigger for heart disease, cholesterol is actually an essential component in nearly every cell in your body and has a protective effect in your respiratory and gastrointestinal systems

> Research has again underscored the importance inflammation plays in the development of chronic diseases, including heart disease, atherosclerosis and coronary artery disease

> Using drugs to reduce cholesterol levels or inflammation may increase your risk of fatal side effects; natural remedies that are not associated with dangerous health problems include magnesium, balancing essential fats and reducing hyperinsulinemia

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Cholesterol is a waxy substance found in nearly every cell of your body and is essential to good health. Your body uses it to make hormones, protect your cell membranes, digest food and manufacture vitamin D after exposure to the sun. Your liver manufactures most of the cholesterol your body requires from nutrients extracted from your food.

Animals use cholesterol in much the same way. This means the meats from beef, pork or chicken have similar levels of cholesterol. Even fat cells in animal meat have the same amount of cholesterol as other cells. All meat averages 25 milligrams of

cholesterol per ounce.[1] Dietary cholesterol is absorbed at different rates, between 20% and 60%, depending upon the individual.[2]

The 2015-2020 Dietary Guidelines for Americans[3] addressed past vilification of dietary cholesterol, announcing[4] "cholesterol is not considered a nutrient of concern for overconsumption."

These same guidelines also advise limiting sugar to no more than 10% of your diet,[5] which is approximately 50 grams of sugar, or 200 calories, in a diet consuming 2,000 calories each day. This level is still far higher than what is healthy as net carbohydrates are a prime factor in the development of inflammation.

Published research from a clinical trial sponsored by Novartis Pharmaceuticals demonstrates a reduction in recurring heart attacks, strokes and cardiovascular deaths in participants who took a targeted anti-inflammatory medication that did not lower cholesterol levels.[6]

Although the results of the study were encouraging as they scientifically demonstrate the association between inflammation and cardiac disease, I do not recommend using a pharmaceutical intervention to achieve what lifestyle choices can easily accomplish.

Lowering Inflammation Helps Lower Cardiac Risk

This study from Brigham and Women's Hospital was the culmination of a nearly 25-year cardiovascular research work. The trial was designed to test if reducing the amount of inflammation in the body would also reduce the risk of a recurrent heart attack or stroke. The researchers enrolled 10,000 people who had previously had a heart attack and had persistently elevated levels of C-reactive proteins, a strong biomarker of inflammation.

The participants were split into four groups, all of which received aggressive standard health care. Three groups were administered the drug canakinumab at various levels and the fourth placebo group received no drug. The drug, in 2017 priced at $200,000 a year by Novartis Pharmaceuticals, demonstrated an ability to reduce inflammation with

a reduced risk of cardiac events and reduced the need for interventional procedures, such as bypass surgery or angioplasty.[7]

The hypothesis of whether an intervention that reduces inflammation could potentially reduce your risk of a recurrent heart attack was tested using a medication already approved for use to target the immune system without affecting your lipid level.[8] While the drug demonstrated a reduced risk in some patients, one of the side effects was a higher risk of fatal infection.

Once the researchers identified the results as they related to cardiac health, they also did an investigative analysis and found participants taking the medication had a reduced risk of lung cancer rates and deaths.[9]

The lead researcher in this study is also involved in another evaluating the effectiveness of low dose methotrexate — an inexpensive common cancer and rheumatoid arthritis drug — in cardiovascular disease. These results are due to be completed in two to three years.[10]

Though there may be positive effects using methotrexate, it must be noted this drug also comes with a laundry list of side effects, including intestinal bleeding, sepsis, reduced blood platelets and liver damage.[11] The idea that inflammation is important in the development of disease and in the importance of cardiac health is not new, but it has now found an avenue for exploration in the pharmaceutical industry.

Inflammation Linked to Cardiac Disease, Cancer and Other Health Conditions

Studies such as these confirm the hypothesis that inflammation is one of the major underlying factors behind cardiac disease, cancer, diabetes and many other conditions. Chronic pain, peripheral neuropathy and migraines are also rooted in the inflammatory process in your body.

Unfortunately, while many are suffering from these types of conditions, understanding how to eliminate the inflammation is not generally understood. Many physicians simply turn to pharmaceuticals that carry a significant number of side effects.

The source of inflammation in your body is usually driven by your lifestyle choices, especially those that affect your intestinal tract. Interestingly, the surface of your gut may cover two tennis courts when laid out flat.

This is an amazing amount of surface area that resides in your abdomen and is responsible for protecting your health. The degree of permeability, or how much your intestines will allow through breaks in the cell wall, is dependent on a variety of factors, including the food you eat and the stress you're under.

This disruption in the interconnections between the cells in your intestines may result in small holes that allow food particles and bacteria to enter your blood stream and trigger an immune response, also called leaky gut syndrome. This is a serious problem that triggers inflammation in your body and increases your potential risk for illness. With repeated damage to the microvilli of your intestinal walls, they begin to lose the ability to do their job.

This impairs your ability to digest food properly or absorb nutrients. One of the food groups that factor into the development of leaky guy syndrome is grains. Although advertising often touts the health benefits of eating whole grains, a growing body of scientific evidence demonstrates that whole grains, lectins and legumes are responsible for the development of leaky gut syndrome and the resulting inflammation.

Drugs Are Not the Answer

In many cases your physician has an insufficient understanding of the dangers of using pharmaceutical interventions to treat inflammation and disease. They often prescribe a quick pill, possibly believing patients may be more willing to take a pill than to change their eating habits or lifestyle choices. Unfortunately, each of those prescriptions come

with side effects, some of which are more dangerous than the original condition they were intended to treat.

This was amply demonstrated in the featured study where one of the side effects from the medication tested was a higher risk of death due to infection.

Side effects from other **anti-inflammatory medications** have resulted in the medication being pulled from use, such as Vioxx, taken off the market after it was found the drug increased the risk of heart attack and stroke. Statins are another medication prescribed with the mistaken idea that reducing your cholesterol levels will reduce your risk of heart attack and stroke.[12]

Dr. Dwight Lundell, former chief of staff and chief of surgery at Banner Heart Hospital in Arizona, took a stand against statin medications, believing they were doing cardiology patients more harm than good.[13]

This goes against years of physicians prescribing medications to lower cholesterol and strongly recommending diets that severely restrict any fat intake. Practicing physicians have been bombarded with pharmaceutically sponsored literature and seminars insisting heart disease is the result of one factor — elevated cholesterol levels.

This has led to large numbers of individuals experiencing the side effects of statins, as these drugs reduce your ability to absorb CoQ10, necessary for energy production in every cell in your body. The drug also reduces your ability to absorb vitamin K2, stimulating atherosclerosis and heart failure.[14] Studies have also linked the use of statin drugs to cancer,[15,16] diabetes,[17] neurodegenerative disease,[18] musculoskeletal disorders[19] and cataracts.[20]

Statins not only have dangerous side effects, but they are not effective against preventing heart disease. You may assume falling cholesterol levels are proof you're getting healthier, but you would be wrong.

Cholesterol Is Not the Enemy

The Minnesota Coronary Experiment was a study performed between 1968 and 1973 that examined the relationship between diet and heart health.[21] The researchers used a double-blind randomized trial to evaluate the effect of vegetable oil versus saturated fats in coronary heart disease and death.

The results were left unpublished until 2016, when they appeared in the BMJ. An analysis of the collected data revealed lowering your cholesterol levels through dietary intervention did not reduce your risk of death from coronary heart disease. The researchers concluded:[22]

> *"Available evidence from randomized controlled trials shows that replacement of saturated fat in the diet with linoleic acid effectively lowers serum cholesterol but does not support the hypothesis that this translates to a lower risk of death from coronary heart disease or all causes.*
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> *Findings from the Minnesota Coronary Experiment add to growing evidence that incomplete publication has contributed to overestimation of the benefits of replacing saturated fat with vegetable oils rich in linoleic acid."*

The researchers found that for every 30-point drop in total cholesterol, there was a 22% increase in the risk of death from cardiac disease. On autopsy, the group eating vegetable oil and the group eating saturated fat had the same amount of atherosclerotic plaques in their arteries, but the group eating saturated fat experienced nearly half the number of heart attacks as the group eating vegetable oil.

After scientists recommended Americans stop eating meat, eggs and saturated fats, intake of sugar and other carbohydrates spiked. In response, the obesity rate in the country exploded, as did the number of people who suffer from diabetes, cardiovascular disease and stroke. Over 50 years of research point to another culprit in the advancement of disease, and it isn't cholesterol.

Instead, cholesterol is a response mechanism activated by your body when a blood vessel is injured through an inflammatory process.[23] Once the lesion occurs, your body

sends cholesterol to cover the area and prevent further damage, much like a scab after you cut your skin.

Beverly Teter, lipid biochemist at the University of Maryland, has spent years studying how different types of fat in your food affects your long-term health. Over the years she has found that people with higher levels of cholesterol live longer. She has a personal story that bears witness to this belief:[24]

> *"I come from a family that has, my mother's side, had naturally high cholesterol. Her cholesterol was between 380 and 420 when I started watching her medical records, and she died at 97. So I don't think that cholesterol was too bad for her."*

It is the inflammatory process in your body that first triggers an injury to your arterial walls. No matter how low your cholesterol numbers go, your body will still use the cholesterol it has to repair the arterial wall. On the other hand, cholesterol plays other protective roles against respiratory and gastrointestinal problems and in the production of vitamin D.

However, without inflammation, your arterial walls do not become injured and there are no atherosclerotic plaques laid down that may eventually block the artery. Statins work to lower your total cholesterol number, but cannot stop the injuries to your arteries from inflammation. So, this artificial reduction in total cholesterol has little to do with your overall risk of cardiac disease.

Better Assessment of Heart Disease Risk Found in Evaluating Other Tests and Cholesterol Ratios

As you evaluate your risk of cardiovascular disease, there are specific ratios and blood level values that will tell you much more than your total cholesterol number. The size of your low-density lipoprotein (LDL) cholesterol, for example, is more important than your overall total LDL level. Large particle LDLs are not harmful to your health while the smaller, denser LDL particles may create problems as they squeeze through the lining of your arteries, oxidize and trigger inflammation.

An NMR LipoProfile that measures the size of your LDL particles is a better assessment of your risk of heart disease than total cholesterol or total LDL. The following tests will also give you a better assessment of your potential risk for heart attack or coronary artery disease:

- **HS-CRP —** High sensitivity C Reactive Protein is one of the best overall measures of inflammation. Since we now understand that inflammation, not cholesterol, is the primary cause of heart disease, this would be an excellent screening test. The lower the number the better. Ideally your level should be below 0.7. Mine typically ranges from <0.2 to 0.3.

- **Cholesterol ratios —** Your HDL/cholesterol ratio and triglyceride/HDL ratio is a strong indicator of your risk. For your HDL/cholesterol ratio divide your HDL by your total cholesterol and multiply by 100. That percentage should ideally be above 24%. For your triglyceride/HDL ratio divide your triglyceride total by your HDL. The ideal percentage is below 2%.

- **Fasting insulin level —** Sugar and carbohydrates increase inflammation. Once eaten, these chemicals trigger a release of insulin, promoting the accumulation of fat and creation of triglycerides, making it more difficult for you to lose weight or maintain your normal weight. Excess fat around your midsection is one of the major contributors to heart disease.[25]

  Your fasting insulin level can be determined by a simple, inexpensive blood test. A normal fasting blood insulin level is below 5 microunits per milliliter (mcU/ml), but ideally, you'll want it below 3 mcU/ml. If your insulin level is higher than 3 to 5, the most effective way to optimize it is to reduce net carbs.

- **Fasting blood sugar level —** Studies have demonstrated people with higher fasting blood sugar levels have a higher risk of having coronary heart disease.[26] In fact, when your fasting blood sugar is between 100 and 125 mg/dl, your risk of coronary artery disease increases to 300% more than those whose level is below 79 mg/dl.

- **Iron level** — Iron creates an environment for oxidative stress, so excess iron may increase your inflammation and increase your risk of heart disease. An ideal iron level for adult men and non-menstruating women is between 40 and 60 nanograms per milliliter (ng/ml). You do not want to be below 20 ng/ml or above 80 ng/ml.

Magnesium Plays Substantial Role in Reducing Inflammation

Magnesium is vital for your optimal health, biological function and mitochondrial health. There are more than 3,750 magnesium-binding sites on human proteins and more than 500 enzymes in your body rely on magnesium to function properly. Low levels of magnesium are associated with migraines, anxiety, depression, fibromyalgia, cardiovascular disease and death from all causes.

Low levels of magnesium are a culprit in the development of inflammation and may play a role in hardening of your arteries as they inhibit the deposit of lipids on your arterials walls and plaque formation.[27]

Use of the mineral also has significantly positive effects when administered intravenously (IV) as soon as possible after a heart attack.[28] In a double-blind, placebo-controlled trial, IV magnesium or normal saline was administered to 2,000 patients within 24 hours of their heart attack.

Those who received the magnesium experienced 24% fewer deaths and within the following five years, the death rate was also 21% lower than those not treated with magnesium. IV magnesium has been used to treat patients with congestive heart failure and arrhythmias.[29] Low levels have been found to be an important predictor of sudden cardiac death[30] and IV magnesium has been used to treat the onset of atrial fibrillation.[31]

The use of magnesium during an immediate cardiac event demonstrates the significant health benefits of the mineral. However, ensuring an adequate level of magnesium on a daily basis may help to prevent these cardiac events as the mineral is also closely associated with reducing the inflammatory response.

A study in the European Journal of Clinical Nutrition[32] determined there was an inverse relationship between levels of magnesium in the body of participants and the level of c-reactive proteins. The researchers concluded the beneficial effect of magnesium intake on chronic diseases could potentially be explained by the effect the mineral has on inhibiting inflammation.[33]

Many researchers and physicians believe more recent studies demonstrate chronic low-grade inflammation is linked to heart attacks, strokes, Alzheimer's disease, cancer and Type 2 diabetes.[34] Following the release of another study demonstrating the role inflammation plays in chronic disease,[35] Dr. Carolyn Dean, magnesium expert and author of "The Magnesium Miracle," stated:[36]

> *"Cholesterol is not the cause of heart disease and the decades-long attempt to treat this condition with statin drugs has failed, because the true cause is inflammation."*

Dean went on to comment on another study that demonstrated magnesium deficiency contributes to an exaggerated response to oxidative stress and inflammation, saying:[37]

> *"This study shows that at the cellular level, magnesium reduces inflammation. In the animal model used, magnesium deficiency is created when an inflammatory condition is produced. Increasing magnesium intake decreases the inflammation.*
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> *With magnesium being actively required by 600 to 700 enzyme systems in the human body, internal functions that reduce inflammation with the help of magnesium are being newly discovered every year. For example, magnesium has been found to be a natural calcium channel blocker, which is crucial because calcium in excess is one of the most pro-inflammatory substances in the body."*

Natural Methods to Reduce Inflammation

There are multiple factors that affect the inflammatory process in your body. Some of the more significant include:

- **Hyperinsulinemia** — An excess of insulin in your blood triggered by a diet high in net carbohydrates increases your level of inflammation. What you eat tends to be the deal-breaker in how much insulin your body secretes. However, there are other factors that contribute to your insulin levels, such as smoking, sleep quality and level of vitamin D.

- **Unbalanced fatty acids** — Your body needs a balance of omega-3 and omega-6 fats. Unfortunately, most diets have an overabundance of omega-6 fats leading to greater amounts of inflammation. Strive for a 1-to-1 ratio of omega-3 to omega-6 fats to reduce inflammation and your risk of heart disease.

- **High iron stores** — Ensure your ferritin blood levels are below 80 ng/ml. If they are elevated this can increase your level of inflammation. The simplest and most efficient way to lower your iron level if elevated is to donate blood. If you can't donate, then therapeutic phlebotomy will effectively eliminate the excess iron. Heavy metal detoxification will also naturally reduce high iron.

- **Leaky gut** — Food particles and bacteria leaking from your intestines increase your level of inflammation and your risk of heart disease. By eliminating grains, sugars and lectin-rich legumes, while adding fermented foods, you may heal your gut and reduce your level of inflammation.

- **Inadequate levels of magnesium** — A century ago your diet provided nearly 500 mg of magnesium per day. Today, courtesy of nutrient-depleted soil you may be getting only 150 mg per day. Dean suggests using your intestinal reaction as a marker for your ideal dose of supplementation.

  Your body flushes excess magnesium through your stool, so you may determine your own individual needs using magnesium citrate. Start by taking 200 mg of oral magnesium citrate each day, gradually increasing this dose until you develop slightly loose stools.

I now believe many may benefit from as much as 1 to 2 grams of magnesium per day, although you'd need to gradually work your way up to that amount and pay attention to your body's response, especially if you use magnesium citrate, which causes loose stools.

My personal preference for magnesium supplementation is magnesium threonate as it appears to more efficiently penetrate cell membranes, including your mitochondria. It penetrates your blood-brain barrier and may help improve memory and it may be a good alternative to reduce migraine headaches.

Sources and References

- [1] Berkeley Wellness, September 1, 2011 (Archived)
- [2] Eating Well, How much does eating cholesterol in my food really affect my blood cholesterol? (Archived)
- [3, 5] CNN, January 7, 2016
- [4] Dietary Guidelines Advisory Committee, Food, Nutrient Intakes and Health
- [6, 7, 10] Health Canal, August 27, 2017 (Archived)
- [8, 9] Forbes, August 27, 2017
- [11] NIH. Methotrexate. LiverTox. February 19, 2020
- [12] NHS U.K. Side Effects Statins
- [13, 27] Dr. Sircus, July 17, 2015
- [14] Expert Review of Clinical Pharmacology, 2015;8(2):189
- [15] Cancer, Epidemiology Biomarkers and Prevention, 2013;22(9):1529
- [16] Prostate, 2011;71(16):1818
- [17] The Lancet, 2010;375(9716):735
- [18] Movement Disorders, 2015;30(4):552
- [19] Journal of the American Medical Association, 2013; 173(14):1318
- [20] Open Journal of Endocrine and Metabolic Diseases, 2013;3(3):179
- [21, 22] The BMJ, 2016; 353: i1246
- [23, 24] CBN, February 10, 2013 (Archived)
- [25] Critical Pathways in Cardiology, 2007;6(2):51
- [26] The American Journal of Cardiology, 2002;89(5):596
- [28] Whittaker Wellness Institute, Magnesium for Heart Disease
- [29] American Heart Journal, 1993;125(6):1645
- [30] American Heart Journal, 2010;160(3):464
- [31] Heart, 2007;93(11):1433
- [32, 33] European Journal of Clinical Nutrition, 2014;68: 510
- [34, 36, 37] PR Newswire, October 29, 2013

- [35] Archives of Biochemistry and Biophysics, 2007;458(1):48