

Cholesterol: Friend or Foe?

Neelanjana Singh*

Quite like the stereotypical Hindi movie villain, cholesterol has long had a bad reputation. However, in the light of recent evidence, it's time to review our opinion on cholesterol.

Cholesterol, a dreadful word for many, is actually a necessity for the body to function optimally. Cholesterol is a waxy substance manufactured by the liver that is required by every cell of our body, where it plays a nuanced role. Because cholesterol is a lipid-like substance, it does not dissolve into the body fluids, hence it is carried around the body in the form of lipoproteins (cholesterol combined with protein packets).

If cholesterol is needed by our body, then why do we fear it?

The fear is related to the hardening and narrowing of the blood vessels due to cholesterol deposits, which is referred to as atherosclerosis. These cholesterol deposits are mainly of LDL-C (Low Density Lipoprotein Cholesterol), often referred to as the 'bad' cholesterol.

But when we look at the problem closely, we learn that it's not just the process of deposition of cholesterol that in isolation increases the risk of heart disease. This deposition of LDL-C is essentially a benign process. It's when the deposited cholesterol lining the arteries is oxidized that it sets off a chain of reactions that can have serious health implications. A diet rich with antioxidants and anti-inflammatory properties (found in veggies & fruits) plays an important role in preventing oxidation.

Understanding Inflammation

Inflammation in the body occurs because of any of the following reasons, or a combination of the following reasons. Lack of physical exercise, infections of different kinds (including hidden ones like gum disease), chronic stress, and food allergies can be some causes for inflammation in the body. Of these factors, a diet that is high on sugar, saturated fats and trans fats, tops the list.

The commonly used marker to measure inflammation in the body is C-reactive protein (CRP) levels in the blood. Higher values of CRP can increase the risk of heart disease. A recent Harvard study indicates that inflammation is a bigger risk factor for heart disease than high cholesterol. Normal levels of cholesterol did not seem to

* Nutrition Therapist and Wellness Consultant

provide any protection against heart disease when CRP was high. The biggest risk was when both these markers—CRP and cholesterol—were high.

A diet to keep inflammation at bay is typically the Mediterranean Diet that has plenty of fruits and vegetables. The fats in the diet are of the monounsaturated variety and they help decrease the harmful LDL cholesterol, reduce harmful oxidation, and increase the good cholesterol, which is HDL-C (the type of cholesterol taken back to the liver from different parts of the body to be broken down there).

Diet and Cholesterol

Recent studies have established that dietary cholesterol accounts for only 25% of the circulating cholesterol that is measured in blood, which is why today we realize the need for a holistic view of our diet rather than follow an overly restrictive diet.

This is not to say that high cholesterol levels should be left unattended. Lifestyle modification is the first line of treatment that is recommended for cholesterol management.

A low fat diet has often been advocated whenever cholesterol levels are found to be high. But this advice does not hold good any longer. There is growing evidence to suggest that sugars, including fructose and high fructose corn syrup that you find on the labels of several food products, are the real villains. What is interesting to note is that when low fat diets were prescribed, they tended to be high on sugars. When sugary, refined and processed foods were consumed, the cholesterol-producing mechanism in the liver was activated by insulin.

Eggs and Cholesterol

Eggs have in the past been looked upon as cholesterol bombs. One large egg contains approximately 200 mg of cholesterol in it, most of it confined to the yolk. The high cholesterol content in eggs led us to believe that eggs should be shunned if blood cholesterol is high. Interestingly, the advice was to shun eggs but not ice-cream!

Thanks to recent knowledge, this recommendation has been overturned and there is good news for egg lovers. This also serves as a reminder that we shouldn't examine a food with respect to a single nutrient, but look at it more holistically as a package of nutrients. In this case, egg as a food item has many beneficial nutrients as a package: proteins, vitamins, minerals and the good fats.

In fact, when dietary cholesterol is high, the liver turns down its production to maintain levels. It is therefore not surprising that the US Dietary Guideline in 2015 and then again in 2020 removed the limit of dietary cholesterol, which was earlier at 300mg per day. However, practicing moderation is still recommended.

Other high cholesterol foods: What is their standing?

Now that eggs have been redeemed, does this mean that we have a free pass to eat the other high cholesterol foods? It is critical to remember that many of the cholesterol-rich foods are also high on saturated fats.

Saturated fats are known to increase the risk of heart disease, hence one has to restrict the intake of high saturated fat foods like red meats, shellfish, and full-fat dairy in accordance with the permitted daily limit. Individuals above the age of two years should limit saturated fat intake to <10% of the total calories consumed per day. It is advisable to replace saturated fat with polyunsaturated fats such as oils of mustard, canola, olive, and nut butters.

What can one do if diagnosed with high cholesterol levels?

For one, quit smoking. This certainly helps in improving HDL levels. Just one year after quitting, it reduces the risk of heart disease by half. As far as diet is concerned, the following four elements are powerful aids:

- Soy Proteins
- Tree Nuts
- Soluble Fibre
- Plant Sterols

A whole food diet composed of the aforementioned elements can help lower cholesterol by a whopping 30%, very similar to what drugs (statins) can achieve. This type of diet goes by the name of Portfolio Diet. In concept, it is quite a straightforward diet. It requires the substitution of meats and dairy with soy protein rich foods like tofu, tempeh, soy milk, etc., such that 35 g of soy protein is consumed. In addition to this, a handful of nuts (25 g) such as almonds or walnuts needs to be incorporated into the everyday menu. A good amount of soluble fibre (18 g) can come from oats, legumes, fruits, vegetables, psyllium husk. The 2 g plant sterol comes from a variety of plant foods- fruits and vegetables, legumes and some sterol-supplemented foods like oils and margarine. Sterols are plant versions of cholesterol. When plant sterols are absorbed from the diet, they compete with the cholesterol circulating in our blood and help in reducing its levels.

All in all, the proof of concept is strongly in favour of the Portfolio Diet but it may be a tough diet to sustain for the meat and processed food lovers. In such cases, the Mediterranean Diet is recommended. The Mediterranean Diet is far more versatile and adaptable.

Which are the foods that need to be reduced or eliminated when cholesterol levels are high?

Although the Portfolio Diet does not require you to eliminate any food, there are some restrictions that are beneficial to reducing the risk of heart disease.

- **Processed meats.**
- **Carbohydrates that are excessively refined, such as white bread, white polished rice and pasta.**
- **Sugar and sugary items including cookies, candies, and beverages like energy drinks, packaged iced tea and sodas.**
- **Trans fats and saturated fats for cooking, and the foods that are high on saturated fat.**

Do supplements work?

Psyllium husk, about 10 g daily taken as a supplement, which provides 7 g of soluble fiber, can help reduce the risk of Coronary Artery Disease.

Extra Coenzyme Q10 in the form of a supplement can have a cholesterol lowering impact, but its role in reducing the risk of heart disease is not yet clear.

Research on Fish Oil supplements seems to suggest that when older adults with high blood pressure and high cholesterol take them, it helps with total and LDL cholesterol. For the other age groups, the results are relatively unclear.

What's key?

If your cholesterol is out of balance, lifestyle interventions are the first line of treatment. With respect to diet, it's the overall quality of the diet that matters—and not just the avoidance of cholesterol-rich foods or following a low fat diet. Instead of obsessing over specific food items, it helps to focus on the overall diet quality.

Besides diet, other factors that help in cholesterol management are getting the right amount of sleep, exercising regularly, and managing stress levels effectively. Smoking and heavy alcohol intake continue to be on the list of harmful practices.

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