Little known type of cholesterol may pose the greatest heart disease risk

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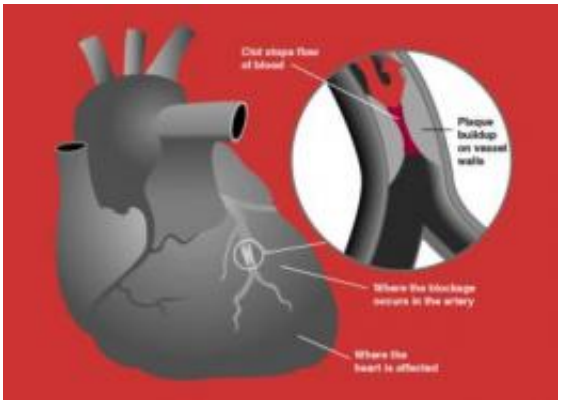

A little known type of cholesterol, oxycholesterol, may pose the greatest heart disease risk, researchers say. Shown is a diagram of a heart attack. Credit: Wikimedia Commons

Health-conscious people know that high levels of total cholesterol and LDL cholesterol (the so-called "bad" cholesterol) can increase the risk of heart attacks. Now scientists are reporting that another form of cholesterol called oxycholesterol — virtually unknown to the public — may be the most serious cardiovascular health threat of all.

Scientists from China presented one of the first studies on the cholesterol-boosting effects of oxycholesterol here today at the 238th National Meeting of the American Chemical Society. The researchers hope their findings raise public awareness about oxycholesterol,

including foods with the highest levels of the substance and other foods that can combat oxycholesterol's effects.

"Total cholesterol, low-density lipoprotein cholesterol (LDL), and the heart-healthy high-density lipoprotein cholesterol (HDL) are still important health issues," says study leader Zhen-Yu Chen, Ph.D., of Chinese University of Hong Kong. "But the public should recognize that oxycholesterol is also important and cannot be ignored. Our work demonstrated that oxycholesterol boosts total cholesterol levels and promotes atherosclerosis ["hardening of the arteries"] more than non-oxidized cholesterol."

Fried and processed food, particularly fast-food, contains high amounts of oxycholesterol. Avoiding these foods and eating a diet that is rich in antioxidants, such as fresh fruits and vegetables, may help reduce its levels in the body, the researchers note.

Scientists have known for years that a reaction between fats and oxygen, a process termed oxidation, produces oxycholesterol in the body. Oxidation occurs, for instance, when fat-containing foods are heated, as in frying chicken or grilling burgers or steaks. Food manufacturers produce oxycholesterol intentionally in the form of oxidized oils such as trans-fatty acids and partially-hydrogenated vegetable oils. When added to processed foods, those substances improve texture, taste and stability. Until now, however, much of the research focused on oxycholesterol's effects in damaging cells, DNA, and its biochemical effects in contributing to atherosclerosis. Chen believes this is one of the first studies on oxycholesterol's effects in raising blood cholesterol levels compared to non-oxidized cholesterol.

In the new study, Chen's group measured the effects of a diet high in oxycholesterol on hamsters, often used as surrogates for humans in such research. Blood cholesterol in hamsters fed oxycholesterol rose up to 22

percent more than hamsters eating non-oxidized cholesterol. The oxycholesterol group showed greater deposition of cholesterol in the lining of their arteries and a tendency to develop larger deposits of cholesterol. These fatty deposits, called atherosclerotic plaques, increase the risk for heart attack and stroke.

Most importantly, according to Chen, oxycholesterol had undesirable effects on "artery function." Oxycholesterol reduced the elasticity of arteries, impairing their ability to expand and carry more blood. That expansion can allow more blood to flow through arteries that are partially blocked by plaques, potentially reducing the risk that a clot will form and cause a heart attack or stroke.

But a healthy diet rich in antioxidants can counter these effects, Chen said, noting that these substances may block the oxidation process that forms oxycholesterol. Good sources of antioxidants include fruits, veggies, beans, and certain herbs and spices. Healthy alternatives to fast-food, which also boosts oxycholesterol, include whole grains, fresh fruits and vegetables, seeds, and nuts.

Scientists do not know whether the popular anti-cholesterol drugs called statins lower oxycholesterol, Chen said.

Source: American Chemical Society (news : web)