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Abnormal cholesterol levels may raise risk of heart failure

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(PhysOrg.com) -- Even if you never have a heart attack, abnormal blood cholesterol levels may significantly raise your risk of heart failure, according to research reported in *Circulation: Journal of the American Heart Association*.

Heart failure is a progressive condition in which the heart muscle becomes unable to pump enough blood to meet the body's needs for blood and oxygen. Heart attack is a major risk factor for heart failure. When areas of heart muscle are damaged during a heart attack, it can reduce pumping ability and set the stage for heart failure.

In previous studies using lipid-lowering drugs to reduce the risk of heart attack, risk of heart failure has also fallen. So the researchers wondered whether that is due only to fewer heart attacks, or whether abnormal lipids might pose their own unique risk through a different mechanism.

"We hypothesized that there might be a direct effect of lipids on the function of heart muscle," said Daniel Levy, M.D., senior author of the study and director of the National Heart, Lung, and Blood Institute's Framingham Heart Study. "For example, if lipids infiltrate the heart, like they do the liver, this might be one reason that people with diabetes are predisposed to heart failure."

Levy and his colleagues analyzed the relationship between lipid levels and heart failure in 6,860 participants (average age 44, 54 percent women) in the Framingham Heart Study. None had coronary heart

disease at the beginning of the study. After an average 26 years of follow-up, 680 participants (49 percent women) developed heart failure.

Based on lipid levels when the study began, the incidence of heart failure was:

• 12.8 percent in those with low levels of high-density lipoprotein (HDL), the "good" cholesterol. Low HDL is less than 40 milligrams per deciliter (mg/dL) in men and less than 50 mg/dL in women.
• 6.1 percent in those with desirable HDL levels (at least 55 mg/dL in men and 65 mg/dL in women).
• 13.8 percent in those with high levels (at least 190mg/dL) of non-HDL cholesterol (which includes low-density lipoprotein - the "bad" cholesterol - and triglycerides).
• 7.9 percent in those with desirable levels of non-HDL cholesterol (less than 160mg/dL).
• In a model that adjusted for age, sex, body mass index, blood pressure, diabetes and smoking, the risk of heart failure was:
• 29 percent greater in those with high non-HDL cholesterol compared with those who had desirable lower levels.
• 40 percent less in those with desirable high HDL-cholesterol compared with those who had lower levels.

"The biggest surprise was the strength of the inverse relation of HDL to risk of heart failure," Levy said.

When the model was further adjusted for the occurrence of a heart attack during the study, the relation of cholesterol to heart failure was slightly weakened but remained significant — 13 percent greater in those with high non-HDL cholesterol and 25 percent lower in those with high HDL.

"This study goes a step further in implicating cholesterol levels (both

HDL and non-HDL) in heart failure and suggests that cholesterol-altering therapy may have long-term benefits in preventing heart failure above and beyond its effects on preventing myocardial infarction," Levy said.

The study was not a randomized clinical trial, so the results should not be used to alter physician guidelines about the appropriate use of lipid-altering drugs, Levy said. It might be possible to look back at data from clinical trials of cholesterol lowering medications, eliminate people who had heart attacks from the analysis and determine whether heart failure cases were lower in other people taking the drugs, he said.

Besides medications, physical activity, smoking cessation, a diet emphasizing monounsaturated fats such as olive oil, and modest alcohol consumption can raise levels of "good" HDL cholesterol.

Other risk factors for heart failure include high blood pressure, abnormalities of heart muscle or valves, smoking, obesity, and diabetes.

Provided by American Heart Association (news : web)