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Does cholesterol drive atherosclerosis?

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One of the most enduring views held by mainstream medicine is the close association between circulating cholesterol and cardiovascular disease and in particular coronary heart disease. Except under rare circumstances, a prerequisite precursor to acute coronary or cardiovascular events of an ischemic nature is atherosclerosis, which is known to start in some individuals at an early age and the prevalence is strongly age dependent. It is widely believed that cholesterol drives atherosclerosis, a notion that can be found in the introductions of hundreds of papers. The advent of non-invasive coronary artery imaging techniques such as electron beam computed tomography and coronary computed tomographic angiography have allowed medical scientists to inadvertently test this hypothesis by direct observation of the prevalence and progression of calcified, mixed and non-calcified coronary plaque. The results of a large number of studies involving a broad spectrum of age, ethnic background and both genders fail to support this hypothesis and in fact find a total lack of correlation between circulating total or LDL cholesterol and coronary plaque burden and progression in individuals with subclinical atherosclerosis, including type 2 diabetics who have well documented elevated risk of acute cardiovascular events. Furthermore, a number of studies have consistently found that lipid lowering, especially with the statin class of drug, fails to impact either the prevalence or progression of subclinical coronary atherosclerosis in either non-diabetics or diabetics. This apparent falsification of the hypothesis that cholesterol drives coronary atherosclerosis continues to be ignored. Furthermore, in true primary prevention trials using statin therapy to prevent acute coronary events in both non-diabetic and diabetic individuals, almost all generate absolute risk reductions that are very small, some would say not clinically significant, and there is no impact on mortality. The belief that this approach represents significant preventive therapy, especially for those who are asymptomatic but judged of high risk, including diabetics, is based on relative risk reductions which have the well recognized and intrinsic potential for exaggerating benefit and misleading clinical practice. Large numbers needed to treat to prevent one acute event suggests the need for a new paradigm.

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