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Genetic variants of USF1 are associated with the increased risk for cardiovascular disease

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Cardiovascular diseases (CVD) are major contributors to morbidity and mortality worldwide. Several interacting environmental, biochemical, and genetic risk factors can increase disease susceptibility. While some of the genes involved in the etiology of CVD are known, many are yet to be discovered. During the last few decades, scientists have searched for these genes with genome-wide linkage and association methods, and with more targeted candidate gene studies.

Master of Science, Kati Kristiansson, from the research group of Professor Leena Peltonen at the National Public Health Institute and the University of Helsinki, Finland, has investigated variation within the upstream transcription factor 1 (USF1) gene locus in relation to CVD risk factors, atherosclerosis, and incidence and prevalence of CVD.

USF1 gene was first identified in Finnish families ascertained for familial combined hyperlipidemia, a common dyslipidemia predisposing to coronary heart disease. The gene encodes a ubiquitously expressed transcription factor regulating expression of several genes from lipid and glucose metabolism, inflammation, and endothelial function.

“We examined association between USF1 variants and several CVD risk factors, such as lipid phenotypes, body composition measures, and metabolic syndrome, in two prospective population cohorts, and our data suggested that USF1 contributes to these CVD risk factors at the population level”, Kristiansson says. Notably, the associations with quantitative measurements were mostly detected among study subjects

with CVD or metabolic syndrome, suggesting complex interactions between USF1 effects and the pathophysiological state of an individual.

To address the question if carriership of this risk allele has a direct impact on the atherosclerotic lesions of the coronary arteries and abdominal aorta, Kristansson used two study samples of middle-aged men with detailed measurements of atherosclerosis obtained in autopsy. It turned out that USF1 variation significantly associated with the size of the areas of several types of arterial wall lesions, especially with calcification of the arteries.

Source: University of Helsinki