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Lipids in Coronary Kidney Disease: From Epidemiology to Therapeutics

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Dyslipidemia is a major contributor to the large burden of atherosclerotic cardiovascular disease in the CKD population. One of the most important pathophysiological mechanisms for CVD in patients with CKD is the widespread and possibly accelerated formation of atherosclerotic plaques due to hyperlipidemia, uremic toxins, inflammation, oxidative stress, and endothelial dysfunction. The most important alteration on lipid profile in CKD may be the changes in composition of LDL cholesterol even LDL cholesterol level could be normal. SdLDL cholesterol or oxidized LDL cholesterol levels increase in CKD due to LRP deficiency, and oxidized LDL cholesterol raises the atherosclerosis risk. However, there is a paradoxical relationship between cholesterol levels and mortality in CKD patients. This shows the predominant effect of oxidative stress and inflammation on mortality in CKD patients..Recent studies showed that the level of oxidized LDL cholesterol increases, and that high-density lipoprotein (HDL) cholesterol dysfunction occurs as kidney function declines and inflammation becomes more prevalent. HDL cholesterol, which is responsible for reverse cholesterol transport, plays an important role to decrease the risk of foamy cells and slows the formation of atherosclerotic plaques in arterial intimal walls. HDL cholesterol deficiency and dysfunction increase monocyte count that can form foamy cells. Also, HDL cholesterol dysfunction also causes pro-inflammatory effects and has a role in progression of CKD. In recent studies, lipidomics has increased the focus on the search for identifying target biomarkers for the early detection of renal dysfunction; however, further research is needed to find more reliable. results. Lipidomics could be the new renal biomarker in the near future after more detailed analyses are done. Since dyslipidemia and oxidative stress can also progress renal dysfunction and increase the risk of cardiovascular complications, they can be treated with anti-lipidemics and antioxidant drugs. Statins and vitamin E are the drug choices that could be effective to both reduce complications and slow the disease progression. Therefore, CKD, oxidative stress, and inflammation have a direct relation with dyslipidemia and the formation of atherosclerosis, and markers of those entities can be used for diagnostic and prognostic purposes.