

### The ongoing trials in the management of vascular calcification

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Vascular calcification is frequently encountered in patients with chronic kidney disease (CKD). Given that a greater degree of vascular calcification is associated with a higher prevalence of cardiovascular disease especially in CKD population, attenuation of vascular calcification has been tried to reduce cardiovascular morbidity and mortality in CKD patients. The development of vascular calcification is considered as a result from an imbalance between inducers and inhibitors of the calcification process, and experimental and clinical trials have focused on modifying the expression of both inducers and inhibitors. One of well-known inhibitors of vascular calcification is matrix Gla protein (MGP), which is produced by vascular smooth muscle cells and requires vitamin K-dependent post translational modification to be finally active. Based on the reports that vitamin K deficiency is commonly observed in CKD and dialysis patients and adequate vitamin K intake was associated with all-cause and cardiovascular mortality, vitamin K replacement has been tried as a way of reducing vascular calcification with a decrease of dephosphorylated-uncarboxylated MGP. The VitaVasK study is a randomized, prospective, multicenter, open-label interventional clinical trial, which supplies vitamin K1 orally (phylloquinone, oily liquid type) in hemodialysis patients. In that study, vitamin K1 supplementation was maintained for 18 months, and has been followed-up for coronary and aortic calcification, and major adverse cardiovascular events and all-cause mortality for five years thereafter. High vitamin K2 (menaquinone) intake has also been known to decrease coronary calcification and coronary heart disease in general population. It has been trying to check the efficacy of vitamin K2 supplementation on coronary artery calcification of CKD patients (VitaK-CAC trial). Various clinical attempts to reduce vascular calcification with modulating the expression of emerging mediators in vascular calcification such as klotho/FGF-23 or microRNAs have been tried as experimental studies.

#### Reference

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