Accumulating evidences have indicated that chronic kidney disease (CKD) is associated with increased risk of cardiovascular disease and death. Patients with CKD are frequently associated with the presence of atherosclerotic diseases. The underlying diseases of patients with CKD, e.g., hypertension, diabetes, and dyslipidemia, may affect arteriosclerosis and atherosclerosis and reduce kidney function.

Recently, Sonoda et al. reported that the ankle–brachial index (ABI) can predict incident CKD. They observed that an ABI value of 0.90–0.99 in a general Japanese population without CKD was associated with an increased risk of incident CKD, independent of the traditional cardiovascular risk factors. Previous studies have also demonstrated that an ABI value of <0.90 predicted decline in kidney function in the general Western population. Further, autopsy studies have revealed that asymptomatic plaques in the common iliac arteries were associated with generalized atherosclerosis and renal failure. Additionally, Kasiske et al. suggested that internal vascular disease and glomerulosclerosis that occurred in aging individuals were linked to generalized atherosclerosis and renal failure. Based on these evidences, lower ABI, suggesting generalized atherosclerosis, is associated with glomerulosclerosis and arteriosclerosis in the renal interstitium and can predict decline in kidney function.

A study showed that elderly individuals with CKD were also at increased risk of severe coronary artery disease. El Nahas concepted that CKD in elderly is a manifestation of an age-related diffuse vascular damage affecting a number of organs, including the kidneys, heart, brain, and eyes. Based on this concept, a large part of CKD is related to traditional and age-related vascular risk factors, which cause generalized atherosclerosis, suggesting a strong association between kidney function and atherosclerotic diseases, e.g., coronary artery disease and peripheral artery disease (Fig. 1).

Furthermore, Sonoda et al. suggested that higher ABI values are associated with a relatively increased risk of CKD. Although not statistically significant, ABI is elevated in the presence of medial artery calcification and incompressible vessels. Medial artery calcification, i.e., Möncheberg's arteriosclerosis, is the calcification of the tunica media of medium-sized vessels, and it affects patients with end-stage kidney disease or diabetes. In this study, individuals with higher ABI values possibly contained vessels with calcification. Further studies are needed to clarify whether higher ABI values predict the incidence of CKD.

The study conducted by Sonoda et al. is the first report about the relationship between ABI and the incidence of CKD in the Japanese population, and it provides substantial information for clinical practice. Further clinical studies are warranted to accumulate evidence associated with ABI and incidence of CKD.

Conflicts of Interest
None.

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Fig 1. Generalized atherosclerosis causes CKD and vascular diseases