Letter

Diabetes Metab J 2020;44:201-202
https://doi.org/10.4093/dmj.2020.0017
pISSN 2233-6079 · eISSN 2233-6087

dmj
DIABETES & METABOLISM JOURNAL

Presence of Carotid Plaque Is Associated with Rapid Renal Function Decline in Patients with Type 2 Diabetes Mellitus and Normal Renal Function (*Diabetes Metab J* 2019;43:840-53)

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Despite recent advances in the management of diabetes, increased cardiovascular diseases and microvascular diseases including chronic kidney diseases (CKDs) remain a challenge. CKD itself is considered as a strong predictor of cardiovascular disease [1], as previous data showed that older adults with CKD are 6-fold more likely to die from cardiovascular causes than developing end stage renal disease [2].

Diabetic kidney disease (DKD) is one of the strongest risk factor of atherosclerotic vascular disease in diabetes, and therefore it is included as an indication of primary prevention of cardiovascular diseases in patients with diabetes [3]. In patients with DKD, the presence of plaque is significantly more prevalent compared with patient with CKD without diabetes, suggesting an additive role of hyperglycemia in the subclinical atherosclerosis [4]. In addition, another study also showed that diabetes is a major independent risk factor of subclinical atherosclerosis [5]. Although the clinical importance of subclinical atherosclerosis is well-established in DKD, no definite predictive markers for DKD are present so far.

In the recent article entitled 'Presence of carotid plaque is associated with rapid renal function decline in patients with type 2 diabetes mellitus and normal renal function,' by Seo et al. [6], the authors suggest that subclinical atherosclerosis is correlated with subsequent rapid renal function decline independent of other clinical risk factors in patients with type 2 diabetes mellitus [6]. The authors have identified that the presence of carotid plaque (CP), as measured by common carotid intima-media thickness (CIMT) at baseline while renal function is normal, predicts rapid decline of renal function in succeeding 6 years of follow-up. It is noteworthy that this correlation was valid even after adjusting for multiple variables including age, duration of diabetes, and glycosylated hemoglobin (HbA1c) and etc. As the authors have claimed, this study is distinguished from other previous studies in that the study was prospective and exclusively enrolled patients with preserved renal function at the baseline [7,8].

It should be noted that the rapid renal function decliners, who were defined as estimated glomerular filtration rate decline >3.3%/year, had longer duration of diabetes with higher HbA1c and were older at the baseline. Although statistical significance remained even after these confounders were adequately adjusted, it would have been more convincing if age-matched or diabetes duration-matched non-decliners were enrolled and compared with patients with or without baseline CP, given that these two factors are of utmost importance in DKD progression.

In this prospective, multicenter observational cohort, follow-up CIMT indices as well as the degree of glycemic control

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was not shown after baseline. Because it is generally believed that renal vascular supply is decreased in parallel to increased atheroma, combinatorial consideration of temporal changes of CIMT or HbA1c rather than cross-sectional baseline parameters would have better reflected deteriorated renal function.

In addition, although it is postulated that ischemic renal changes caused by atherosclerosis of the intrarenal arteries is the culprit of rapid renal deterioration, it should also be considered that DKD and atherosclerosis also share similar disease entity, i.e., inflammation. The pro-inflammatory milieu in CKD is thought to depend on both innate and adaptive immune system [9]. Accumulating preclinical evidences show increased cytokines in renal fibrosis or DKD [9-11]. Given that low-grade inflammation is also critically involved in the pathogenesis of atherosclerosis, it is also plausible that the patients with CP are more primed with inflammation, although no differences in surrogate marker of inflammation, such as high sensitivity C reactive protein, was noted between these two groups.

Taken together, the article by Seo et al. [6] clearly suggests that early and intensive monitoring of renal function is beneficial in patients with type 2 diabetes mellitus with comorbid CPs in terms of detection of rapid renal deterioration.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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