

Nutrition Society Congress 2024, 2–5 July 2024

Adherence to a healthful plant-based diet and risk of chronic kidney disease among individuals with diabetes: A prospective cohort study

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Chronic kidney disease (CKD) is highly prevalent among people with diabetes^(1,2). While identifying modifiable risk factors to prevent a decline in kidney function among those living with diabetes is pivotal, there is limited evidence on dietary risk factors for CKD. In this study we examined the associations between healthy and less healthy plant-based diets (PBDs) and the risk of CKD among those with diabetes, and to identify potential underlying mechanisms.

We conducted a prospective analysis among 7,747 UK Biobank participants with prevalent diabetes (Type 1 and Type 2). Multivariable Cox proportional hazard regression models were used to examine the associations between healthful and unhealthful plant-based indices (hPDI and uPDI) and the risk of CKD. Fruits, legumes, nuts, tea and coffee, vegetables and whole grains were classified as healthy plant-based foods, whereas fruit juice, potatoes, refined grains, sugary drinks as well as sweets and desserts were classified as unhealthy plant-based foods. Animal-based foods used for the PDIs were grouped into meat, eggs, dairy products, animal fat, seafood or fish, and miscellaneous animal-based foods. Causal mediation analyses were further employed to explore the underlying mechanisms of the observed associations.

Among 7,747 study participants with diabetes, 1,030 developed incident CKD over 10.2 years of follow-up. The mean (SD) age was 58.8 (7.2) years, 6,910 (89.2%) were White, and 3,829 (49.4%) had a BMI over $\geq 30 \text{ kg/m}^2$. Higher adherence to a healthy PBD was associated with a 24% lower CKD risk ($\text{HR}_{\text{Q4 versus Q1}}$: 0.76 [95%CI: 0.63–0.92], $p_{\text{trend}} = 0.002$), while higher adherence to an unhealthy PBD was associated with a 35% higher risk ($\text{HR}_{\text{Q4 versus Q1}}$: 1.35 [95%CI: 1.11–1.65], $p_{\text{trend}} = 0.006$). The observed associations were predominantly mediated by markers of body fatness (proportion mediated: 11–25%) and kidney function (23–89%).

In this prospective cohort study of UK adults with diabetes, adherence to a healthy PBD was associated with lower CKD risk, whereas adherence to an unhealthy PBD was associated with a higher CKD risk. Associations were primarily mediated by markers of lower body fatness and improved kidney function.

References

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