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Association of plant protein intake and risk of incident chronic kidney disease: The UK Biobank study

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Objectives: Dietary interventions have been considered important for chronic kidney disease (CKD) patients to slow disease progression and improve clinical outcomes. However, the association between plant protein intake and incident CKD is uncertain

Methods: Using the UK Biobank prospective cohort, we analyzed this association in 117,809 participants who completed more than one dietary questionnaire and had an estimated glomerular filtration rate (eGFR) ≥60 ml/min/1.73 m^2, urinary albumin-to-creatinine ratio (UACR) <30 mg/g, and no history of CKD. The main predictor was the daily plant protein intake, assessed with a web-based 24-hour recall questionnaire. The primary outcome was incident CKD based on the International Classification of Diseases, 10th Revision (ICD-10) or Office of Population Censuses and Surveys Classification of Interventions and Procedures, version 4 (OPCS-4) codes. We analyzed this association in 37,955 participants with primary care-linked data for eGFR and UACR. We used strictly defined CKD based on codes or two consecutive measures of eGFR <60 ml/min/1.73 m^2 or UACR >30 mg/g.

Results: During the median follow-up of 9.9 years, incident CKD occurred in 3745 (3.2%) participants (incidence rate, 3.2 per 1,000 person-years). In a multivariable cause-specific model, the adjusted hazard ratios (aHRs; 95% confidence intervals [CIs]) for the second, third, and highest quartiles were 0.91 (0.83-0.99), 0.79 (0.71-0.87), and 0.75 (0.64-0.85), respectively, compared with the lowest quartile. In a continuous model, the aHR (95% CIs) per 0.1 g/kg/day plant protein intake increase was 0.91 (0.88-0.94). This beneficial association was also consistent in the secondary analysis with strictly defined CKD and various sensitivity analyses.

Conclusions: This large, prospective cohort study showed that increased dietary plant protein intake was associated with a lower risk of CKD.

Table 1. Incidence rates of incident CKD according to quartile of plant protein intake