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Association of dietary plant protein intake and cardiovascular outcome in those with chronic kidney disease: a UK Biobank study

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Objectives: Protein restriction is important to slow kidney function decline and reduce the complications associated with chronic kidney disease (CKD). It is well-known that plant protein intake is associated with a decreased risk of cardiovascular disease and mortality in the general population. However, the optimal amount of dietary plant protein intake to prevent adverse clinical outcomes is unknown in patients with CKD.

Methods: Using a large prospective cohort from the UK biobank data, this study included subjects with preexisting CKD, defined as an estimated glomerular filtration rate (eGFR) of <60 mL/min/1.73 m^2 or urine albumin to creatinine ratio(UACR) of >30 mg/g. The primary exposure was the daily plant protein intake (g/kg/day), assessed with a web-based 24-hour recall questionnaire. The primary outcome was the composite of incident fatal and nonfatal cardiovascular disease, including death or hospitalization from cardiovascular disease. The secondary outcome was all-cause mortality.

Results: During a median follow-up of 9.9 years, the composite cardiovascular outcome occurred in 494 (4.5%) participants. In the multivariate Cox model treating plant protein intake as a continuous variable, the adjusted hazard ratios (aHRs) (95% confidence interval [CI]) the aHR (95% CIs) per 0.1 g/kg/day increase was 0.89 (0.83 - 0.96). In an additional analysis, aHRs (95% CI) for the composite cardiovascular outcome were 0.69 (0.53 - 0.92) and 0.69 (0.55 - 0.88) for the third and highest quartile of plant protein intake, respectively, compared with the lowest quartile. In secondary outcome analyses, the aHRs (95% CI) for the corresponding plant protein quartiles were 0.77 (0.65-0.91), 0.66 (0.54-0.80), and 0.66 (0.52-0.85) for all-cause mortality.

Conclusions: Higher plant protein intake was associated with a lower risk of cardiovascular disease and mortality in participants with reduced kidney function.

Table 1. Incidence rates of composite cardiovascular outcome and all-cause mortality according to quartiles of plant protein intake in participants with chronic kidney disease