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

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Objectives: It is reported that dietary fiber intake is associated with lower risk of diabetes, cardiovascular diseases, and cancer. However, it is unknown whether dietary fiber has also beneficial influence on incident CKD.

Methods: Using the UK Biobank prospective cohort, 110,412 participants who completed more than one dietary questionnaire and had an estimated glomerular filtration rate (eGFR) ≥ 60 ml/min/1.73 m², urinary albumin-to-creatinine ratio (UACR) < 30 mg/g, and no history of CKD were included. The main exposure was total dietary fiber density, calculated by dividing the absolute amount of daily total fiber intake by energy intake (g/1000 kcal). We also separately used soluble and insoluble fiber densities as additional predictors. The primary outcome was incident CKD based on 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.

Results: Total 3507 (3.2%) participants developed incident CKD during the median follow-up of 9.9 years. In a multivariable cause-specific model, the adjusted hazard ratios (aHRs; 95% confidence intervals [CIs]) for the second, third, and highest quartiles were 0.84 (0.76-0.92), 0.75 (0.67-0.83), and 0.69 (0.61-0.78), respectively, compared with the lowest quartile. In a continuous model, aHR per 1.0g/ 1000 kcal dietary fiber density increase was 0.95 (95% CI, 0.94-0.97). This beneficial association was consistent for both soluble and insoluble fiber densities and not affected by subgroups by sex, age, body mass index, hypertension, smoking, and inflammation.

Conclusions: In this large-scale prospective long-term cohort study, higher dietary fiber density was associated with a lower risk of incident CKD.

Table 1. Incidence rates of incident CKD according to quartile of dietary fiber density