



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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Gluten intake and the Risk of Incident Chronic Kidney Diseases : Prospective findings from UK Biobank

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Objectives : Gluten, the major storage protein of wheat, barley, and rye, has been implicated in systemic inflammation and altered gut permeability, both of which contribute to the pathogenesis of Chronic Kidney Diseases (CKD). However, the direct association between gluten intake and incident CKD remains unexplored. We aimed to examine this association using data from the UK Biobank.

Methods : Gluten intake was estimated from Oxford WebQ 24-hour dietary assessments in 210,950 UK Biobank participants aged 40–69 years. After excluding those with prevalent CKD (eGFR < 60 mL/min/1.73m², urinary albumin-creatinine ratio (UACR) ≥ 30 mg/g, or history of CKD) or implausible energy intake, 203,786 participants were categorized into energy-adjusted gluten quintiles. The primary outcome was incident CKD identified by International Classification of Diseases, 10th Revision (ICD-10) or Office of Population Censuses and Surveys (OPCS-4) codes. Multivariable Cox proportional hazards models were used to estimate hazard ratios (HRs) with sequential adjustment for demographics, lifestyle, clinical factors, and grain subtypes.

Results : Over a median follow-up of 11.5 years, 9,231 incident CKD events (4.5%) occurred. Mean gluten intake was 6.8 ± 3.4 g/day. In the fully adjusted model, gluten intake was not associated with CKD risk (Q5 vs Q1: HR, 0.97; 95% CI, 0.91–1.04; P for trend = 0.269). However, after additional adjustment for refined grain intake, higher gluten intake was significantly associated with lower CKD risk (Q5 vs Q1: HR, 0.87; 95% CI, 0.80–0.95; P for trend < 0.001). Substitution of 50 g/day of refined grain with whole grain was associated with a 4% risk reduction (HR, 0.96; 95% CI, 0.95–0.98; P < 0.001). Restricted cubic spline analysis indicated significant nonlinearity (P = 0.039).

Conclusions : Energy-adjusted gluten intake was not independently associated with incident CKD. However, the dietary source of gluten — whole grain versus refined grain — may be an important determinant of CKD risk, warranting further investigation.