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Dietary patterns associated with kidney function decline and incident chronic kidney disease in the general population: the LifeLines cohort study

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Abstract

Nutrition strongly impacts the incidence and progression of chronic kidney disease (CKD). Recently, reduced rank regression (RRR) has emerged as a method that identifies dietary patterns in an exploratory way while using prior knowledge to select a set of response variables. The aim of this study was to identify a specific dietary pattern associated with renal function using RRR, and to evaluate its association with CKD incidence. We included 78,350 participants from the LifeLines population-based cohort in the Northern Netherlands. All participants were free of CKD (defined as eGFR_{CKD-EPI} < 60 mL/min/1.73 m²) at baseline and completed a second visit four years later. Dietary intake was ascertained with a 110-item food frequency questionnaire. The dietary pattern, stratified by sex, was constructed cross-sectionally by RRR, with eGFR as a response variable. Multivariable logistic regression was used to study the association between dietary patterns score and CKD incidence or an eGFR decline of ≥ 20%, adjusted for potential confounders. Among women, the eGFR-associated dietary pattern was characterized by high intake of eggs, low-fat and high-fat cheese, and legumes and low consumption of sweetened dairy drinks, desserts, cake and cookies, sweet sandwich toppings, white meat, and commercially prepared dishes. The male dietary pattern was characterized by high consumption of high-fat and low-fat cheese, bread, full-fat milk, fruits, vegetables, beer, and low consumption of white and red meat. After a mean follow-up of 3.9 years, 7,612 participants experienced a > 20% eGFR decline and 2,072 participants developed CKD. The eGFR-based diet was associated with a lower risk of eGFR decline (OR 4th vs 1st quartile, women: 0.84 [95% CI 0.76–0.92]; men: 0.74 [0.65–0.84] and of incident CKD (women: 0.60 [0.50–0.73] ; men: 0.52 [0.41–0.66]). The results provide support for potential diet interventions to prevent renal function decline and CKD. RRR may be a useful tool to identify dietary patterns that affect renal function loss and CKD development.

Conflict of Interest

There is no conflict of interest.