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The relationship of fat-carbohydrate ratio with the development of chronic kidney disease: a community-based prospective cohort study

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Objectives: Recent studies have shown that low carbohydrate, high fat diet affect better blood sugar and blood pressure control and consequent low mortality. However, it is complex to determine optimal fat-carbohydrate ratio for prevent chronic kidney disease (CKD) development, because low protein diet is usually recommended to preserve renal function. Therefore, we evaluated the relationship between fat-carbohydrate intake ratio and incident CKD in subgroups of protein intake.

Methods: We included 9226 subjects from the Korean Genome and Epidemiology Study. Subjects were divided into two groups based on protein intake of 1g per ideal body weight (kg) in a day. And each protein intake group was divided into tertiles according to fat and carbohydrate diet ratio. Primary outcome was development of CKD, which was defined as estimated glomerular filtration rate less than 60 mL/min/1.73m^2.

Results:

During a median follow-up of 11.4 years, 778 (8.4%) CKD events occurred. The cumulative incidence of CKD was significantly decreased in higher tertiles in each protein intake group in a Kaplan–Meier curve analysis (P < 0.001, respectively). However, in the multivariable Cox proportional hazard regression analysis, significantly decreased CKD risks in higher tertile groups was only shown in the high protein intake group. (hazard ratio [HR] for T2 (30.1 % - 38.1 % of fat intake) vs. T1 (< 30.1 %), 0.738; 95% confidence internal [CI], 0.569-0.955; P = 0.021, HR for T3 (> 38.1 %) vs. T1, 0.725; 95% CI, 0.545-0.966; P = 0.028), not in the low protein intake group.

Conclusions: A high fat and low carbohydrate intake was associated with decrease risk of CKD in the general population. However, these findings were presented on the base of high protein intake, but not in low protein intake.