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CKD & associated complications

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THE ASSOCIATION OF DIETARY PHOSPHATE TO PROTEIN RATIO WITH METABOLIC SYNDROME : ANALYSIS OF K-NHANES DATA

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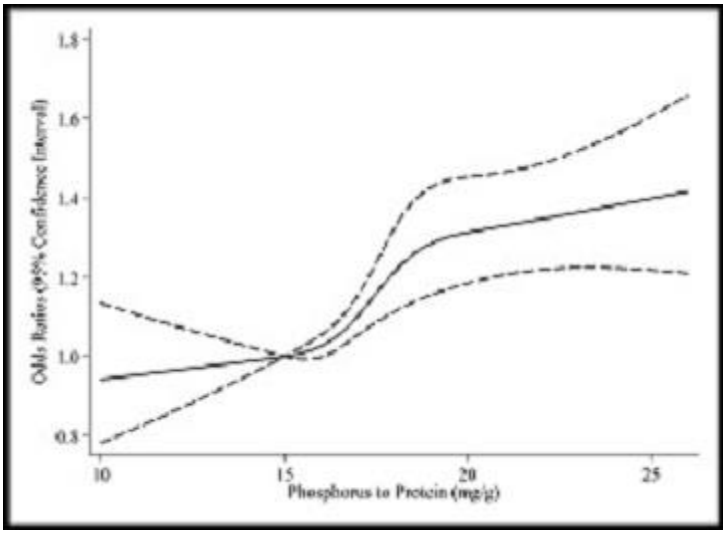
Background: To keep adequate phosphate to protein ratio of dietary intake is important for the control of hyperphosphatemia among hemodialysis patients. However, whether dietary phosphate to protein ratio (p/prot) is also important in general population was unknown. We investigated the association of p/prot with metabolic syndrome.

Methods: We used The Korean National Health and Nutrition Examination survey (K-NHANES) 2005 – 2014 data (n = 45,648). Metabolic syndrome was defined by fulfilling 3 or more among five criteria of the modified National Cholesterol Education Program Adult Treatment Panel III. Data inclusion criteria were as followings : (1) presence of estimated GFR (n = 23,274), (2) presence of nutritional data (n = 24,377), (3) being identifiable as metabolic syndrome (n = 23,131).

Results: Dietary p/prot were various among the population. Divided by quartiles, mean dietary p/prot were 13.4 ± 1.5 mg/g, 16.2 ± 0.6 mg/g, 18.4 ± 0.7 mg/g, 21.9 ± 2.3 mg/g, respectively. Age was showed linear association with p/prot (β=0.058, p<0.001). Protein intake was inversely associated with increased p/prot (β=-0.041, p<0.001). Female ingested higher dietary p/prot than male (17.1 ± 3.3 vs. 17.8 ± 3.5 mg/g, male vs female, p<0.001). A sigmoidal association of p/prot with metabolic syndrome was found. (Figure 1) P/prot higher than 18mg/g had odds ratio (OR) of 1.280 to metabolic syndrome [95% confidence interval (C.I.) 1.192 – 1.374, p<0.001]. Adjusted with sex, body mass index, low educational status, number of moderate-vigorous activities per week and smoking, p/prot showed adjusted OR of 1.262 to metabolic syndrome [95% C.I. 1.163 – 1.370]. However, when age was included in the multiple model, the impact of high p/prot was reduced. [Adjusted OR, 1.084, 95% C.I 0.997 – 1.179, p=0.060]

Conclusion: In K-NHANES population, ingestion of food with high phosphate to protein ratio was associated with metabolic syndrome. High phosphate to protein intake was associated with low protein intake, which requires further dietary pattern analysis. Age might be a significant confounder.

Figures:



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