Association Between Nephrolithiasis Incidence and Nutrition Based on Data from a Japanese National Survey

Introductions and Objective: Continuing surveys in Japan reveal fixed variations in nephrolithiasis incidence among geographic regions. To clarify the association between regional variations in nephrolithiasis incidence and nutrition intake, we evaluated associated data from Japanese national surveys.
Materials and Methods: The incidence of nephrolithiasis in 12 regions of Japan was calculated from 2005 patient data obtained from 430 hospitals (n = 92,797). Nutrition intake data were obtained from the National Health and Nutrition Survey, conducted for each region by the Japanese Ministry of Health, Labour and Welfare. We examined the association between nephrolithiasis incidence and average intake of various types of food (cereals, potatoes, sugars, legumes, vegetables, fruits, seafood, meat, eggs, etc.) or nutrients (proteins, lipids, carbohydrates, salt, potassium, calcium, vitamins, etc.) by region.
Results: The national average of patients with nephrolithiasis was estimated as 203.1 per 100,000 citizens. Compared with this national average, the incidence of nephrolithiasis was higher in South Kyushu and Kinki but lower in Tohoku and Kanto, similar to results from previous surveys. Regarding food, intake of fruit correlated negatively with the incidence of nephrolithiasis ($r = -0.721$, $p = 0.008$) while intake of eggs ($r = 0.537$, $p = 0.072$) and sugar ($r = 0.475$, $p = 0.119$) tended to positively correlate with incidence. Regarding nutrients, intake of potassium ($r = -0.500$, $p = 0.098$), vitamin K ($r = -0.562$, $p = 0.057$), and pantothenic acid ($r = -0.560$, $p = 0.058$) tended to negatively correlate with incidence.
Conclusions: The incidence of nephrolithiasis is higher in geographic areas with populations having low fruit and high sugar intake. The recommendation of increased fruit intake for individual patients may help prevent nephrolithiasis.