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Risk Factors of Vitamin D Deficiency in Korean Adult; Kidney Function and Other Factors

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Background: Vitamin D deficiency has been associated with increased cardiovascular risk, mortality and progression of various chronic diseases including chronic kidney disease (CKD). But, there is limited information about the other factors interacting with the kidney function regarding vitamin D deficiency.

Methods: We examined the association between vitamin D deficiency and CKD by analyzing the data from the Fouth Korea National Health and Nutrition Examination Surveys 2008, consisted of 6529 adults aged 20 years or older. Vitamin D deficiency was defined as a serum 25-hydroxyvitamin D (25(OH)D) ≤20 ng/mL, and the kidney function was estimated by the equation of Modification of Diet in Renal Disease equation.

Results: The overall prevalence rate of vitamin D deficiency was 54.3%, and the mean value of vitamin D showed a tendency of increase in proportion to age from twenties to sixties, pointing out that 25(OH)D level was lowest in the most young-aged group. Though there was a significant positive correlation between 25 (OH)D level and GFR in multiple linear regression models, there was no significant difference in prevalence of vitamin D deficiency between two groups divided by GFR level of less or greater than 60 ml/min/1.73m^2. However, the prevalence of vitamin D deficiency at GFR level of less than 45 ml/min/1.73m^2 was higher than the other, even after adjustment for age, sex, smoking, residential region (urban/rural area), physical activity (regular exercise and walking), other medical co-morbidities; odds ratio: 2.002; 95% confidential interval: 1.169-1.693; p=0.029. In general adults population, vitamin D deficiency was significantly more common among those who were female, young aged, urban resident, seldom exercise, anemic, having proteinuria, without osteoporosis, and also with renal impairment.

Conclusion: Decreased renal function and young aged urban female resident are the prominent predictors of vitamin D deficiency. Based on the above data, the longitudinal observation for the association between vitamin D deficiency and clinical outcome should be studied.

Key Words: Vitamin D, Risk factor, Kidney function