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# Severe Vitamin D Deficiency is a Risk Factor for Renal Hyperfiltration

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**Objectives :** Recent studies suggested that renal hyperfiltration (RHF) is significantly associated with increased risk of all-cause and cardiovascular mortality in relatively healthy adult population as well as diabetic patients. On the other hand, vitamin D deficiency is well known risk factor for renal progression in various diseases. This study aimed to investigate the association between RHF and vitamin D deficiency among relatively healthy adult population.

**Methods :** The data from subjects participated in the Korean National Health and Nutrition Examination Survey (KNHANES) from 2008 to 2015 were collected. A total of 33,210 subjects with normal renal function were included in the final analysis. Estimated GFR (eGFR) was calculated with the Chronic Kidney Disease Epidemiology Collaboration creatinine equation, and RHF was defined as eGFR > 95th percentile after adjustment for age, sex, and history of diabetes and/or hypertension. Severe vitamin D deficiency was defined as serum 25(OH)D < 10 ng/mL.

**Results :** The mean ages of the subjects were 48.1 years and the numbers of female subjects were 18,779 (56.5%). 1,637 (4.9%) subjects were categorized into RHF group. The proportions of hypertension and diabetes were significantly higher in RHF group than those in patients without RHF. According to serum 25(OH) level, the prevalence of renal hyperfiltration was significantly higher in the lowest 25(OH)D group (5.7%, P<0.001). Furthermore, multivariate linear regression analysis showed that 25(OH)D level was negatively associated with eGFR ($\beta$=−0.04, P < 0.001), systolic blood pressure ($\beta$=−0.01, P < 0.001), and fasting plasma glucose ($\beta$=−0.01, P < 0.001). In multivariate logistic regression model, severe vitamin D deficient group showed significantly high odds ratio (OR) for renal hyperfiltration than that in group with 25(OH)D ≥ 30

ng/mL (OR, 2.23; 95% confidence interval, 1.65-2.99; P <0.001).

Conclusions : Severe vitamin D deficiency is significantly associated with increasing prevalence of renal hyperfiltration in a relatively healthy population.

Keywords : vitamin D deficiency, renal hyperfiltration, blood pressure