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Vitamin D deficiency is a risk factor of hematuria: Korean National Health and Nutrition Examination Survey

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Objectives: Vitamin D deficiency is an important health concern because it is related with several comorbidities and mortality. However, its relationship with the risk of hematuria remains undetermined in the general population. Therefore, we analyzed the assocation between vitamin D deficiency and hematuria using national-wised cohort in this study.

Methods: Cross-sectional analysis was applied to the subjects (n=20,240, aged ≥18 years old) using Korean National Health and Nutrition Examination Survey 2010–2014. Serum 25-hydroxyvitamin D [25(OH)D] levels were measured in a central laboratory and hematuria was defined as ≥ 1+ on a dipstick test. Multivariate logistic regression was conducted to calculate the odds ratio (OR) of hematuria risk according to the 25(OH)D quartiles, after adjusting several covariates.

Results: Of study subjects, 10,847 (53.6%) were female and 5,388 (26.6%) were identified as menopause. The mean age and estimated glomerular filtration rates were 49 ± 16.3 year old and 88 ± 17.4 mL/min/1.73 m2, respectively. The number of subjects with hematuria was 3,144 (15.5%). The mean 25(OH)D level was 17.4 ± 6.2 ng/ml [median, 16.6 ng/ml (interquartile range, 13.1–20.8 ng/ml)]. The 3rd and 4th quartiles had a higher risk of hematuria than the 1st quartile, as following adjusted ORs; 1.15 (1.019-1.129) and 1.4 (1.244-1.574) in the 3rd and 4th quartiles, respectively. However, this relationship was only significant in the female subjects, not in the male subjects. When stratified analyses were done by the menopausal status, there was no significant increase of hematuria risk according to the quartiles in premenopausal females. However, for the postmenopausal females, the increased risk of hematuria was shown in all the higher quartiles, compared with the 1st quartile.

Conclusions: Vitamin D deficiency was correlated with hematuria in female subjects, particularly after menopause. Further interventional studies are warranted to address whether the correction of vitamin D deficiency lowers the hematuria risk.