

POSTER PRESENTATION

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# A lack of association between vitamin d-binding protein and 25-hydroxyvitamin d concentrations in pediatric type 1 diabetes without microalbuminuria

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The risk of vitamin D deficiency might increase along with the increased urinary loss of vitamin D binding protein (VDBP) consequent to impaired 25-hydroxyvitamin D (25-OHD) circulation. We aimed to evaluate the possible increased urinary loss of VDBP, a correlation between VDBP and circulating 25-OHD levels, and the risk factors influencing low vitamin D levels in pediatric type 1 diabetes patients without microalbuminuria.

Subjects with T1DM without microalbuminuria (n=45) and age-matched healthy control subjects (n=29), aged 9–14 yr, residing in Seoul and the Gyeonggi-Do in Korea (37°N) were studied. Height, weight and pubertal stage were evaluated. The percentage of body fat was measured by bioelectrical impedance analysis (inbody). A questionnaire was used to assess the amount of daylight outdoor activity and vitamin D intake. Serum levels of calcium, phosphorus, intact parathyroid hormone, 25-OHD, 1,25 dihydroxyvitamin D and VDBP, as well as urinary levels of VDBP, microalbumin and creatinine (Cr) were measured. 25-OHD deficiency was defined as  $\leq 20$  ng/mL.

The urinary VDBP to Cr ratio (VDBPCR) in type 1 diabetes patients was higher than that in the control group ( $P = 0.016$ ) and correlated positively with the urinary microalbumin to Cr ratio in both groups ( $P < 0.001$ ). The serum 25-OHD levels did not correlate with the serum VDBP or urinary VDBPCR. A multivariate regression analysis including known vitamin D

deficiency risk factors (age, gender, body fat percentage, vitamin D intake, daylight outdoor hours, and urinary VDBPCR) revealed that daylight outdoor hours ( $\beta = 2.881$ ,  $P = 0.009$ ) and vitamin D intake ( $\beta = 2.342$ ,  $P = 0.050$ ) affected the 25-OHD levels in type 1 diabetes patients.

In pediatric type 1 diabetes patients without microalbuminuria, the urinary VDBP loss was increased proportionally with the urinary mACR. However, the urinary VDBPCR did not correlate with the serum 25-OHD levels. The factors associated with 25-OHD levels during winter periods were daylight outdoor hours and vitamin D intake.

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