

신장이식 환자에서 비타민 D 결핍과 감염 위험도의 관계

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Vitamin D Deficiency is associated with Increased Infection Risks in Patients with Kidney Transplantation

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Background: Recent studies demonstrated that vitamin D played indispensable roles in immune system. However, to our knowledge, there has been no report on the association between vitamin D deficiency and infection among kidney-transplanted patients. Therefore, this study was aimed to investigate whether vitamin D deficiency was related to the development of infection after kidney transplantation.

Methods: We analyzed a retrospective cohort of 105 patients who received kidney transplantation between April 2002 and June 2004. 25-hydroxyvitamin D [25(OH)D] levels were measured in all patients within two weeks before transplantation. Vitamin D deficiency was defined as 25(OH)D \leq 10 ng/mL. Primary outcome was a composite of infection-related mortality and hospitalization, and secondary outcome was the incidence of bloodstream infection and/or urinary tract infection (UTI).

Results: The mean age of subjects was 40.5 \pm 10.7 years, and 75 patients (71.4%) were male. The mean 25(OH)D levels were 13.12 \pm 6.23 ng/mL, and 40 patients (38.1%) were deficient in vitamin D. Vitamin D deficiency was associated with female and low levels of hemoglobin, and serum calcium and albumin in univariate logistic regression analysis. Moreover, low serum albumin concentrations were revealed to be significantly related to vitamin D deficiency in multivariate analysis. During the median follow-up duration of 10.7 years, 63 patients (60.0%) and 22 patients (21.0%) reached to primary and secondary outcomes, respectively. The patients with vitamin D deficiency had a significantly higher incidence of UTI compared to those without vitamin D deficiency (27.5% vs. 7.7%, p=0.01). In addition, the incidence rates of UTI were significantly lower in the vitamin D deficient group (log-rank test, p=0.01). However, there were no significant differences in both primary outcome and bloodstream infection between the two groups. Multivariate Cox regression analysis showed that vitamin D deficiency was an independent predictor for UTI episodes after adjustment for age, sex, timing of 25(OH)D assessment, body mass index, and serum albumin and calcium levels (hazard ratio: 6.19, 95% confidence interval: 1.47-26.08, p=0.01).

Conclusion: Vitamin D deficiency at the time of kidney transplantation was significantly associated with future UTI in kidney transplants.

Key Words: 요로감염, 신장이식, 비타민 D 결핍

UTI, Kidney transplantation, Vitamin D deficiency