유지혈액투석 환자에서 혈중 비타민 D 농도 및 심혈관계 지표들과의 관련성

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Vitamin D Levels and Their Relationship to Cardiac Biomarkers in Chronic Hemodialysis Patients

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Background : Hemodialysis (HD) patients demonstrate profound reductions in 1,25- dyhydroxyvitamin D (1,25D) and are also at high risk for 25- hydroxyvitamin D (25D) deficiency . Vitamin D deficiency may be associated with cardiovascular disease, the most common cause of mortality in HD patients.

Methods: To evaluate the relation between blood levels of 25D and 1,25D with cardiac biomarkers, we measured 25D, 1,25D, cardiac troponin T (cTnT) and N- terminal pro- B- type natriuretic peptide (NT- pro- BNP) in a cross- sectional analysis. The chronic stable HD patients without documented ischemic heart disease or congestive heart failure were enrolled.

Results : Seventy- three patients (M:F=35:38, age 51.6±12.9 years, DM 38.4%) was analyzed. Among the patients, 8 had been received active vitamin D therapy. Mean 25D concentration was 18.3 ng/ml (SD 11.2 ng/ml), and mean 1,25D was 4.5 pg/ml (SD 7.0 pg/ml). Sixty- six (91.4%) patients were considered 25D deficiency (< 30 ng/ml) with 15 (20.5%) considered severe deficiency (< 10 ng/ml). Excluding patients on active vitamin D therapy, corrected total calcium, phosphate, and intact parathyroid hormone (iPTH) levels poorly correlated with both 25D and 1,25D levels. 25D concentration was significantly associated with 1,25D concentration (spearman's rho = 0.354, p=0.004). 25D levels was negatively correlated with cTnT (spearman's rho = - 0.438, p<0.001) but not with NT- pro- BNP levels (spearman's rho=- 0.171, p=0.173). 1,25D levels did not showed a relationship to cardiac biomarkers. In multivariate analysis, low 25D concentration and male were independent factors associated with cTnT elevation (β=- 0.459, p<0.001 and β=0.421, p<0.001, respectively).

Conclusion : In HD patients, not only 1,25D but also 25D is commonly deficient, correlates poorly with serum calcium, phosphate and iPTH. Lower 25D levels seem to be associated with cTnT elevation predicting worse cardiovascular outcome in HD patients. The impact on cardiovascular system of vitamin D deficiency is important issue in chronic kidney disease, and further investigation should be required.

Key Words : 심혈관계 질환, 혈액투석, 비타민 D
Cardiovascular disease, Hemodialysis, Vitamin D