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혈액투석 중인 이차성 부갑상선 기능 항진증 환자에서 칼시트리올 투여가 sRAGE, EN-RAGE 혈청 농도에 미치는 영향에 관한 연구

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The Influence of Calcitriol Treatment on Circulating Levels of Soluble Receptor of Advanced Glycation End Product (sRAGE), S100A12 (EN-RAGE) in Hemodialysis Patients with Secondary Hyperparathyroidism

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Background: Hemodialysis (HD) patients with secondary hyperparathyroidism (SHP) commonly suffer from inflammation and vascular complications, andthe receptor for advanced glycation end products (RAGE) has emerged as a central regulator of vascular inflammation and atherosclerosis. Soluble RAGE (sRAGE) and extracellular RAGE-binding protein (EN-RAGE) represent anti-inflammatory and pro-inflammatory ligands for RAGE, respectively, upon the development of atherosclerotic vascular complications. However, the influence of vitamin D treatment on these RAGE proteinsre-mains unknown. This study evaluated the influence of vitamin D therapy on RAGE proteins and inflammatory markers in HD patients with SHP.

Methods: We designed this prospective study to investigate whether calcitriol treatment affects the inflammatory response and RAGE protein levels in HD patients with SHP. Fifty-one long-term HD patients (mean age 52.6±14.7 years, 26 males and 25 females) were enrolled in the study to receive calcitriol treatment, andwe evaluated the changes in the log-transformed values of sRAGE, EN-RAGE, and IL-6 before and at the end of the 8-week calcitriol treatment.

Results: All patients with SHP had low serum 1,25 dihydroxyvitamin D3(1,25D) levels and elevated intact parathyroid hormone (iPTH) levels. After calcitriol treatment, the serum levels of 1,25D were significantly increased, whereas the serum iPTH levels were decreased. In addition, the sRAGE levels were effectively increased, whereas those of IL-6 were significantly decreased after calcitriol treatment. However, the levels of EN-RAGE were unexpectedly increased after calcitriol treatment. A positive correlation between 1,25D and sRAGE levels ($r=0.609$, $p<0.001$) and a negative correlation between sRAGE and EN-RAGE levels ($r=-0.368$, $p=0.020$) were detected after calcitriol treatment.

Conclusion: Our findings suggest that calcitriol treatment effectively increases the level of anti-inflammatory sRAGE, which could play a crucial anti-inflammatory role in HD patients with SHP. However, calcitriol treatment unexpectedly increased the levels of pro-inflammatory EN-RAGE; thus, further studies are needed to clarify the relationship between vitamin D and RAGE proteins.

Key Words: 칼시트리올, 최종당화산물 수용체, 혈액 투석
Calcitriol, RAGE, Hemodialysis