Denosumab effects on bone turnover markers in hemodialysis patients with osteoporosis

메리놀병원 내과

*오동한, 이희룡, 안정명, 이동렬

Background/Aims: Osteoporosis commonly develops morbimortality in hemodialysis patients. As a fully human monoclonal antibody to receptor activator of nuclear factor kappa-B ligand (RANKL), denosumab can be used in hemodialysis patients with osteoporosis. Bone biomarkers are an index for non-invasive bone quality evaluation that reflects the bone turnover rate. We aim to observe the changes in bone index after denosumab administration in hemodialysis patients with osteoporosis. **Methods:** We conducted a World Health Organization–compliant bone mineral density test for diagnosis of osteoporosis on 193 hemodialysis patients (113 men and 80 women) aged 40 years or older. For patients receiving dialysis after diagnosis of osteoporosis, we checked the baseline bone turnover marker at the start of each dialysis session. After the dialysis, denosumab 60 mg was administered via subcutaneous administration. Then, we rechecked the bone turnover marker after six months after, prior to the second denosumab administration. For the bone turnover markers, C-telopeptide of type 1 collagen (CTX) was used for bone resorption, while osteocalcin was used for osteoblastic activity. **Results:** Out of the 71 patients diagnosed with osteoporosis, 39 patients (7 men and 32 women) who were administered denosumab were measured for the bone turnover marker. Average age was 65.93 ± 11.58 years, and average dialysis period was 63.82 ± 110.51 months. Baseline CTX was 2.09 ± 1.01 ng/mL, and osteocalcin at 139.05 ± 70.84 ng/mL. For the measurements after six months after denosumab, CTX was 1.20 ± 0.83 ng/mL, showing a significant decrease ($p<.001$), while osteocalcin was 74.67 ± 63.29 ng/mL, showing a significant decrease compared to the baseline ($p<.001$). Both bone indexes showed more than a 30% decrease compared to the baseline, proving the effectiveness of denosumab treatment in hemodialysis patients with osteoporosis. **Conclusions:** Bone index allows the prediction of bone loss and risk of fracture. Not only is it a strong method in evaluating its treatment effect on osteoporosis, but such index can also be used to observe the effectiveness of denosumab on osteoporosis in hemodialysis patients.