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Serum calcium change during 3 months in hemodialysis patients treated with denosumab

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Objectives: Hemodialysis (HD) patients are at high risk for osteoporosis. Among antifracture agents, denosumab can be used irrespective of renal function and can be used in HD patients. The use of this denosumab induces hypocalcemia. We would like to see a 3 months serum calcium change in HD patients who received first dose of denosumab.

Methods: Bone mineral density (BMD) was checked in patients undergoing hemodialysis and osteoporosis was diagnosed according to WHO criteria. A denosumab was given to patients diagnosed with osteoporosis. Hypocalcemia was defined as <8.5 mg/dL. Dialysate calcium, calcitriol, intravenous calcium gluconate, and phosphate binders were adjusted according to serum chemistries.

Results: 45 patients (37 women, 82.2%) were diagnosed with osteoporosis. The baseline mineral metabolism lab was composed of calcium 9.1 ± 0.5 mg/dL, phosphorus 4.3 ± 1.3 mg/dL, intact parathyroid hormone 238.2 ± 182.7 pg/ml, 25-hydroxyvitamin D 9.5 ± 4.0 ng/ml, osteocalcin 130 ± 72.7 ng/ml, and C-telopeptide of collagen type 1 2.0 ± 1.0 ng/ml. The mean serum calcium over the post-treatment period was as follows; 8.1 ± 0.7 mg/dL after 1 week, 8.9 ± 0.9 mg/dL after 2 weeks, 8.6 ± 0.8 mg/dL after 3 weeks, 8.8 ± 1.0 mg/dL after 1 month, 8.4 ± 0.8 mg/dL after 2 months, 8.9 ± 1.0 mg/dL after 3 months. The percentage of hypocalcemia was as follows; 75% after 1 week, 33% after 2 weeks, 35% after 3 weeks, 40% after 1 month, 48% after 2 months, 46% after 3 months. There were two cases of hospitalization for symptoms induced by hypocalcemia during this period.

Conclusions: Hypocalcemia is a well-known mineral metabolism effect of denosumab. In this study, the risk of hypocalcemia was greatest at 1 week after initiation of treatment. In view of this pattern, we should think about the program to prevent hypocalcemia at the beginning of denosumab treatment.