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Clinical implication of magnesium in dialysis patients

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Objectives: Vascular calcification (VC) is highly prevalent in end-stage renal disease (ESRD). Magnesium (Mg) plays a central role as an inhibitor on VC. We evaluated the clinical implication of magnesium in Korean dialysis patients.

Methods: The prospective cohort study was conducted at eighteen nephrology centers in major university hospitals throughout Korea. Adult (age ≥ 19 years) patients with end-stage renal disease (ESRD) who had been receiving maintenance dialysis therapy for more than 3 months were screened, and 900 patients were enrolled. The eligible subjects were evaluated at baseline for clinical information and laboratory results including abdominal aortic calcification scores (AACS).

Results: In total, 862 subjects's baseline Mg were measured and categorized into quintiles. Serum levels for quintiles of Mg were Mg ≤ 2.1, 2.1 < Mg ≤ 2.4, 2.4 < Mg ≤ 2.6, 2.6 < Mg ≤ 2.9, and Mg > 2.9 mg/dL. Higher levels of Mg were associated with lower Charlson Comorbidity Index (CCI) scores and C-reactive protein (CRP). They were also related to higher levels of albumin, kalium, uric acid, corrected calcium (c-Ca), phosphorous (P), and ionized calcium (i-Ca). Patients with lower Mg were more likely to be men who had heart disease and took a Ca-based P-binder, vitamin-D analogues, statins, anticoagulants, and proton pump inhibitor (PPI). In terms of vascular calcification, there was no significant difference between the 5 groups.

Conclusions: Magnesium is well known as an inhibitor of VC. In this cross-sectional study, magnesium did not show a direct association with VC, but did show a significant relationship with nutrition related factors. These results suggest that magnesium itself does not directly inhibit vascular calcification, but may prevent or delay vascular calcification through mechanisms related to nutritional modulation.