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**Effect of magnesium on vascular calcification in CKD patients: Results from the KNOW-CKD study**

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**Objectives:** Vascular calcification is a non-traditional risk factor for cardiovascular disease in patients with chronic kidney disease (CKD) and main cause of this is disturbance in the mineral and bone metabolism. Magnesium (Mg) is known as a calcification inhibitor. However, a longitudinal study of the effects of Mg on vascular calcification in CKD patients is rare.

**Methods:** This is the prospective, multi-center, longitudinal cohort study of 1,983 patients with pre-dialysis CKD patients at all stages who examined serum Mg. We investigated the association between low level of serum Mg and vascular calcification progression. Patients were divided into four quartiles of serum Mg. The primary end point is vascular calcification progression, defined as the change in abdominal aortic calcification (AAC) score per year  $>0$ . The secondary end points included coronary artery calcium (CAC) progression, and arterial stiffness progression assessed by heart-femoral pulse wave velocity.

**Results:** During a median follow-up of 5.1 [3.4–6.8] years, 185 (30.4%) patients developed vascular calcification progression. In a multivariable logistic regression model, the lowest quartile of Mg was associated with risk of vascular calcification progression (Q4, serum Mg  $<2.1$  mg/dL, odds ratio (OR) 1.68 [1.00–2.82];  $P=0.048$ ; Q2, serum Mg  $2.1 \leq <2.3$  mg/dL, reference group). Subgroup analysis showed that low level of Mg is particularly associated with a higher risk of vascular calcification progression in low body mass index group ( $<25$  kg/m<sup>2</sup>), in high total cholesterol group ( $\geq 171$  mg/dL), in high serum calcium group ( $\geq 9$  mg/dL), in advanced CKD group, and in those with uncontrolled hypertension. The lowest quartile of Mg is also associated with risk of CAC progression and arterial stiffness progression.

**Conclusions:** Low level of Mg is associated with increased risk of vascular calcification progression in CKD.