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Serum Levels of osteoprotegerin are associated with obesity in chronic kidney disease

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Objectives: Osteoprotegerin (OPG), which is an osteoclastic inhibitory factor, is associated with type 2 diabetes mellitus, severity of vascular calcification, and chronic kidney disease. Obesity is a risk factor for diabetes, and cardiovascular disease, however there are few studies about the relationship between OPG and obesity, especially in patients with CKD. This study aimed to investigate association between OPG level and obesity in a large-scale prospective cohort.

Methods: Among 2,238 patients with non-dialysis CKD enrolled in the KoreaN cohort study for Outcome in patients With Chronic Kidney Disease (KNOW-CKD), 1,970 patients who measured body mass index (BMI), and waist circumference (WC) and OPG level were included in the analysis. Obesity were defined as having a BMI >25 kg/m^2 and WC > 90 cm in male, > 85 cm in female.

Results: The mean age was 53.6 ± 12.2 years and 1,196 (60.7%) patients were males. At baseline, obesity by BMI, WC, and composite of BMI and WC were found in 814 (41.3%), 208 (26.9%) and 1,137 (57.7%) patients. A multivariate logistic regression model showed that log transformed OPG level was independently associated with the prevalence of obesity by BMI, WC, composite of BMI and WC (odds ratio [OR], 0.33; 95% confidence interval [CI], 0.16-0.65, P<0.001 and OR, 0.37; 95% CI, 0.18-0.75, P=0.006, and OR, 0.33, 95% CI, 0.16-0.69, P=0.003, respectively). Among patients without baseline obesity, 207 (19.3%) patients developed obesity by BMI, 202 (21.7%) by WC, and 194 (23.3%) by composite of BMI and WC. In the fully adjusted multivariable Cox models, risks of developing obesity by BMI, WC and composite of BMI and WC were significantly higher with increased level of OPG (hazard ratio [HR], 0.59; 95% CI, 0.38-0.92; P=0.019, HR, 0.63; 95% CI, 0.41-0.98; P=0.001).

Conclusions: We showed that serum OPG levels are associated with obesity in patients with non-dialysis CKD.