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Association between Chronic Kidney Disease and Muscle Strength in Korean Population

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Objectives : The objective of the present study was to evaluate the clinical association between chronic kidney disease (CKD) and muscle strength in Korean population.

Methods : We recruited 4542 patients who were available for data regarding estimated glomerular filtration rate (eGFR) and handgrip strength and 18 years and older. CKD was defined as estimated glomerular filtration rate < 60 mL/min/1.73 m². Muscle weakness was measured using handgrip strength and defined as <22.4kg in men and <14.3kg in women.

Results : The number of participants with and without CKD was 176 and 4366, respectively. The proportion of muscle weakness was higher in patients with CKD than in those without CKD (1.1% for patients without CKD and 4.0% in patients with CKD; $P < 0.001$). The eGFR values were positively correlated with the handgrip strength ($r = 0.235$ in men and $r = 0.169$ in women; $P < 0.001$). Univariate and multivariate linear regression analyses showed that the presence of CKD was inversely associated with handgrip strength, with multivariate analyses yielding a standardized $\beta \pm$ standard error of the presence of CKD of -0.036 ± 0.469 ($P < 0.001$). Handgrip strength in patients with and without CKD was 32.8 ± 10.2 and 29.6 ± 9.0 kg, respectively ($P < 0.001$). Multivariate analyses yielded similar results.

Conclusions : Our study showed that the CKD may be associated with a higher prevalence of muscle weakness and lower handgrip strength in the Korean population.

Keywords : chronic kidney disease, handgrip strength, weakness