Hand grip strength and chronic kidney disease: The Results from the Korea National Health and Nutrition Examination Survey 2014-2015

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Objectives: Hand grip strength (HGS) is a type of muscle strength that can be easily measured and the decrease in HGS is a predictor of morbidity and mortality in various chronic diseases. However, it is not known whether low HGS is a risk factor for CKD. The aim of this study was to determine the association of HGS with CKD through large national health survey data.

Methods: In this cross-sectional study, we analyzed 7,905 adults from Korea National Health and Nutrition Examination Survey (KNHANES) 2014-2015. The HGS was measured using a digital dynamometer (Model T.K.K.5401, Takei Scientific Instruments Co., Ltd., Niigata, Japan). Participants were divided into four groups according to their quartiles of HGS. CKD was defined as eGFR < 60 ml/min per 1.73 m² or urine dipstick albumin ≥ +1. Sarcopenia was defined as HGS < 26 Kg (male) or < 18 Kg (female). We used logistic regression analysis to determine the relationship between HGS and CKD.

Results:

There were 993 (7.8%) patients with CKD in the study population. The prevalences of CKD were 9.6, 6.9, 9.3 and 6.4 % for the 1st through 4th quartiles of HGS, respectively (P=0.010). Multivariate logistic analysis showed the odds ratios (95% CI) for CKD were 1.56 (1.15-2.11), 1.62 (1.11-2.37) and 2.12 (1.34-3.35) for 3rd through 1st quartiles compared with 4th quartile of HGS. Similarly, the odds ratio (95% CI) for CKD was 1.52 (1.06 - 2.19) in the participants with sarcopenia compared to those without sarcopenia.

Conclusions: Low HGS was independently associated with the high risk of CKD in representative Korean adults. HGS could be a simple and useful tool for screening individuals at high risk for CKD. In people with low HGS, we should make efforts to lower the risk of CKD and to detect CKD early.