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Clinical Applications of Body Composition and Muscle Strength in CKD

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It is well-documented that protein energy wasting, obesity and volume overload are highly prevalent in patient with chronic kidney disease (CKD), but regular assessment of body composition is not routinely recommended in these patients. In patients with CKD, muscle wasting and obesity can occur simultaneously without changes in body weight, and body mass index (BMI) is not sensitive enough to assess body compositional changes in these patients. Moreover, BMI does not reflect differences in fat distribution, which is strongly associated with cardio-metabolic risk. Sarcopenia has become recognized as an important prognostic marker in various populations, and of the components of sarcopenia, muscle strength has recently been recognized as being more important than muscle mass. We performed bioimpedance spectroscopy (BIS) and handgrip strength (HGS) in patients with dialysis dependent CKD and non-dialysis CKD. As the duration of dialysis increases, muscle strength and mass may fall, associated with more severe disability and increased mortality. We found that renal function and mode of dialysis affected body composition and muscle strength, sarcopenia was a strong predictor of cardiovascular events and all cause-mortality in hemodialysis patients, baseline nutritional status or biochemical parameters were not associated with longitudinal body compositional changes and classical nutritional surveillance markers were poorly associated with body composition and HGS in patients with CKD. These results suggest that measurement of body composition and muscle strength may provide additional prognostic information and some clues to help prescribe individualized nutritional interventions.

Keywords: chronic kidney disease , body composition , muscle strength , bioimpedance spectroscopy, handgrip strength