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The Prognostic Value of Handgrip Strength on Survival in Hemodialysis Patients

Kyungho Park[1], Seongyeop Jeong[1], Hyerim Park[2], Eu Jin Lee[1], Young Rok Ham[1], Ki Ryang Na[1], Dae Eun Choi[1]
[1]Department of Internal Medicine-Nephrology, Chungnam National University Hospital, Korea, Republic of
[2]Department of Department of Medical Science, Medical School, Chungnam National University, Korea, Republic of

Objectives : Patients undergoing hemodialysis experience significantly increased mortality risk, emphasizing the need for precise clinical assessments. Protein-energy wasting (PEW) contributes to muscle loss and frailty, which are closely linked to poor outcomes, including heightened mortality rates. As muscle mass declines, functional performance deteriorates, underscoring the importance of regularly evaluating both muscle quantity and functionality. Handgrip strength (HGS), a simple and effective measure of muscle strength, can serve as a valuable indicator of patient prognosis. This study examines the prognostic significance of HGS for survival among hemodialysis patients, exploring its relationship with muscle mass and body mass index (BMI).
Methods : We conducted a retrospective cohort analysis of 408 dialysis patients (221 males, 187 females) assessed with bioimpedance spectroscopy (BIS) and HGS tests from March 2021 to August 2023. Variables collected included BIS measurements, HGS, dialysis-related information, age, complete blood counts, biochemical profiles, mortality data, and CONUT scores.
Results : Cox proportional hazards analysis indicated that lean tissue index (LTI) (HR 3.30, 95% CI 1.75–6.19), BMI (HR 2.65, 95% CI 1.17–6.01), and HGS (HR 4.22, 95% CI 2.05–8.70) significantly predicted survival across the entire cohort. In gender-specific analyses, male survival was significantly predicted by both LTI (HR 4.81, 95% CI 1.89–12.23) and HGS (HR 5.45, 95% CI 2.18–13.61). Among female patients, HGS strongly predicted survival (HR 6.01, 95% CI 2.42–14.94), and LTI also showed significance (HR 3.22, 95% CI 1.24–8.40, p = 0.017). In multivariate analyses adjusted for age, diabetes mellitus, hypertension, BMI, fat tissue index, LTI, serum albumin, C-reactive protein, and CONUT score, HGS independently remained a significant predictor for survival, especially among female dialysis patients (HR 2.77, 95% CI 1.00–7.65, p = 0.049).
Conclusions : Handgrip strength is a critical prognostic indicator for survival among hemodialysis patients, particularly in females, independent of muscle mass and BMI.