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Sarcopenia Is Independently Associated with Hyporesponsiveness to Erythropoietin-Stimulating Agents in Patients with Pre-Dialysis Chronic Kidney Disease

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Objectives : Erythropoietin-stimulating agent (ESA) hyporesponsiveness is linked to adverse outcomes in chronic kidney disease (CKD) patients. Despite shared pathophysiological mechanisms, evidence connecting ESA hyporesponsiveness and sarcopenia remains limited. This study aimed to explore the association between sarcopenia and ESA responsiveness in pre-dialysis CKD patients.

Methods : A total of 572 pre-dialysis CKD patients with an estimated glomerular filtration rate (eGFR) < 60 ml/min/m² were included in this cross-sectional analysis. ESA hyporesponsiveness was evaluated using the erythropoietin resistance index (ERI), calculated as the monthly continuous erythropoietin receptor activator (CERA) dose per kilogram of body weight divided by hemoglobin levels, with the highest tertile defined as the hyporesponsive group. Sarcopenia was assessed using skeletal muscle index derived from computed tomography imaging.

Results : Univariate logistic regression identified sarcopenia, eGFR, serum albumin, C-reactive protein (CRP), intact parathyroid hormone (PTH), ferritin, and transferrin saturation as factors associated with ESA hyporesponsiveness. Multivariable logistic regression confirmed sarcopenia as an independent predictor of ESA hyporesponsiveness (odds ratio [OR]: 3.46; 95% confidence interval [CI]: 1.98–6.05, $P < 0.001$). Other factors, including eGFR, serum albumin, CRP, intact PTH, ferritin, and transferrin saturation, also retained their independent associations.

Conclusions : This study highlights an independent link between sarcopenia and ESA responsiveness in pre-dialysis CKD patients. Future prospective studies are warranted to evaluate whether managing sarcopenia could improve ESA responsiveness in this population.