Low skeletal muscle mass is associated with mortality in kidney transplant recipients

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Background: Muscle wasting in chronic kidney disease is associated with increased cardiovascular events, morbidity, and mortality. However, whether pre-transplant skeletal muscle mass affects kidney transplant outcomes remains undetermined.

Methods: To examine the impact of skeletal muscle mass on transplant outcomes, we analyzed 623 patients who underwent kidney transplantation between 2004 and 2019. We measured the cross-sectional area of total skeletal muscle at the third lumbar region from a pre-transplant computed tomography scan. Low muscle mass was defined as the sex-specific lowest quartile of the skeletal muscle index.

Results: During the follow-up period, 44 patients (7.1%) died and 54 patients (8.7%) experienced death-censored graft loss. The 1-year, 3-year, and 5-year overall graft survival rates were 92.9%, 87.4%, and 82.8% for the low muscle mass group and 96.6%, 93.8%, and 91.4% for the high muscle mass groups, respectively ($P=0.003$). A multivariable Cox regression analysis confirmed that low muscle mass was independently associated with all-cause mortality (hazard ratio [HR], 3.881; 95% confidence interval [CI], 1.613–9.336; $P=0.002$) and overall graft loss (HR, 2.329; 95% CI, 1.301–4.169; $P=0.004$). By contrast, death-censored graft survival rates were comparable between low and high muscle mass groups. Low muscle mass was also associated with an increased risk of hospital readmission within 1 year after transplant.

Conclusions: Pre-transplant low skeletal muscle mass is associated with increased risk mortality and hospital readmission after kidney transplantation.

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