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Distinct Trajectories of Muscle Mass Changes in Hemodialysis Patients: The Impact of Nutritional Status and Clinical Factors

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Objectives : Muscle wasting is a common complication in hemodialysis (HD) patients, often resulting in reduced quality of life and increased mortality. This study aimed to identify distinct trajectories of muscle mass changes over time and explore the clinical factors associated with these patterns in HD patients.
Methods : This prospective cohort study analyzed 283 HD patients who underwent body composition monitoring at least three times over intervals of 6-12 months. The percentage change in appendicular skeletal muscle (ASM)/m^2 was calculated, and trajectory modeling were performed based on Bayesian Information Criterion values. For nutritional status assessment, we used geriatric nutritional index (GNRI).
Results : During the mean follow-up of 24 months, BCM monitoring frequency was: 3 times (34.6%), 4 times (39.2%), 5 times (23.3%), and ≥6 times (2.8%). Three distinct LTI trajectories were identified: increasing (13.8%), mild decline (59.4%), and progressive decline (26.9%). Mean annual changes in muscle mass for these 3 groups were +11.9 ± 7.4%, -2.3 ± 4.8%, and -12.8 ± 7.4%, respectively. Patients in the progressive decline group were significantly older, had multiple cardiovascular (CV) comorbidities, and higher inflammatory condition. In addition, GNRI score was much lower in this group, showing 34.7% of patients with progressive muscle decline showed a low GNRI less than 90. After adjustment for multiple risk factors, GNRI <90 was associated with 11.5-fold increased risk of progressive muscle mass decline.
Conclusions : This study identified three distinct muscle mass trajectories in HD patients, with progressive decline observed in 27%. Managing modifiable factors particularly nutritional status is crucial to mitigate muscle loss and improve clinical outcomes.

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