Clinical impact of improving sarcopenia through cardiac rehabilitation in patients with heart failure

S. Shakuta1, T. Noda1, K. Kamiya1, N. Hamazaki2, K. Nozaki2, T. Ichikawa2, M. Yamashita1, S. Uchida1, E. Maekawa3, M. Yamaoka-Tojo3, A. Matsunaga1, J. Ako3

1Kitasato University Graduate School of Medical Sciences, Sagamihara, Japan; 2Kitasato University Hospital, Rehabilitation, Sagamihara, Japan; 3Kitasato University School of Medicine, Cardiovascular Medicine, Sagamihara, Japan

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Background: Sarcopenia is highly prevalent in patients with heart failure (HF) and is associated with a poor prognosis and a low quality of life. On the other hand, cardiac rehabilitation (CR) has improved clinical outcomes in patients with HF. However, the clinical impact of improving sarcopenia after CR in patients with HF is unclear.

Purpose: This study aimed to investigate whether improved or not improved sarcopenia is associated with mortality and the number of readmissions for HF in patients with HF.

Methods: We reviewed a total of 647 patients who were admitted for HF treatment and underwent a 5-month outpatient CR after discharge. We assessed sarcopenia at discharge, 3 months and 5 months of outpatient CR, based on Asian Working Group for Sarcopenia 2019 diagnostic criteria. For subjects assessed for sarcopenia at both 3 and 5 months, the assessment results at 5 months were used in the analysis. All patients were classified according to the presence of sarcopenia at baseline and the time of outpatient CR as follows: patients without sarcopenia were the robust group, those with sarcopenia at baseline but improving at the time of outpatient CR were the improved group, and those with sarcopenia at baseline and at the time of outpatient CR were the non-improved group. To assess mortality between the robust, improved, and non-improved groups, we used multivariate Cox proportional hazard analyses. Additionally, we used multivariate Poisson regression analyses to assess the number of readmissions for HF between the robust, improved, and non-improved groups. Moreover, as a subgroup analysis, the same Cox proportional hazards analysis was evaluated by categorizing patients with HF with reduced ejection fraction (HFpEF) and preserved ejection fraction (HFrEF).

Results: Of the 647 patients, 381 (58.9%) were in the robust group, 103 (15.9%) were in the improved group, and 163 (25.2%) were in the non-improved group. In multivariate Cox proportional hazard analyses, the non-improved group had significantly higher mortality compared to the robust group [adjusted hazard ratio (HR): 2.71, 95% confidence interval (CI): 1.58–4.66] after adjusting for severity of HF (Figure 1-A). In addition, both HFrEF and HFpEF groups had significantly higher mortality in the non-improved group compared to the robust group (HFrEF; HR: 2.41, 95% CI: 1.22–4.76, HFpEF; HR: 2.86, 95% CI: 1.01–8.09) (Figure 1-B and 1-C, respectively). In multivariate Poisson regression analyses, the non-improved group had a high incidence of readmissions for HF compared to the robust group (adjusted incident rate ratio: 1.56, 95% CI: 1.20–2.02) (Figure 2).

Conclusions: A lack of improvement in sarcopenia after CR in patients with HF has affected the life expectancy and the number of readmissions for HF.

![Figure 1: Survival curves of the association between improved or not improved sarcopenia and all-cause death in the left ventricular ejection fraction (LVEF) subgroup. HFrEF, heart failure with reduced left ventricular fraction; HFpEF, heart failure with preserved left ventricular fraction.](https://academic.oup.com/eurheartj/article/43/Supplement_2/ehac544/2761)