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Low energy intake predicts readmission of elderly heart failure patients independently of nutritional status

K. Shimomura[1], S. Katano[1], T. Yano[2], K. Ohori[3], S. Honma[1], A. Watanabe[4], T. Ishigo[5], T. Fujito[2], N. Nagano[2], M. Koyama[6], H. Kouzu[2], A. Hashimoto[7], T. Miura[2]

[1]Sapporo Medical University Hospital, Division of Rehabilitation, Sapporo, Japan; [2]Sapporo Medical University School of Medicine, Department of Cardiovascular, Renal and Metabolic Medicine, Sapporo, Japan; [3]Hokkaido Cardiovascular Hospital, Department of Cardiology, Sapporo, Japan; [4]Sapporo Medical University Hospital, Division of Nursing, Sapporo, Japan; [5]Sapporo Medical University Hospital, Department of Hospital Pharmacy, Sapporo, Japan; [6]Sapporo Medical University School of Medicine, Department of Public Health, Sapporo, Japan; [7]Sapporo Medical University School of Medicine, Division of Health Care Administration and Management, Sapporo, Japan

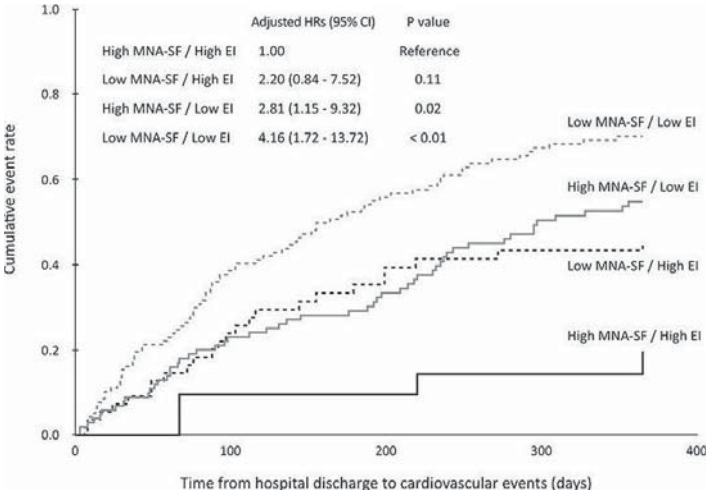
Background: Malnutrition is frequently present and closely associated with poor clinical outcomes in elderly heart failure (HF) patients. Our previous study showed that low energy intake (EI) is associated with worse functional status in elderly HF inpatients after cardiac rehabilitation, but significance of EI in prediction of hospital readmission has not been elucidated fully.

Purpose: We examined whether low EI is a predictor of readmission for cardiac events in elderly HF patients.

Methods: We retrospectively retrieved data for 298 HF patients aged ≥65 years (median age of 77 years, interquartile range [IQR]: 71 - 82, female: 53%) who admitted to our institute for diagnosis and treatment of HF. Medical records were reviewed with regard to demography, medical history, comorbidities, medications, laboratory data, echocardiograms, functional status, nutritional status and total energy intake. Nutritional status was assessed using the Mini Nutritional Assessment Short Form (MNA-SF) and total EI per day were calculated at discharge by a registered dietitian and a trained physical therapist. The primary endpoint was readmission due to cardiovascular events including worsening HF, arrhythmia, angina pectoris and myocardial infarction during a 1-year follow-up period.

Results: The median period of follow-up was 235 days (IQR: 78–365 days). The 1-year readmission rate for cardiovascular events was 54.4%. The cutoff values of MNA-SF score and EI, calculated by ROC curve analysis to predict the primary endpoint, were 7 points (area under the curve [AUC]: 0.59, sensitivity: 0.65, specificity: 0.50) and 31.8 kcal/kg/day (AUC: 0.59, sensitivity: 0.83, specificity: 0.35), respectively. Patients with low MNF-SF score (≤7) or low EI (≤31.8 kcal/kg/day) had significantly higher readmission rate during a 1-year follow-up period than did the patients with high MNF-SF score or EI (MNA-SF: 60.7% vs. 45.6%, $p<0.01$, EI: 60.4% vs. 36.8%, $p<0.01$), respectively. When patients were classified into four groups using cutoff values of MNA-SF score and EI, 1-year readmission rate was significantly higher in patients with low EI than in those with high EI regardless of MNF-SF scores. In multivariate Cox proportional hazard analyses adjusted for known prognostic factors in addition to age and gender, hazard ratios (HR) were significantly higher in patients with high MNA-SF score and low EI (adjusted HR: 2.81, 95% confidential interval [CI]: 1.15 - 9.32, p=0.02) and low MNA-SF score (≤7) and low EI (adjusted HR: 4.16, 95% CI: 1.72 - 13.72, $p<0.01$) than those with high MNA-SF score and high EI.

Conclusions: Low energy intake is a nutritional status-independent predictor of 1-year readmission rate in elderly HF patients.



Kaplan-Meier curves of readmission rates