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CLINICAL RESEARCH

Self-Care and All-Cause Mortality in Patients With Chronic Heart Failure

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ABSTRACT

OBJECTIVES This study examined the association of self-care with all-cause mortality in a cohort of patients with chronic heart failure (HF).

BACKGROUND Although self-care is crucial to maintain health in patients with chronic HF, studies examining an association with clinical outcomes are scarce.

METHODS Consecutive patients with chronic HF (n = 559, mean age 66.3 ± 9.5 years, 78% men) completed the 9-item European Heart Failure Self-care Behaviour scale. Our endpoint was all-cause mortality. Associations between self-care and all-cause mortality were assessed with Kaplan-Meier analyses and multivariable Cox regression accounting for standard sociodemographic and clinical covariates, psychological distress, and self-rated health.

RESULTS After a median follow-up of 5.5 ± 2.4 years (range 16 weeks to 9.9 years), 221 deaths (40%) from any cause were recorded. There was no evidence of a mortality benefit in patients high over those low in global self-care (p = 0.71). In post hoc analyses, low self-reported sodium intake was associated with increased mortality (adjusted hazard ratio: 1.47; 95% confidence interval: 1.10 to 1.96; p = 0.01). Other significant predictors of mortality were: male sex, lack of a partner, New York Heart Association functional class III to IV, and increasing comorbid conditions.

CONCLUSIONS Global self-care was not associated with long-term mortality whereas low self-reported sodium intake independently predicted increased all-cause mortality beyond parameters of disease severity. Replication of findings is needed as well as studies examining the correspondence of subjectively and objectively measured sodium intake and its effects on long-term prognosis in patients with chronic HF. (J Am Coll Cardiol HF 2016;4:176–83)

Chronic heart failure (HF) is a leading cause of (re-)hospitalization and death (1), and a significant clinical and economic burden for health care systems of developed countries (2). Besides established risk factors, poor HF outcomes have been attributed to poor HF self-care (3). Self-care refers to the complex regimen patients with chronic HF are instructed to undertake to maintain their health, for example, sodium and fluid restriction, weight monitoring, and medication adherence. Although it is assumed that self-care is associated with improved outcomes, the available evidence is less clear.

Preliminary findings suggest a potentially beneficial relationship between self-care and event-free survival that is predominantly due to fewer hospitalizations (4,5). Methodological limitations leave uncertainties about a relationship with mortality rates. Previous studies comprised mostly small samples and were limited in follow-up period (<2 years).

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Studies that focused on distinct self-care behaviors showed that medication nonadherence was associated with increased risk for adverse cardiac events in patients with HF (6), whereas low sodium intake was associated with increased event-free survival (i.e., hospitalization or death) (7). Until now, HF-targeted disease management programs that emphasize self-care have repeatedly been associated with decreased hospital readmission, but evidence on mortality rates is lacking (8).

Given the dearth of evidence in terms of long-term mortality, this study examines the association of self-reported self-care with all-cause mortality in a cohort of patients with chronic HF. This study hypothesized that self-care was associated with a greater benefit in long-term prognosis. Post hoc analyses were performed to examine the association of each individual self-care behavior (e.g., low sodium intake) with mortality.

METHODS

PARTICIPANTS AND PROCEDURE. Eligibility requirements and inclusion procedures have been described previously (9,10). Between 2003 and 2008, patients with chronic HF were consecutively recruited from three cardiology outpatient clinics from hospitals in the Netherlands. Inclusion criteria comprised a diagnosis of chronic systolic HF, left ventricular ejection fraction (LVEF) ≤40%, age ≤80 years, stable on oral HF medication for ≥1 month, and absence of a myocardial infarction (MI) or hospital admission in the month before inclusion. Patients were treated optimally according to prevailing HF guidelines (11). Patients were excluded in the case of other life-threatening comorbidities with a life expectancy <1 year, psychiatric comorbidity except for mood disorders, severe cognitive impairment (e.g., documented dementia or Alzheimer's, extracted from medical records), or insufficient Dutch linguistic competence.

In total, 709 eligible patients were approached for participation by their treating cardiologist or nurse during their outpatient visit to the cardiology department. If willing to participate, patients were called within 2 weeks by an independent investigator to schedule a study appointment in which additional verbal and written information about the study was provided. Patients signed informed consent before participation. To guarantee anonymity, study numbers were assigned to each participant that were only available for members of the research team. Patients completed a questionnaire at home to assess socio-demographic, psychological variables, and HF self-care that was returned in a stamped and pre-addressed envelope. We checked for missing items accordingly and patients were contacted when a questionnaire was not returned within 2 weeks or in case of missing items. Our final sample consisted of 559 patients (response rate = 79%).

This is a secondary analysis of data originated from two observational prospective studies (9,10) for which ethics approval was obtained from the medical ethics committees of all hospitals. The investigation conforms the principles outlined in the Declaration of Helsinki (2013).

ABBREVIATIONS AND ACRONYMS

CCI = Charlson comorbidity index

EHFScB = European Heart Failure Self-care Behaviour scale

HF = heart failure

LVEF = left ventricular ejection fraction

NYHA = New York Heart Association

SELF-CARE. HF self-care was assessed using the 9-item version of the European Heart Failure Self-care Behaviour (EHFScB-9) scale (**Figure 1**) (12,13). Items were rated on a 5-point Likert scale ranging from 1 (*I completely agree*) to 5 (*I do not agree at all*). Scores ranged from 9 to 45 with higher scores reflecting worse self-care. The total scale consists of a 4-item consulting behavior subscale (10,12) that assesses whether patients contact their physician when HF-specific symptoms (e.g., shortness of breath, weight, fatigue) increase. Psychometric properties of the EHFScB-9 have been shown reliable for the total scale and consultation behavior subscale previously (14). Cronbach's α was 0.80 for the total scale, indicating good internal consistency in this dataset.

Median split was used to distinguish between patients high versus low in global self-care because no validated cut-off score is available for the EHFScB-9. Scores of ≥21 and ≥9 were used to define low (i.e., worse) global self-care and consulting behavior, respectively. Low performance of each separate self-care behavior was categorized with a score of ≥3. A sensitivity analysis was performed with a standardized cut-off score of ≥70 indicating better self-care, which corresponds with the recommended cut-off point for the other well-known self-care measures (i.e., the Self-Care Heart Failure Index scale) (15).

COVARIATES. We used purpose-designed items in the questionnaires to assess socio-demographic variables including educational level, current smoking status, partner status, and employment status. From patients' medical records, information was obtained on age, sex, disease characteristics (i.e., etiology, LVEF, New York Heart Association (NYHA) functional class I to II vs. III to IV), cardiac history (i.e., previous MI, percutaneous coronary intervention, or coronary artery bypass graft surgery), serum sodium, and pharmaceutical treatment (e.g., beta-blockers, angiotensin-converting enzyme inhibitors, diuretic agents, psychotropic medication). Body mass index