Research Letter

Older Patients With Acute Decompensated Heart Failure Who Live Alone: An Analysis From the REHAB-HF Trial

Social isolation has greatly worsened owing to the COVID-19 pandemic and patients with heart failure (HF) who live alone experience poorer outcomes such as hospital readmission.[1] However, drivers of poor outcomes in these patients and estimates about their physical and quality of life (QOL) impairments remain unknown. We sought to assess the prevalence of patients with acute decompensated HF (ADHF) enrolled in the REHAB-HF trial living alone, and hypothesized that these patients would have worse physical function, QOL, cognition, and depression, than patients living with someone else.

Methods

We assessed patients enrolled in the REHAB-HF Trial. Patients were 60 years or older with preserved or reduced ejection fraction hospitalized with ADHF.[2] Additional inclusion criteria included independence with activities of daily living, attainment of clinical stability, ability to walk 4 or more meters with or without a device, planned home discharge, and sufficient support to comply with postdischarge exercise intervention. Patients provided written informed consent and the institutional review boards of the participating sites approved the study.

Physical function measures included the short physical performance battery, normal gait speed, 6-minute walk distance, handgrip strength, and frailty (Fried criteria). QOL was assessed using the Kansas City Cardiomyopathy Questionnaire, the Short Form-12, and EuroQol-5D-5L. Depression was assessed using the Geriatric Depression Scale. Cognitive function was assessed using the Montreal Cognitive Assessment.

Patients were categorized by patient self-reported data into those living alone vs those living with someone. Categorical variables were analyzed as frequencies (percentages) using the χ^2 test. Continuous variables were compared by t test and presented as mean $\pm$ standard deviation. Outcomes were analyzed using analysis of covariance, adjusting for sex.

Results

Of 202 patients, 67 (33.2%) lived alone. Of those who lived with someone, 56.3% lived with their spouse. Patients who lived alone had a mean age of 72.4 $\pm$ 7.8 years, 64% of whom were female, 52% were non-White and had a mean of 6.1 $\pm$ 5.5 comorbidities (Table 1). Patients living alone were more likely to be female, have higher N-terminal pro B-type natriuretic peptides, and more prevalent chronic kidney disease.

Patients living alone had severe impairments in physical function and QOL and more than one-half met the criteria for frailty (56%). Depression was very common in both groups. Cognitive dysfunction was present in 81% of those living alone. However, no differences in physical function, depression, cognitive dysfunction, or QOL were noted between patients who lived alone or those who lived with someone else after adjusting for sex.

Patients who lived with a spouse, compared with those who lived with someone else, were more likely to be male (68% vs 29%), White (63% vs 29%), and have a high school education or greater (91% vs 39%) (all $P <$ .05). No differences in physical function or other clinical parameters were noted between patients who lived with their spouse compared with those who lived with someone other than their spouse.

Discussion

Our results show that, among a diverse population of older hospitalized patients with ADHF, one-third live by themselves. These patients, mostly women, had significant impairments in physical function, QOL, mood, and cognition, similar to patients living with others with more additional social support. These patients, therefore, represent a large proportion of patients with ADHF at high risk for adverse outcomes.

The prevalence of those living alone was higher in our population (33%) than the general older population (26%).[3] Consistent with the age of this population, women were much more likely to live alone than men.[3,4] Social isolation, recognized as a major risk factor for readmission, may contribute to women with HF being at greater risk than men for hospital readmission.[5] The high prevalence of women living

Table 1. Characteristics of Older, Hospitalized Patients With Aucte Decompensated Heart Failure Who Live Alone vs Those Not Living Alone

Characteristics	Living Alone (n = 67)	Not Living Alone (n = 135)	P Value
Age (years)	72.4 ± 7.8	71.9 ± 7.4	.63
Women	43 (64%)	66 (49%)	.040
Non-White	35 (52%)	65 (48%)	.96
Less than high school education	12 (18%)	25 (19%)	.92
Body mass index (kg/m^2)	34.0 ± 9.0	32.8 ± 8.8	.36
Ejection fraction of ≥45%	30 (45%)	66 (49%)	.58
Duration of index hospitalization	5 (3−6)	5 (3−7)	.23
Patients w/hospitalizations within 6 months	26 (39%)	63 (47%)	.29
Patients w/HF hospitalizations within 6 months	17 (25%)	38 (28%)	.68
B-type natriuretic peptide (pg/mL) (n = 117)	1084 ± 1066	850 ± 901	.37
N-terminal brain natriuretic peptide (n = 77)	3595 ± 3474	7324 ± 12,186	.041
Comorbidities			
Diabetes mellitus	36 (54%)	75 (56%)	.81
Hypertension	59 (88%)	128 (95%)	.09
Hyperlipidemia	45 (67%)	95 (70%)	.64
Atrial Fibrillation	31 (46%)	62 (46%)	.96
Previous myocardial infarction	14 (21%)	26 (19%)	.78
Chronic obstructive pulmonary disease	19 (28%)	46 (34%)	.41
Chronic kidney disease	13 (19%)	54 (40%)	.003
Stroke	13 (19%)	19 (14%)	.33
Arthritis/connective tissue disease	37 (55%)	57 (42%)	.08
Cancer	17 (25%)	25 (19%)	.26
Depression	11 (16%)	22 (16%)	.98
Anemia (Hgb <13 for men, <12 for women)	46 (69%)	98 (73%)	.56
Peripheral vascular disease	12 (18%)	14 (10%)	.13
Peptic ulcer disease	2 (3%)	7 (5%)	.48
Dementia	2 (3%)	2 (1%)	.47
Obstructive sleep apnea	19 (28%)	42 (31%)	.69
AIDS/HIV	1 (2%)	1 (1%)	.61
Total No. of comorbidities	6.1 ± 5.5	6.2 ± 2.0	.62
Medication use			
Loop diuretics	64 (96%)	124 (93%)	.42
Beta blockers	60 (90%)	108 (81%)	.11
Angiotensin-converting enzymes inhibitors	35 (52%)	49 (37%)	.034
Angiotensin receptor blockers	13 (19%)	31 (23%)	.55
Calcium channel blockers	14 (21%)	46 (34%)	.050
Aldosterone agonist	15 (22%)	21 (16%)	.24
Physical function and QOL parameters			
Frailty	37 (56%)	64 (49%)	.32
KCCQ overall score	42 ± 3	40 ± 2	.45
Short Form-12 Physical Composite score	28 ± 1	28 ± 1	.85
Short Form-12 Mental Composite score	45 ± 2	43 ± 1	.37
Geriatric depression scale score	4.9 ± 0.4	4.9 ± 0.3	.99
Geriatric depression scale score ≥5	32 (48%)	61 (45%)	.73
Montreal Cognitive Assessment score	21.7 ± 0.6	21.7 0.4	.99
Montreal Cognitive Assessment score <26	54 (81%)	135 (77%)	.56
EQ-5D-5L components			
Walking	2.6 ± 0.1	2.4 ± 0.1	.27
Self-care	1.8 ± 0.1	1.7 ± 0.1	.32
Usual activities	2.6 ± 0.1	2.7 ± 0.1	.94
Pain/discomfort	2.5 ± 0.1	2.4 ± 0.1	.54
Depression/anxiety	1.8 ± 0.1	1.8 ± 0.1	.91
Health thermometer	59 ± 3	57 ± 2	.51

Abbreviations: HF, heart failure; Hgb, hemoglobin; KCCQ, Kansas City Cardiomyopathy Questionnaire; EQ-5D-5L, EuroQol questionnaire; QOL, quality of life.

Values shown as number (%), median (interquartile range), or mean ± standard error. Outcomes adjusted for sex. Depression is defined as geriatric depression scale score of ≥5. Cognitive impairment is defined as Montreal Cognitive Assessment Score <26.

alone may need to be taken into account when designing postdischarge programs and strategies for patients with ADHF, particularly accounting for variable support that patients might have.

These findings are novel because, to our knowledge, living situation has not been reported for any HF population, let alone for older patients with ADHF. ADHF is the most common Medicare hospital discharge diagnosis, highlighting the potential impact of our findings. These data were collected before the COVID-19 pandemic, which likely magnified the adverse consequences of living alone.

Limitations included our small sample size and that this was not a prespecified analysis. Furthermore, our results could be an underestimate of patients with ADHF living alone, because we excluded patients discharged to facilities.

The high prevalence of patients with ADHF living alone suggests that treatment strategies that leverage social supports, such as caregivers, may have to be tailored based on patients' living situation. Mechanisms to better support patients with ADHF living alone should be developed, tested, and implemented.

Disclosures

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