



Variable Contribution of Heart Failure to Quality of Life in Ambulatory Heart Failure With Reduced, Better, or Preserved Ejection Fraction

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ABSTRACT

OBJECTIVES The relative contribution of heart failure (HF) compared with other medical and nonmedical factors on diminished quality of life (QOL) across subtypes with reduced, better, and preserved left ventricular ejection fraction (LVEF) in a large ambulatory HF population was evaluated.

BACKGROUND Dominant factors influencing limited QOL in patients with HF have not been investigated.

METHODS Before routine HF clinic visits, 726 patients with ambulatory HF (mean age 56 ± 15 years, 37% women) completed a 1-page questionnaire that assessed QOL and relative contributions of HF compared with other medical and nonmedical factors to their QOL limitations. Visual analogue scales were used to assess overall QOL, breathing, and energy level. Results were compared across reduced (57%), preserved (16%) and better (improvement in LVEF $\geq 50\%$) (19%) subtypes.

RESULTS Just under one-half of patients (48%) rated QOL as limited dominantly by HF, 19% rated HF and medical problems as equally limiting, 18% cited medical problems as dominant, and 15% cited nonmedical factors. Patients with HF with better LVEF had the highest overall QOL score and less dyspnea burden than those with HF with preserved EF. Independent correlates of HF-dominated diminished QOL were prior cardiac surgery, worse New York Heart Association functional class, renin-angiotensin-aldosterone antagonism, use of diuretic agents, lower body mass index, lower LVEF, and lack of arthritis or history of cancer.

CONCLUSIONS Fewer than one-half of patients with ambulatory HF rated HF as the greatest limitation to their QOL, suggesting that this important outcome will be difficult to affect by HF-targeted therapies alone, particularly in those with higher LVEFs and comorbidities. Patients with HF with better LVEF represent a distinct subtype with better overall QOL. (J Am Coll Cardiol HF 2016;4:184-93) © 2016 by the American College of Cardiology Foundation.

The increasing prevalence and evolving profile of chronic heart failure (HF) have increased awareness of the importance of incorporating patient-centered outcomes, including quality of life (QOL), in routine ambulatory care (1). Patients with HF and related conditions predisposing to HF, including myocardial infarction, diabetes, and obesity, are living longer in the setting of more

advanced therapies and interventions and frequently rate improved QOL as more important than longer survival (2). HF has a significant negative impact on all aspects of health-related QOL, particularly those related to physical functioning, mental health, and social domains (3-5). Even compared with other serious cardiac or noncardiac chronic conditions, impairment in QOL is greatest in patients with HF,

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determined largely by New York Heart Association (NYHA) functional class (5,6). Reduced QOL has been consistently associated with worse prognosis in patients with HF, predictive of both rehospitalization and mortality (7-10).

Although many current HF therapies have had a positive impact on QOL, major limitations in QOL often persist in patients with HF (11). The degree of QOL limitation has been shown to be similar across HF populations with preserved or reduced left ventricular ejection fraction (LVEF) (4,12). However, in the contemporary complex and aging HF population, with patients often carrying significant burdens of associated cardiac and noncardiac comorbid conditions (13,14), multiple factors beyond HF may influence patients' perceptions of their QOL. Despite this, little is known about the relative contributions of other medical comorbidities and even nonmedical factors on QOL impairment in patients with HF. Meanwhile, the success of current medical and device therapies has created a new HF population distinct from those with HF with reduced LVEF (HFrEF) and HF with preserved LVEF (HFpEF), composed of patients with previously reduced but now improved LVEFs to $\geq 50\%$, or HF with better LVEF (HFbetterEF) (15,16). Although frequently misclassified as having HFpEF, these patients are both clinically and biochemically distinct, with a lower comorbidity profile, milder HF symptom burden, and lower event rate than patients with either HFpEF or HFrEF (15,16).

We hypothesized that given the heterogeneity in functional status across HF subtypes, heterogeneity may also arise in patients' perceived dominant limitations to their QOL; patients with HF may be equally or predominantly limited in their QOL by superimposed disease or even independent factors. Accordingly, the principal aim of the present study was to determine the contribution of HF compared with medical and nonmedical factors to patients' perceived dominant limitations to their overall health-related QOL and its clinical correlates in a large, ambulatory HF population including patients with HFrEF, those with HFpEF, and those with HFbetterEF. Second, patient-perceived severity of dyspnea and fatigue and overall QOL rating were investigated within these HF-dominant or not QOL subgroups and additionally according to distinct LVEF HF subtype.

METHODS

PATIENT POPULATION AND PROTOCOL. All patients seen in the ambulatory HF clinic at Brigham and Women's Hospital were encouraged to complete a questionnaire assessing their QOL as part of a quality

improvement intervention. Participants were given a self-administered 1-page questionnaire (Online Appendix) prior to the visit that assessed their overall QOL, functional status, and degree to which their HF, as well as other conditions, affected their QOL. Data provided by the questionnaire were then used by clinicians to facilitate the clinic encounter. Patients younger than 18 years of age, recipients of ventricular assist devices, those with non-HF-related terminal conditions such as stage IV cancer, and those returning incomplete questionnaires were excluded from the present analysis.

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Retrospective chart review was performed to collect patient demographics and clinical characteristics, including HF etiology and medical comorbidities. HFpEF was defined as LVEF $\geq 50\%$ in the absence of a history of left ventricular (LV) systolic dysfunction or dilated cardiomyopathy. HFrEF was defined as persistent LVEF $< 50\%$ in association with an ischemic or nonischemic cardiomyopathy. HFbetterEF defined those patients who had prior echocardiographic evidence of HFrEF but whose LVEFs subsequently improved to $\geq 50\%$ by the time of the study clinic visit (15). In addition, symptom profile, including NYHA functional class, current medications, and the presence or absence of HF signs on clinical examination on the day of the clinic visit, were noted. Body mass index (BMI) was calculated on the basis of height and weight measurements recorded on the day of the outpatient visit. The results of transthoracic echocardiography within 18 months of the index appointment were also reviewed. LVEF and other standard echocardiographic measurements were performed according to current guidelines applied uniformly by the noninvasive echocardiography laboratory at Brigham and Women's Hospital (17-19).

The Institutional Review Board of Brigham and Women's Hospital approved this retrospective, cross-sectional observational study.

QUESTIONNAIRE DESIGN AND QOL ASSESSMENT.

Questionnaires were designed to focus on 3 key areas: 1) overall QOL; 2) symptom burden due to shortness of breath and fatigue; and 3) patients' perceived dominant overall limitations to their QOL status. Separate vertical visual analogue scales (VAS) were used to assess overall QOL, ease of breathing, and

ABBREVIATIONS AND ACRONYMS

- BMI** = body mass index
- CI** = confidence interval
- HF** = heart failure
- HFbetterEF** = heart failure with better left ventricular ejection fraction
- HF=Med** = patients' perceived quality of life limited equally by heart failure and medical conditions
- HFMed** = patients' perceived quality of life limited predominantly by their heart failure
- HFpEF** = heart failure with preserved left ventricular ejection fraction
- HFrEF** = heart failure with reduced left ventricular ejection fraction
- LV** = left ventricular
- LVEF** = left ventricular ejection fraction
- MedMost** = patients' perceived quality of life limited predominantly by their medical conditions
- Non-Med** = patients' perceived quality of life limited predominantly by nonmedical factors
- NYHA** = New York Heart Association
- OR** = odds ratio
- QOL** = quality of life
- VAS** = visual analogue scale

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