

## EDITORIAL COMMENT

# Are Hospitalizations for Heart Failure the Great Equalizer?\*



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In 1964, Stein et al. (1) reported a case series of 23 boys and girls in Baragwanath Hospital in Johannesburg, South Africa, with relative homogenous clinical presentation with low-output heart failure (HF) and high mortality with pathology revealing endocardial fibroelastosis as the likely cause of many sporadic cases of cryptogenic HF. Over the subsequent 5 decades, differences and disparities in HF provide an opportunity to reflect on biological differences, clustering of risk factors, patient behaviors and preferences, and nonphysiological variables (2). It has been well established that black patients with HF represent a unique group in the United States (3): they are often younger and have more hypertension and less coronary artery disease, and a higher proportion are women. Epidemiological cohorts demonstrate higher incidence and prevalence rates of HF among blacks (4). Although mortality in ambulatory HF patients is higher among blacks (5), hospitalized patients are consistently different.

It has been argued that acute decompensated heart failure (ADHF) is a distinctly different entity than chronic HF (6), and the hallmark of this event often results in hospitalization, usually associated with consistently increased risk of mortality (7). Nevertheless, black patients hospitalized consistently have similar to better outcomes than white patients, suggesting that the hospital stay may be the “great equalizer” when it comes to racial differences in HF. In the OPTIMIZE-HF (Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients With

Heart Failure) registry (8), black patients’ outcomes compared favorably to those of non black patients with comparable guideline-based therapies and had lower in-hospital and post-discharge mortality. The Get with the Guidelines experience demonstrated that use of guideline-based therapies in the treatment of black patients produced similar or better outcomes than those in white patients and that in-hospital mortality was 31% lower (9). Explanations for the stark contrast in quality of care in the hospitalized versus nonhospitalized black HF patient include access to care, preference for follow-up, noncompliance, affordability of medicines, and other societal influences. Thus, understanding how in-hospital processes can be applied to ambulatory management may mitigate some of these differences.

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The study by Qian et al. (10), in this issue of *JACC: Heart Failure*, evaluated the Tele-HF (Telemonitoring to Improve HF Outcomes) trial population to compare health status and health-related quality of life (HRQL), all-cause readmissions, and mortality through 180 days post-discharge between self-described black and white patients who were recently discharged for ADHF. Using the increasingly popular generalized linear mixed modeling approach, the authors were able to adjust for clustering of risk factors and other important differences between the patients over time, with the multivariate models further strengthened by propensity matching. HRQL was measured using the Kansas City Cardiomyopathy questionnaire (KCCQ) survey of patients shortly after their discharge from the hospital; for some, the hospital stay had lasted up to 30 days, and their responses served as the baseline value. The KCCQ survey was repeated at 3 and 6 months for longitudinal assessment. One of the key findings of the study

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was that black patients had a better, fully adjusted HRQL assessment at baseline than white patients with a clinically meaningful difference in score of 6.22. However, the unadjusted mean baseline KCCQ scores between black and white patients were similar ( $60 \pm 25$  vs.  $59 \pm 2$ , respectively;  $p = 0.69$ ), and this finding tempers enthusiasm for the conclusions drawn. Partially adjusted difference was 3.97 points after “accounting for clustering within sites and correlation among repeated measurements” (10). Figure 1 in the study by Qian et al. (10) nicely depicts the trend in fully adjusted KCCQ scores, suggesting that black patients did not note a dramatic increase in KCCQ scores over 6 months in comparison to white patients, who had a steeper slope between baseline and 3 months, resulting in no significant between-group differences in HRQL at both 3 and 6 months. Several adjusted KCCQ domain scores suggested better health status among black patients than white patients, including physical limitations, symptom frequency, symptom burden, social limitation, and quality of life. None of the domains was different between groups during follow-up.

This study suggests that black patients who are discharged after ADHF have a better overall HRQL than white patients. One potential explanation for this trend could be differential time frame since discharge between black and white patients. The KCCQ has a 2-week time horizon, and patients must integrate how their HF has influenced their health status over that time period. Thus, enrolled patients who were discharged within 10 days might have had a worse perception of their HRQL than those who were further out. This is supported by a recent publication that demonstrated a gradual improvement in health status after a nonfatal event (11). The baseline KCCQ score could also be ascertained up to 2 weeks after enrollment in the TELE-HF trial. Thus, the KCCQ results could technically be assessed between 1 day postdischarge and as much as 44 days postdischarge. Although randomization would balance these differences, there might have been racial variations in the enrollment time. Moreover, the hazard for readmission decreases as individuals get further from hospital stay, and thus, patients who completed the KCCQ between 15 and 30 days earlier may reflect a healthier cohort. Adjustment for number of days post-discharge may negate some patient-level differences. Another explanation could be that the threshold for HF hospitalizations may be different between blacks and whites in the United States. Nevertheless, this study adds to the growing body of published reports regarding HRQL in black patients with HF (12,13).

An equally compelling finding is that the 30- and 180-day unadjusted and adjusted readmission rates were similar between black and white patients. This finding is the opposite of those from some studies that suggest that black patients are at higher risk for 30-day readmissions, an issue that often penalizes hospitals that have a cluster of these patients, often with many of the limitations detailed and adjusted for by the authors. Telemonitoring did not influence individual outcomes in the parent trial and did not provide benefit among black or white patients as a group (14). However, the selected patient population post-ADHF and the attention provided within the construct of a clinical trial might have influenced these overall rates in comparison to the general population. Although there were no differences in 30-day mortality rates between patient groups, the 180-day mortality rate was higher among white patients at 13.4% than in black patients at 9.0% ( $p = 0.01$ ). This difference in mortality was not significant in the fully adjusted model. This differential mortality may have influenced readmission rates by 180 days due to competing risks. These data support the growing number of studies suggesting that both in-hospital mortality and short-term post-discharge mortality are better or the same among black patients with ADHF in comparison to white patients (15).

Where do we go from here? Comparative effectiveness research should be performed to identify cost-effective strategies to reduce the initial hospitalization for HF and to optimize patient care with particular attention to ethnic minorities and those with lower socioeconomic status. Patient advocates and navigators may enable vulnerable patients with HF to maximize self-efficacy, symptom recognition, HRQL, and survival. Routine collection of patient-level behavioral characteristics for every hospitalization for decompensated HF may allow for better risk prediction post-discharge. Extending our understanding of the interplay among in-hospital treatments such as reasons for admission, length of stay, adequacy of diuresis, and adequacy of transitions and education with subsequent HRQL will be helpful as we try to improve these post-discharge outcomes. If post-discharge HRQL is independently predictive of subsequent mortality and readmissions, then routine assessment of HRQL should be performed in all patients during their early post-discharge clinic visits. Patient’s baseline frailty may influence the magnitude of improvements in their HRQL post-discharge. Finally, assessment of patients’ HRQL using validated instruments on admission may supplement existing measurements that measure dyspnea, which are not

as discriminatory and may not have long-term relevance post-discharge.

The authors should be applauded for attempting to look at three key targets of therapy in the recently discharged HF patient: mortality, rehospitalizations, and HRQL. Although there are inherent limitations to the study, it sheds light on the racial differences (and similarities) post-discharge. By improving our understanding as to why there is a tendency for better

outcomes during a hospital stay and immediately afterward, we can apply the lessons learned to the larger cohort of black patients living and suffering with HF who do not require hospitalization.

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