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Racial Differences in Treatment-Seeking Delays Among Heart Failure Patients

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ABSTRACT

Background: Treatment-seeking delays for heart failure (HF) symptoms are significantly high. However, earlier studies did not closely examine race as a characteristic that could potentially influence delay times. The purpose of this study was (1) to describe racial differences in treatment-seeking delays for HF symptoms and (2) to identify racial differences in hospital readmission rates, functional status, and total length of stay.

Methods and Results: A retrospective chart review of all patients admitted with HF at a Veterans Administration facility was conducted. The study sample consisted of 753 patients: 456 Caucasians (60.6%), 220 African Americans (29.2%), 41 Asians (5.4%), and 36 Hispanics (4.8%). The average prehospital delay time was 2.9 ± 0.7 days. Mean delay times were significantly longer for African Americans than for Caucasians, Asians, and Hispanics ($P = .019$). African Americans also had significantly higher readmission rates ($P = .001$) and lower functional status (higher New York Heart Association functional class) ($P = .034$). There were no significant racial differences in total length of stay for HF admissions.

Conclusion: The current study supports that racial differences exist in treatment-seeking behaviors for HF symptoms, hospital readmission rates, and functional status. A better understanding of treatment-seeking behaviors of HF patients with different racial characteristics may be key to early recognition and prevention of complications in this high-risk population; it may be beneficial in identifying patients at risk for treatment delays and potentially poorer outcomes.

Key Words: Veterans, hospital readmission, functional status, total length of stay.

Population-based studies have found that African Americans with heart failure (HF) have higher morbidity and mortality rates than do Caucasians with the same condition.¹ This finding has been attributed to several clearly defined factors including differences in severity, causes, and management of HF; the prevalence of coexisting conditions; and the socioeconomic status of

HF patients.² However, other factors that lead to racial disparities are not as well studied or understood and are only beginning to attract attention from health care workers, researchers, and policy makers.

One area of science that is gaining more recognition in the current healthcare environment is treatment-seeking behaviors of patients. In response to the priorities set forth in Healthy People 2010,³ researchers have sought to determine whether racial disparities exist in treatment-seeking behaviors of patients with chronic and acute symptoms. Consequently, cardiovascular investigators have begun to unravel some of the issues related to racial differences and treatment delays. Recent research suggests that African Americans are less likely than Caucasians to seek and receive appropriate treatment for coronary heart disease⁴⁻⁵ and for stroke.⁶ Although treatment-seeking delays in HF patients have been docu-

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mented in previous studies to be significantly high,⁷⁻⁸ studies that examine racial differences in treatment-seeking delays in this patient population are limited. Furthermore, in the few studies that examined the potential impact of racial differences on patient outcomes in cardiac patients, the number of African Americans has been too small to predict any differences.⁹

This current investigation was conducted to assess racial differences in treatment-seeking behaviors of HF patients. Additional aims of the study were to describe racial differences in hospital readmission rates, functional status (New York Heart Association [NYHA] functional class), and total length of stay of HF patients. A better understanding of treatment-seeking behaviors of HF patients with different racial characteristics may be key to early recognition and prevention of complications in this high-risk population; it may be beneficial in identifying patients at risk for treatment delays and potentially poorer outcomes.

Methods

Study Subjects and Data Source

The investigators for the current study conducted an analysis of chart-review data using the Patient Treatment Files (a national administrative database containing all Veterans Administration [VA] hospitalizations). All patients discharged with a primary diagnosis of HF (International Classification of Disease ICD-9 codes 428.0, 428.1, and 428.9) from a VA Medical Center between January 1997 and December 1998 were considered for the study. We initially screened 795 records and excluded medical records from further analysis if the primary reason for admission was noncardiac (eg, management of diabetes, fracture); 753 were retained for inclusion in the current study.¹⁰

The independent variable of interest for the study was race. Racial identification was determined at entry into the VA system. Patients were asked to self-identify what category of race best described them. Race was recorded as Caucasian, African American, Asian, or Hispanic. A label for racial categories other than the four that were identified in the collection tool was available, but none of the patients fell into another category. The primary dependent variable for the current study was treatment-seeking delays, which were defined as the amount of time between the patient's awareness of symptoms and arrival at the hospital.⁸ Given the chronic nature of HF and often ongoing presence of symptoms, treatment-seeking delays were defined for purposes of the current study as the time when HF symptoms began to worsen. Treatment delays were ascertained using the information provided by the admitting physician when patients pre-

sented to the hospital for worsening of HF symptoms. This information is a required field for completing the computerized admission profile. The computerized admission profile has been standardized and requires health care professionals to obtain uniform data on all patients admitted within the VA system. The final draft of the admission profile can only be submitted and made an official document when the admitting physician has entered all the required fields. This prompts physicians to ask for relevant information pertaining to onset of worsening of HF symptoms.

Additional data were also collected and recorded from the Patient Treatment Files, including (1) number of HF readmissions (hospitalizations after index admission for HF symptoms during the study time frame of 24 months); (2) functional status (measured as the practitioner-reported assessment of NYHA functional class, range 1-4, with higher classification indicating lower functional status); and (3) total length of hospital stay (number of days from admission to discharge for each HF admission).

Statistical Analysis

Data were analyzed using SPSS for Windows (version 8.0).¹¹ Descriptive statistics including means, ranges, and standard deviations (SD) were used to describe sociodemographic characteristics and treatment delay times, number of hospitalizations, functional status, and total length of hospital stay. Racial comparisons of the categorical variables were performed using the chi-square test of association. Independent *t*-tests (for bivariate analysis) were used to compare between group differences for continuous variables. To further assess the effect of race on delay times, multiple linear regression with stepwise entry was used. Demographic variables (age and marital status) and clinical variables (NYHA class) were entered in blocks, followed by race. Default entry (.05) and removal (.10) criteria were used. Significance was set at an $\alpha < 0.05$ for all analyses.

Results

The study sample consisted of 753 patients: 456 Caucasians (60.6%), 220 African Americans (29.2%), 41 Asians (5.4%) and 36 Hispanics (4.8%). The mean age of the sample was 69 years (SD = 11.7, range, 33 to 99). The sample consisted of 98% males. A total of 284 patients (38.0%) were married; the remaining 62.0% were single, widowed, divorced, or separated. Approximately half of the total sample of the patients (51.6%) lived with a significant other. Only a small number of patients (14.5%) still worked; a large number of subjects were retired (73.7%). There were no significant differences in

sociodemographic characteristics between patients in the four racial categories, as summarized in Table 1.

The mean and median delay times were closely similar for the current study (3.0 and 2.9 days, respectively). In contrast to other studies examining delay, we found that mean delay times were normally distributed. Therefore, we did not have to perform logarithmic transformation when analyzing mean delay times. Figure 1 provides a graphic presentation of racial differences for treatment-seeking delays. The mean delay time was significantly longer ($P = .019$) for African Americans (3.2 ± 1.7 days) than for Caucasians, Asians, and Hispanics (2.8 ± 1.6 , 2.9 ± 1.5 , and 2.8 ± 1.7 days, respectively). To consider the effects of race together with age, marital status, and NYHA classification, a multiple linear regression with stepwise entry was used. Because Asians and Hispanics were present in relatively small numbers in our sample and because we sought to determine whether bias against African Americans held in the face of other relevant variables, only Caucasians ($n = 456$) and African Americans ($n = 220$) were included in the multivariate analysis. When age, marital status, and NYHA classification were taken into account, African American race continued to be associated with greater delay time in seeking treatment for HF symptoms (Table 2).

Finally, we found that African Americans also had significantly higher ($P = .001$) hospital readmission rates (1.8 ± 1.4 ; range, 1-8 admissions) and significantly lower ($P = .034$) functional status (reflected as higher NYHA class) (2.0 ± 0.7 ; range, 1-4). There were no significant differences in total hospital length of stay for HF admissions for participants in all four racial groups (Table 3).

Discussion

The current study supports previous research in which African Americans had longer treatment-seeking delays, higher hospital readmission rates, and lower functional status than did Caucasians, Asians, and Hispanics. Although differences in total length of stay were also seen in African Americans, the differences were not signifi-

cant. Philbin and DiSalvo¹² also found racial differences in hospital readmission rates (black-to-white odds ratio = 1.301, $P = .0001$); however, contrary to our findings, these researchers also found race to be an important determinant of length of stay.

Several plausible explanations have been advanced for the observed racial differences in health care utilization and outcomes. First, observed racial differences may be associated with differences in clinical factors related to underlying disease. African Americans have higher prevalence of left ventricular hypertrophy and hypertension and lower ejection fraction¹³ and thus lower functional status. Likewise, differences in causes of HF may partially account for the observed racial variation in admission rates. Philbin and DiSalvo¹² stated that "hypertensive heart disease, which is more common in African Americans, may be a more volume-sensitive state, making those who have it prone to sudden, symptomatic pulmonary congestion and interstitial edema, resulting in recurrent hospitalization."

A second plausible explanation may be the failure of patients to recognize that their signs and symptoms indicate a significant medical problem that requires immediate medical attention.⁴ Conigliaro and colleagues¹⁴ found and reported that "African Americans were less knowledgeable than Caucasians about their heart disease symptoms, suggesting that they may be less aware of heart disease, less alert to changes in their conditions and symptoms and less likely to attribute symptoms to cardiac origins." Furthermore, the slow progression of symptoms may lead to delays among HF patients who are unaware of the symptoms' importance.⁸ It may also be that patients with a known history of HF who have ongoing symptoms may have more difficulty detecting increases in symptoms that merit health care consultation.⁷

The fact that African Americans are less able to identify symptoms that are potential warning signs for coronary heart disease has been explicated as a potential reason for differences in treatment-seeking delays and management of heart disease in African Americans.¹ Raczynski and colleagues¹ have also suggested that "racial background may account for differences in symptom perception and attribution such as physiological

Table 1. Racial Differences in Sociodemographic Characteristics of the Sample ($n = 753$)

	Caucasians ($n = 456$)	African American ($n = 220$)	Asians ($n = 41$)	Hispanics ($n = 36$)
Age (mean \pm SD)	69.8 \pm 11.4	67.8 \pm 12.9	68.9 \pm 12.5	66.7 \pm 11.6
Gender, male (n, %)	449 (98.5%)	219 (99.5%)	40 (97.6%)	36 (100%)
Married (n, %)	173 (37.9%)	82 (37.3%)	14 (34.1%)	15 (41.7%)
Living with someone (n, %)	246 (53.9%)	102 (46.4%)	20 (48.8%)	21 (58.3%)
Employed (n, %)	67 (14.7%)	31 (14.1%)	4 (9.8%)	7 (19.4%)
Retired (n, %)	349 (76.5%)	153 (69.5%)	30 (73.2%)	23 (63.9%)

NS, not significant.

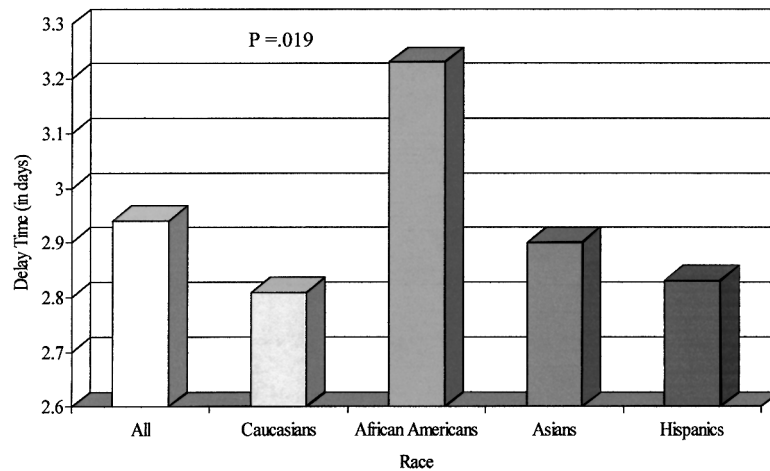


Fig. 1. Racial differences in pre-hospital delay time.

mechanisms that result in lower rates of perceived discomfort or potentially different pain tolerance levels.”

Inadequate access to health care or organizational barriers to seeking care may be a third plausible explanation for racial differences in treatment-seeking behaviors of HF patients. Previous studies have shown that African Americans receive less appropriate management for congestive HF and pneumonia than do Caucasians.³ Previous studies have also shown that African Americans admitted with HF were sicker but used fewer resources than did other patients after researchers adjusted for severity of illness and other factors.¹² However, access to care and socioeconomic factors may not be as applicable to the current sample of veterans given the fact that the VA system has fewer financial barriers to care than the private sector health care system. In particular, an eligible veteran is entitled to seek treatment at a VA hospital for evaluation at a time of his or her own choosing, without any need for precertification, primary care referral, or prepayment.

Compliance with follow-up appointments is another important factor that may explain racial differences in outcomes. During follow-up, African Americans were less likely to keep appointments than Caucasians.^{13,15} Lack of adherence to the prescribed medical regimen and dietary recommendations has also been implicated as a

commonly identified causative factor for hospital readmissions among African Americans and was noted in 65% of the cases of patients who were readmitted for HF decompensation.¹⁶ Unfortunately, we did not collect data on compliance with follow-up appointments and treatment regimens for the current study; therefore, we do not know whether compliance differed between groups.

This study has several important limitations that require that our findings be interpreted cautiously. First, we used a retrospective design. Therefore, we cannot be certain that factors we have not accounted for may have influenced our results, and we are unable to comment on causality. Nonetheless, our approach was warranted because so little was known about treatment-seeking delay in HF and racial differences in HF patients, and the current study provides initial exploratory data in this important field. Second, the data we obtained regarding delay were collected as part of the clinical interview when patients presented to the emergency department and were susceptible to random error. We were forced to rely on the interviewing skills of the health care provider and the patient or family member's memory of symptom onset during an emotional and stressful time in the emergency department. Multiple physicians were involved in the history recording of the subjects. The physicians may have varied in their history-

Table 2. Results of multiple linear regression (n = 676)

	Adjusted R ²	R ² Δ	F	Standardized beta	T	P
Model 1:	.080	.081	59.60			< .001
NYHA				.285	7.72	< .001
Model 2:	.135	.057	44.27			< .001
NYHA				.261	7.25	< .001
Race*				.239	6.65	< .001

NYHA, New York Heart Association.

*Caucasian v. African American

Table 3. Racial Differences in Hospital Readmission Rates, Functional Status and Total Hospital Length of Stay (n = 753)

	Caucasians (n = 456)	African Am. (n = 220)	Asians (n = 41)	Hispanics (n = 36)	P value
Hospital readmission rates (mean \pm SD)	1.5 \pm 0.9	1.8 \pm 1.4	1.2 \pm 0.8	1.3 \pm 0.6	.001*
Functional status (NYHA) (mean \pm SD)	1.8 \pm 0.7	2.0 \pm 0.7	1.7 \pm 0.7	1.8 \pm 0.6	.034*
Total hospital length of stay (mean \pm SD)	12.9 \pm 19.9	13.2 \pm 23.1	15.0 \pm 19.9	13.9 \pm 20.4	.930

SD, standard deviation; NYHA, New York Heart Association.

* $P < .05$

taking and their recording of patient-reported complaints, although it is not clear that this limitation would lead to a systematic bias in the findings. Furthermore, the reliability of our delay data is strengthened by the fact that the Patient Treatment Files used in automated record keeping required that all fields be completed, as described earlier. In addition, the use of the Patient Treatment Files supports independent corroboration among the physicians performing the admission profiles.

Finally, in regard to limitations, other factors have been implicated in delay time. We did not have access to such potentially important data as disease severity, risk factors, or differences in manifestations of symptoms between African Americans and other patients. Without valid clinical data, any relationships between race and health must be seen as exploratory—conclusions regarding cause and effect of observed racial variations cannot be made. Ultimately, the significance of knowing that African Americans with HF have longer delay times and higher readmissions rates without accounting for potential race differences in clinical variables (such as disease severity or comorbidities) and psychosocial variables (such as compliance, quality of care, and social support) is unclear. Although these limitations are important, the VA system, with its homogeneous population, offered a unique opportunity to control for access to care and, to a lesser degree, wealth. Likewise, we cannot ascertain that there is reason to believe that the magnitude of racial differences in treatment delay is clinically significant because there are currently no data published to support the clinical implications of our findings. Instead, prospective studies using primary care data collection are required to better understand whether observed racial differences can be accounted for by factors such as patient's clinical characteristics, health and functional status, or preferences for treatment options.

Summary

The current study supports that racial differences in treatment-seeking delays is an issue that requires further

examination. It is possible that African Americans have longer delays for a variety of reasons, including differences in disease severity, lack of awareness of symptoms, limited access to health care resources, and poor compliance with treatment regimens. The influence of a variety of factors could also affect seeking of treatment such as age, sex, socioeconomic status and educational status, availability of transportation, distance from hospital, health insurance, and presence of social support. These data are unique because the study was conducted in a population that has equal access to health care. Further prospective studies of the treatment-seeking behavior of patients with HF symptoms are needed.

Nevertheless, the findings of this study provide valuable information related to patients at risk for long treatment-seeking delays. This information should alert practitioners and scientists to the role of sociocultural factors in symptom perception and evaluation in relation to treatment-seeking behavior. The ultimate goals are to provide culturally sensitive education for disadvantaged populations on early symptom recognition and to encourage patients to seek medical care promptly. Preventive campaigns aimed at African Americans need to address expectations about HF symptoms, educate about benefits and appropriate actions, and provide legitimacy for taking specific health care actions. Better symptom monitoring and interpretation by patients can improve their response to changes in their conditions, decrease unnecessary hospitalizations, and ultimately improve the quality of life of patients with HF.

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