

A Review of Disparities in Care for Heart Failure

Chioma O Onyekwelu^{1*} and Robert T Faillace^{1,2}

¹Department of Medicine, Jacobi Medical Center, Bronx, New York, Unites States

²Albert Einstein College of Medicine, Bronx, New York, Unites States

*Corresponding author: Chioma O Onyekwelu, Department of Medicine, Jacobi Medical Center, Bronx, New York, Unites States, Tel: 718-918-5643; E-mail: Chioma.Onyekwelu@nbhn.net

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Abstract

Heart failure affects 5.7 million people in the United States, with the incidence approaching 10 per 1000 after 65 years. The reduced incidence of heart failure with reduced ejection fraction (HFrEF) is attributable to the use of guideline-directed medical therapy (GDMT), cardiac resynchronization therapy (CRT), implantable cardioverter defibrillator (ICDs), left ventricular assist devices (LVAD) and cardiac transplant, used based on patients' eligibility. Despite these advances, there is still only a 50% five-year survival rate in heart failure (HF). These drawbacks in milestones already achieved in the management of heart failure are because of complex factors including disparities in care. Racial, socioeconomic, gender, geographic disparities in medications and use of cardiac devices and mechanical circulatory support have been described in several studies and have been shown to lead to adverse health outcomes in heart failure patients.

Keywords: Heart Failure; Resynchronization therapy; Left ventricular assist devices; Guideline-directed medical therapy

Introduction

Heart failure affects 5.7 million people in the United States, is one of the leading causes of death in the United States, with the incidence approaching 10 per 1000 after 65 years [1]. Reported is a 37.5% rate reduction in the incidence of heart failure with reduced ejection fraction (HFrEF) greater than heart failure with preserved ejection fraction (HFpEF) (45.1% vs. 29.9%) [2]. This reduction is attributable to the use of guideline-directed medical therapy (GDMT), cardiac resynchronization therapy (CRT), implantable cardioverter defibrillator (ICDs), left ventricular assist devices (LVAD) and cardiac transplant, used based on patients' eligibility. Despite these advances, there is still only a 50% five-year survival rate in heart failure (HF) [1, 3-5] with the mortality rate estimated to be 18% in severe HF despite GDMT [6]. Also reported is a 35.5% increase in the rate of hospitalization from 2000 to

2010, mostly for patients 65 years and older with more than 60% of these due to non-cardiovascular causes [2].

These drawbacks in milestones already achieved in the management of heart failure are because of complex factors including disparities in care. The growing concern about differences in heart failure stems from the increased prevalence, morbidity and mortality associated with the disease [7,8].

Racial, socioeconomic, gender, geographic disparities have been described in several studies and have been shown to lead to adverse health outcomes.

Experimental

Race/Socioeconomic factors

Heart Failure is more prevalent in African Americans than Whites [7]. The annual incidence of heart failure in African Americans is 9.1 per 1,000 person-years, while in Whites; it is approximately 6 per 1000 person-years [9]. Heart Failure has also been shown to occur earlier in African Americans and when hospitalized, they have a 45% greater risk of mortality or decline in functional status compared to Whites [10].

African Americans have been reported to have more Heart Failure due to a combination of factors which include modifiable risk factors, endothelial imbalances, socioeconomic factors and quality of care [7].

Risk factors such as Diabetes, Hypertension, renal disease and obesity are common among African Americans; with the prevalence of Hypertension among the highest in the world. However, after adjusting for risk factors (including blood pressure control), African Americans remain at greater risk of heart failure [7].

Africans Americans with Heart Failure were more likely to be younger, less educated, living with insufficient income and either insured by the government or uninsured compared to whites [8]. These factors are in close association with delays in seeking treatment that stem from inadequate identification and interpretation of symptoms. However, medication adherence is not influenced by these factors [8].

Concerning clinical treatment of HFrEF, racial differences were significant in being prescribed an ACE inhibitor and hydralazine-isosorbide dinitrate, while racial differences in being prescribed a diuretic were nonsignificant after adjusting for social, demographic and clinical features. Determinants identified were low premorbid intellect and a history of kidney disease [8].

In heart failure patients with preserved EF, racial differences were considered significant in patients prescribed Digoxin (more so with the history of atrial fibrillation). Racial disparity was also significant in patients with symptomatic heart failure on diuretics; however, no significant difference was identified based on sociodemographic and clinical features [8].

Gender

Approximately 2% of women and 3% of men have heart failure [10]. However, women comprise about 50% of adults diagnosed with HF. The risk of developing HF is one in five for women and men. However, at 40 years of age, the lifetime risk of developing HF without a previous history of MI is one in six for women and one in nine for men [10,11].

In a review of literature on the cardiovascular disparities in women, women were reported to have poor diabetes and blood pressure control compared to men with fewer gender-specific recommendations on management on heart failure in guidelines [11].

Disparities in Use of Cardiac Devices and Mechanical Circulatory Support

ICD placement

Patients with HFrEF are at increased risk of sudden cardiac death from ventricular tachyarrhythmia [2,12]. Despite the fact that there is associated reduction in mortality from sudden death with the use of neurohumoral antagonists, patients with HFrEF remain at increased risk for sudden cardiac death from ventricular tachyarrhythmia. Device therapy using ICDs are recommended as class I indication for primary prevention of sudden cardiac death in select patients with non-ischemic dilated cardiomyopathy on GDMT who qualify based on defined criteria [12].

There was a 51% increase in ICD placement from 2003 to 2006. This increase is hypothesized to be secondary to expansion of eligibility criteria for ICD insertion by the Multicenter Automatic Defibrillator Implantation Trial (MADIT I and II). Also in the Sudden Cardiac Death in Heart Failure Trial (SCD HeFT) and the inclusion of ICD therapy as Centers for Medicare and Medicaid services reimbursement for eligible patients [13].

Racial disparities still exist in the rate of ICD utilization although recent studies have demonstrated increased use in ethnic minorities, in particular among the blacks. Contributing factors could be from improved physician adherence to use of

guideline-directed therapies as well as awareness of racial disparities [14].

Studies have also highlighted the gender gap in ICD utilization with the prevalence of heart failure in men twice that in women age 40 to 79 years; women tend to develop heart failure later in life (>80 years old 11.5% compared to 8.6% in men). The decreased rate of ICD insertion in women is thought to be due to a low percentage of women (<30%) in randomized controlled trials and more stringent eligibility criteria for ICD placement [14].

Recent studies have shown significant difference among insured and uninsured ICD eligible patients with only <5% of uninsured patients getting ICD insertion, and >95% implanted in insured patients. One of the leading factors could be due to cost as most patients are unable to afford to pay out of pocket for the procedure. Other factors could be ineligibility for ICD insertion, cultural, physiological, socioeconomic factors. The effect of the Affordable Care Act on ICD placement needs to be studied to show if there were any disparities in the rate of life-saving cardiac device utilization for eligible patients regarding insurance status.

Cardiac Resynchronization Therapy

Cardiac resynchronization therapy (CRT) is indicated for eligible HF patients with ejection fraction (EF) 35% or less, left bundle branch block (LBBB) with QRS duration 150 mm or greater and New York Heart Association (NYHA) functional class II, III, or ambulatory IV symptoms on GDMT [12]. Blacks (59%) are more likely to have a nonischemic cause of their heart failure compared to whites (32%). Despite these differences, racial disparities still exist in the provision of CRT-defibrillator (CRT-D) device in eligible patients with blacks and Hispanic patients less likely to receive CRT-D compared to white patients [3]. Also listed are hospital, physician and patient-related factors as possible contributors. Physicians may perceive that their minority patients are more likely to be uneducated, or non-adherent to prescribed therapies, delay seeking treatment, or refuse treatment. However, these perceptions are unlikely to influence the decision to offer CRT-D implantation or follow-up care. Geographic differences are also a possible contributor to these differences [4].

Left Ventricular Assist Device

With only a reported 18% survival at six months in patients with severe heart failure, left ventricular assist device (LVAD) and cardiac transplantation has been shown to improve the quality of life and mortality in patients with advanced HF [15]. Access to LVAD is limited and placement of this mechanical cardiac support (MCS) is affected significantly by gender, racial, age disparities as well as geographical differences. In a recent study, males were 2.3 times as likely to receive LVAD therapy as females. Incompatibility based on body size was likely the reason female patients were denied LVAD therapy in 2002 to 2003 before the advent of smaller second generation Heart Mate II LVAD (4). Patients <65 years are seven times more likely to receive LVAD compared to patients >65 years, even though

the evidence for improved survival was from the randomized evaluation of mechanical assistance for the treatment of congestive heart failure (REMATCH) trial which used patients >65 years of age [4].

White patients were 3.4 times as likely as black to receive an LVAD implantation despite black patients being 2.4 times more likely to be admitted to academic hospitals compared to blacks [4]. Recent studies are needed to assess if there is the gap in LVAD placement is bridging with recent advances in LVAD models.

Results and Discussion

Heart failure is a complex chronic medical condition with stable incidence of more than 650, 000 new cases annually over the past ten years [9,12-24]. Studies have shown gender, racial, socioeconomic and geographic disparities in the presentation and management of patients with heart failure.

African Americans have the highest risk of heart failure, with 45% greater risk of mortality or morbidity compared to whites due to a higher prevalence of risk factors such as obesity, diabetes, hypertension and renal disease [9-10,22]. Health insurance status, socioeconomic factors and quality of care in racial minorities also affect optimal medical HF management [7,8]. Racial differences exist in the rate of ICD utilization; however, recent studies show increased ICD use for ethnic minorities due to greater awareness and improved physician adherence to use of guideline-directed therapies [14].

Gender differences are present in care for heart failure. Women have poor diabetes and blood pressure control compared to men and have decreased rate of ICD insertion or LVAD placement compared to men. Plausible explanations of gender disparities are fewer gender-specific recommendations in guidelines, fewer women represented in RCTs and strict criteria for ICD and LVAD placement [4, 11,14].

With regards to health insurance status, even when eligible for a device therapy, uninsured patients are less likely to get ICD placed due to inability to afford the high cost of health care [8].

Conclusion

Disparities in heart failure management are a major drawback to the strides achieved over the years. With increased awareness, the gap in care based on these differences is closing in some aspects of care but not in some other areas. More studies are needed to identify the trend over the years and to keep increasing adherence to guideline-directed therapy to reduce further morbidity and mortality associated with heart failure regardless of gender, socioeconomic status, literacy, geographical location or age.

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