

Gender Differences in Presentation, Management and Disposition of Heart Failure Patients in the Emergency Setting

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Citation

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Abstract

Recent literature suggests heart failure may be a different entity in women than in men.

Objective: Review ED presentations, disposition, inpatient diagnostics, and outcomes to determine if gender differences exist in heart failure management.

Design: Retrospective chart review of 143 patients admitted with a primary diagnosis of CHF with comparisons between male and female patients.

Results: There were 56 male (39%) and 87 female (61%) patients of similar ages (60.9 + 13.8 vs. 60.8 + 13.7 respectively, $p=0.97$). There was no difference between males and females regarding reported dietary or medication non-compliance (65% vs. 61%, $p=0.69$) or a complaint of chest pain (34% vs. 32%, $p=0.83$). There were no gender differences in vital signs (oxygen saturation, heart rate, blood pressure) on ED presentation between males and females. Regarding disposition, 77% of males and 87% of females were admitted to the telemetry unit ($p=0.10$). Inpatient diagnostic testing demonstrated similar usage of Transthoracic Echocardiography and Dobutamine Stress Echocardiogram between males and females (54% vs. 54%, $p=0.96$). Length of inpatient stay was not significantly different between the sexes (males 5.2 + 6.2 vs. females 4.5 + 4.9 days respectively, $p=0.48$). The percentage of overall complications (renal failure, arrhythmia, cardiac ischemia, intubation, need for transfer to higher level of care, or death) was the same for males and females (12% vs. 11% respectively, $p=0.86$).

Conclusions: The study demonstrated that there were no significant gender differences in the initial presentation, disposition, and diagnostic testing of CHF patients admitted through the ED.

INTRODUCTION

Heart failure is a chronic and progressive disorder that is characterized by frequent hospital admissions and high annual mortality rates.¹ Approximately 5 million Americans have heart failure.^{2, 3} The overall prevalence of heart failure is similar in both men and women.⁴ However, recent literature suggests that heart failure may be a different entity in women than in men. Following the diagnosis of heart failure, survival is poorer in men than women, but fewer than 15% of women survive more than 8-12 years.^{2, 4} Heart failure is the leading discharge diagnosis in the Medicare population, and approximately 80-90% of patients presenting to the Emergency Department (ED) with decompensated heart failure are admitted.⁵ Up to 20% of

patients discharged with a diagnosis of heart failure are re-hospitalized within 1 month of discharge due to recurrent decompensation.⁶

Previous studies have examined gender-related differences in heart failure patients in the inpatient and outpatient settings.^{4, 7, 8, 9, 10}

Emergency departments evaluate a significant number of patients with heart failure on a daily basis and could serve as an important resource in identifying gender-related differences in heart failure patients; however, there have been no studies evaluating differences in presentation, management and disposition in the emergency setting.

Because of the relatively high volume of heart failure patients passing through emergency departments, this retrospective study examined the ED presentation, disposition, inpatient diagnostic testing, and outcomes of patients admitted for decompensated heart failure.

METHODS

This was a single-center, retrospective review of patients admitted with the primary diagnosis of decompensated heart failure from the ED of an urban academic teaching hospital in a largely African American and Latino neighborhood. The study period was from September 1999 to April 2000. This study protocol was reviewed and approved by the Institutional Review Board. Patients were consecutively chosen from the ED admission logbook and the Patient Intake Notification (PIN) forms with the primary diagnosis of decompensated heart failure. Emergency department data was obtained from review of the ED chart. Hospitalization data and clinical outcomes were obtained from review of the formal medical record and the hospital based electronic patient care record.

Data collected from the patients' ED records included age, gender, vital signs on presentation (blood pressure, heart rate, and pulse oximetry), self-reported history of either dietary or medication non-compliance associated with ED presentation, presence of a complaint of chest pain, ED interventions, and final disposition. Data collected from the patients' inpatient records included diagnostic testing, length of stay, and any inpatient complications. Complications reviewed included acute onset renal failure, arrhythmia, cardiac ischemia, mechanical intubation, need for transfer to a higher level of care, and death. A total of 143 patients were identified.

Statistical analysis including independent sample t-tests and chi-square analysis were performed using SPSS 11.5. ¹¹

RESULTS

Chart review over this 8-month period identified 143 patients with the primary diagnosis of decompensated heart failure. Of the 143 patients identified through the logbook, 143 (100%) medical records were available and included in data analysis.

Of these 143 patients, 56 (39%) were male and 87(61%) were female patients of similar ages (60.9 ± 13.8 vs. 60.8 ± 13.7 respectively, $p=0.97$). (Table 1) There was no significant difference in the racial distribution of male and

female patients. The presentation symptom of chest pain was not significantly different for male and female patients (19 (34%) vs. 28 (32%) respectively, $p=0.83$). The presentation symptom of dyspnea was similar for male and female patients (51 (92%) vs. 80 (92%) respectively ($p=0.85$) and the acute onset of symptoms was similar for male and female patients (15 (27%) vs. 25 (29%) respectively ($p=0.80$).

Figure 1

Table 1: Demographics of the 143 Patients by Gender

	Overall	Male	Female	p-value
N	143 (100%)	56 (39.2%)	87 (60.8%)	-
Age	60.9 ± 13.7	60.9 ± 13.8	60.8 ± 13.7	0.97
Race				
Black	106 (75.1%)	37 (66.1%)	69 (79.3%)	0.08
Hispanic	22 (15.4%)	12 (21.4%)	10 (11.5%)	0.11
White	12 (8.4%)	6 (10.7%)	6 (6.9%)	0.42
Other	3 (2.1%)	1 (1.8%)	2 (2.3%)	0.83
Presenting Symptoms				
Chest Pain	47 (32.9%)	19 (33.9%)	28 (32.2%)	0.83
Dyspnea	131 (91.6%)	51 (91.1%)	80 (92.0%)	0.85
Acute Onset	40 (28.0%)	15 (26.8%)	25 (28.7%)	0.80
Pulse Oximetry	94.0 ± 4.2	93.5 ± 4.4	94.4 ± 4.1	0.22
Heart Rate (BPM)	90.9 ± 17.4	92.7 ± 15.4	89.8 ± 18.5	0.34
Systolic BP (mmHg)	147.4 ± 29.3	147.0 ± 27.8	147.6 ± 30.4	0.92

There was no overall difference in vital signs (pulse oximetry, heart rate, systolic and diastolic pressure) on ED presentation between males and females.

Regarding disposition from the ED, there were no statistically significant differences in disposition patterns with 43 (77%) males and 76 (87%) females admitted to a telemetry unit; 9 (16%) males and 6 (7%) females admitted to the general medical unit, and 4 (7%) males and 5 (6%) females admitted to an intensive care unit.

Inpatient diagnostic testing demonstrated similar usage of diagnostic modalities: Transthoracic Echocardiography (TTE) or Dobutamine Stress Echocardiogram (DSE) with 30 (54%) of males and 47 (54%) of females receiving at least one of

these evaluations. Other diagnostic procedures included Multiple Gated Acquisition (MUGA) Scans (0 males, 2 (2%) females); cardiac catheterization (4 (7%) males, 10 (11%) females); more than one diagnostic test was performed (1 male (2%), 8 females (9%)).

Length of stay was not significantly different between males and females (5.2 ± 6.2 days vs. 4.5 ± 4.9 days respectively, $p=0.48$)

The percentage of overall complications reviewed were similar for males and females (12% vs. 11% respectively, $p=0.86$) (Table 2)

Figure 2

Table 2: Complications of the 143 Patients by Gender

	Overall	Male	Female
Total N	143 (100%)	56 (39.2%)	87 (60.8%)
Any Complication	17 (11.9%)	7 (12.5%)	10 (11.5%)
Renal Failure	6 (4.2%)	3 (5.4%)	3 (3.4%)
New Onset Arrhythmia	8 (5.6%)	4 (7.1%)	4 (4.6%)
Death	2 (1.3%)	1 (1.8%)	1 (1.1%)
Transfer to Higher Level of Care	2 (1.3%)	0 (0%)	2 (2.3%)
Intubation	0 (0%)	0 (0%)	0 (0%)
Ischemia	3 (2.1%)	2 (3.6%)	1 (1.1%)

DISCUSSION

Decompensated heart failure is now the leading discharge diagnosis in the Medicare population.^{2, 3} Heart failure is a chronic condition that carries a high burden of mortality and morbidity in both men and women.^{2,3, 12} Early literature regarding gender differences and overall survival rates for heart failure patients has yielded conflicting data.¹³ Several studies have shown a more favorable prognosis for women than for men with symptomatic heart failure.¹³ In the Framingham study, women had a median survival of 3.2 years compared with 1.7 years for men following the diagnosis of heart failure.^{13, 14} In contrast, data from the Studies of Left Ventricular Dysfunction (SOLVD) Trial registry reported poorer outcomes in women with mortality rates of 22% for women compared to 17% for men.^{13, 15} Studies have suggested that there are gender-based differences in survival rates, and that gender also influences the etiology of heart failure. Hypertension and Diabetes mellitus are stronger risk factors for developing heart failure in women than for men.¹³

Given gender differences in the etiology and presentation of heart failure, several studies have suggested gender bias in patient management.^{4, 7,8,9,10, 16,17} Mejhert and colleagues report that women with heart failure are less likely to undergo echocardiography and hence are prescribed sub-optimal doses of Angiotensin Converting Enzyme (ACE) Inhibitors when compared to men.¹⁸ Lindenfeld and colleagues suggest that women are disproportionately affected by age differences in heart failure management.¹⁹

This analysis examined patients admitted for heart failure exacerbation from the ED of an urban, academic teaching center during an 8 month period for gender differences in presentation, management, disposition, and outcomes.

Our study found that despite a predominance of female patients, there were no statistically significant gender differences in the initial ED presentation, level of acuity, ED management, the eventual disposition and outcomes for these patients. Gender did not appear to influence management decisions, as nearly equally numbers of male and females were admitted to monitored settings, underwent diagnostic testing, and had similar lengths of stay.

STUDY LIMITATIONS

This study was a retrospective chart review of a single urban academic ED, so may not be generalizable to other populations. To be included in the study, a patient must have been admitted with the diagnosis of heart failure. Patients treated and discharged from the ED were not readily identified and were not included in the study. Several variables of interest including ejection fraction, presence of diastolic dysfunction, co-morbidities were not recorded or easily identified from the chart review and were not included in the analysis. In addition, the relatively small sample size may have undermined our ability to detect statistically significant gender differences. A larger study population or multicenter study may be needed to further evaluate potential gender differences.

CONCLUSION

Given the prevalence of heart failure patients in the emergency setting, it is important to evaluate if gender differences do exist especially in disease presentation as the impact on management and outcomes can be significant.

The study demonstrated that there were no significant gender differences in the initial presentation, disposition, and diagnostic testing of CHF patients admitted through the ED.

References

1. Kostuk WJ. Congestive heart failure: what can we offer our patients? CMAJ.JAMC 2001; 165: 1053-1055.
2. ACC/AHA Task Force on Practice Guidelines. Guidelines for the evaluation and management of heart failure. American College of Cardiology and the American Heart Association 2001: 1-57.
3. American Heart Association. 1998 Heart and Stroke Statistical Update. Dallas, TX: AHA, 1997.
4. Stromberg A, Martensson J. Gender Difference in patients with heart failure. Eur J Cardiovasc Nurs. 2003; 2: 7-18.
5. Aghababian R. Acutely Decompensated Heart Failure: Opportunities to improve care and outcomes in the emergency department. Rev in Cardiovas Med. 2002; 3 suppl 4.
6. Hunter CB, Hilleman DE, Malesker MA, et al. Impact of Nesiritide on health care resource utilization in acute decompensated heart failure. Heart Failure Society of America 6th Annual Scientific Meeting. 2002, Abstract 221.

7. Vaccarino V, Chen YT, Wang Y et al. Sex differences in the clinical care and outcomes of congestive heart failure in the elderly. *Am Heart J.* 1999; 138:835-42.
8. Adams KF, et al. Gender differences in survival in advanced heart failure. Insights from the FIRST study. *Circulation.* 1999; 99:1816-21.
9. Mendes LA, et al. Congestive heart failure in patients with coronary heart disease: the gender paradox. *Am Heart J.* 1997; 134:207-12.
10. Tandon S, et al. Clinical profile of chronic heart failure in elderly women. *Am J Geriatr Cardiol.* 2002; 1:318-23.
11. SPSS for Windows. Chicago,IL: SPSS, Inc., 2002.
12. Costantini O, Huck K, Carlson MD, et al. Impact of a guideline-based disease management team on outcomes of hospitalized patients with congestive heart failure. *Arch Intern Med* 2001; 161:177-82.
13. Pina IL, Buchter C. Heart failure in women. *Cardiol Rev* 2003; 11: 337-344.
14. Levy D, Larsen MG, Vasan RS, et al. The progression from hypertension to congestive heart failure. *JAMA* 1996; 275:1557-1562.
15. Bourassa MG, Gurne O, Bangdiwala SI, et al. Natural history and patterns of current practice in heart failure. *J Am Coll Cardiol.* 1993; 22: 14A- 19A.
16. Joshi AV, D'Souza AO, Madhavan SS. Differences in hospital length-of-stay, charges, and mortality in congestive heart failure patients. *Congest Heart Fail* 2004; 10: 76-84.
17. Peyster E, Norman J, Domanski M. Prevalence and predictors of heart failure with preserved systolic function: community hospital admissions of a racially and gender diverse elderly population. *J Card Fail* 2004; 10: 49-54.
18. Mejhert M, et al. Diagnostic tests, treatment and follow-up in heart failure patients-is there a gender bias in the coherence to guidelines? *Eur J Heart Fail*, 1999; 1:407-10.
19. Lindenfeld J, et al. Age, but not sex, influences the measurement of ejection fraction in elderly patients hospitalized for heart failure. *J Card Fail.* 2003; 9:100-6.

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