



Depression in Heart Failure Patients and the Influence of Age, Gender and Severity of Depression on Heart Failure Patients

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Abstract

Background: Depression is common in chronic medical illnesses including HF. It has been established that depression has different rates in different races and the reported depression rates among hospitalized patients range from 13% to 77%; nevertheless, there is remarkably little information on the prevalence of depression and the impact of demographic and health status in the north of IRAN. The goal of this study was to determine the prevalence of depression in hospitalized heart failure (HF) patients, as well as the impact of age, gender, and functional status on this group of patients.

Methods: In this study, carried out in one heart center, a total of 196 hospitalized HF patients with New York Heart Association (NYHA) functional classes 2- 3 and 4 and an ejection fraction (EF) <40% were given questionnaires to assess depression. Depression was evaluated with the Beck Depression Inventory (BDI) questionnaire. Depression was defined as a score on the BDI of ≥ 17 .

Results: A total of 23.5% of the patients scored as depressed. Men were more likely (33%) to be depressed than women and had a higher mean BDI score ($p=0.004$). Patients classified as NYHA functional class 3 were more likely to score as depressed than class 2 patients ($p=0.001$), and patients with a higher BDI score had a lower EF ($r=0.25$, $p=0.001$).

Conclusion: Depression is common in patients with HF. Men and patients with lower health status are more likely to be depressed. Pharmacologic or non-pharmacologic treatment of depression in HF patients should be considered.

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Introduction

Depression is 4-5 times as common in heart failure (HF) patients as in the general population, and it might confer a higher risk of developing HF and negatively affect prognosis in established HF.¹

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Heart failure mortality is about 25% at 1 year and 59% for men and 45% for women by 5 years.² About 5% to 10% of the general population have the criteria for depression, and the reported depression rates among hospitalized HF patients range from 13% to 77.5%,³⁻⁶ and 13% to 42% for outpatients.⁷⁻⁹ The wide range of prevalence rate reported across studies is likely the result of the use of different patient population in terms of mean age, gender make-up, and disease severity.

Depression is a chronic and disabling condition and may have important effects on many Quality of Life (QOL) aspects in patients with HF. In HF patients, depression is associated with more frequent hospital admissions and worse New York Heart Association (NYHA) functional classification.^{6,9,10} It has been reported that depressed patients have higher mortality rates.^{5,11} The potential importance of depression in HF patients and a lack of adequate information regarding the influence of age, gender, and Asian race on the frequency of depression in HF patients prompted us to conduct this study.

Methods

Patients were recruited from an inpatient heart center from Sep. 2004 to Dec. 2005. All the patients had an ejection fraction of <40%, documented by echocardiography, and were in NYHA functional classes 2- 3 and 4. None of the participants had HF due to thyroid disease or a recent acute myocardial infarction. None of the participants was pregnant. The patients were approached and asked on the discharge day,

and informed consent was obtained. Each patient completed a questionnaire to provide demographic information, including age, gender, marital status, and history of ischemic heart disease, hypertension, diabetes, and concurrent medications. Then the survey questionnaires to assess depression were filled out by the patients. Depression was assessed with the Beck Depression Inventory (BDI). The BDI is the most widely-used tool for the self-assessment of depression in clinical research. It consists of 21 items, each with four response options. The scale is intended to rate the severity of depression in individuals aged 13 years or older. Depression was defined as a score on the BDI \geq 17.

The Chi-square or t-tests were used to examine the differences in demographic characteristics and illness severity. The Pearson correlation coefficients were utilized to examine the relationships of age and left ventricular ejection fraction with degree of depression.

Results

This study recruited 196 patients (48% were men), ranging in age from 43 to 90 years (mean 65 ± 10) (Table 1). From this total, 26% were smokers, 52% were hypertensive, and 23% had diabetes mellitus. A majority of the patients were being treated with angiotensin-converting enzyme inhibitors, beta blockers, diuretics, and digoxin. The left ventricular ejection fraction ranged from 15% to 35% (mean $31 \pm 4\%$), and about 70% of the patients were classified as NYHA functional class 2. None of the patients was receiving an antidepressant medication. A total of 25% of the patients lived alone.

Table1. Demographic and Health Status Characteristics of Patients with Heart Failure

variable	all patients n = 196	depressed patients n=46	non-depressed patients n = 150	p value
Age (y)*	65 \pm 10	67 \pm 10	64 \pm 9	0.046
Gender				0.004
Male	94(48%)	31(33%)	63(67%)	
Female	102(52%)	15(14.7%)	87(85.3%)	
Education				NS
<6 yrs	119(60%)	35(29.4%)	84(70.6%)	
6 to 9 yrs	52(26%)	9(17.3%)	43(82.7%)	
9 to 12 yrs	9(5%)	0	9(100%)	
High school	7(4%)	1(14.3%)	6(85.7%)	
College graduate	9(5%)	1(11.1%)	8(88.9%)	
Living status				NS
Living alone	49(25%)	14(28.6%)	35(71.4%)	
Living with someone	147(75%)	32(21.8%)	115(78.2%)	
Ejection Fraction (%)*	31 \pm 4	31 \pm 4	31 \pm 3	NS
NYHA class				0.005
II.	138(70%)	24(17.4%)	114(82.6%)	
III.	57(29%)	22(38.6%)	35(61.4%)	
IV.	1(1%)	0	1(100%)	
Medication				NS
Diuretics	128	56(44%)	72 (56%)	
Digoxin	133	59(44%)	74(56%)	
ACE inhibitor	86	32(37%)	54(63%)	
Beta blocker	87	28(32%)	59(68%)	

NYHA, New York heart association; NS, Non-significant; ACE, Angiotensin converting enzyme

*Data are presented as mean \pm standard deviation



About 23.5% of the patients had depression as assessed with the BDI. The BDI scores varied from 2 to 28 (mean 12 ± 6). Approximately 66% of the patients had $BDI \geq 10$, and none of them was severely depressed.

The average age of the patients with $BDI \geq 17$ was statistically significantly higher than that of the ones with $BDI < 17$ (67 ± 10 vs. 64 ± 9 , respectively; $p = 0.046$). Men with HF were more likely (33%) to score as depressed as women (14.7%) (Chi-square [$n = 196$, $df = 1$] = 9.2, $p = 0.004$). The mean BDI was 14 ± 6 for men and 11 ± 5 for women ($p < 0.05$).

Other factors

Educational status and living alone had no effect on the prevalence of depression. There was no significant difference between those who scored as depressed and those who did not in terms of the use of diuretics, digoxin, angiotensin-converting enzyme inhibitors, or beta blockers. The patients scoring as depressed had a higher prevalence of hypertension than those who did not (Chi-square [$n = 196$, $1df$] = 5.7, $p < 0.05$) but did not differ in history of diabetes mellitus.

Only one of our patients was in NYHA functional class 4 who was not depressed. The mean BDI of the patients in NYHA functional classes 3 and 2 was 15 ± 5 and 12 ± 6 , respectively ($p < 0.001$). The frequency of $BDI \geq 17$ differed significantly according to NYHA functional class ($p = 0.005$), and the patients classified as NYHA functional class 3 were more likely to score as depressed than did class 2 patients. The mean EF in the patients scoring ≥ 17 was 31 ± 3 and in those scoring < 17 was 31 ± 4 . The patients with a higher BDI score had a lower EF ($r = 0.25$, $p = 0.001$).

Discussion

In this study, 23.5% of our HF patients had BDI scores of depression; it can be, therefore, concluded that depression is common in the HF population. Previous studies have also reported a high prevalence of depression in hospitalized HF patients,^{3-6,12} but it is worthy of note that there has been no study in IRAN to date. In the present study, a BDI cutoff of 17 was designed; and some patients scoring as depressed would not have other definitions of depression and the exact frequency of depression is certainly affected. This has been previously noted.^{7,13}

In the general population, major depression has been reported to be common in individuals with chronic medical illness. The diagnostic and Statistical Manual of Mental Disorders-Forth Edition (DSM- 4-text revision) states that approximately 20% to 25% of people with general medical conditions will become depressed during the course of their chronic condition. Depressed patients with a range of medical illnesses, including end -stage renal disease, cancer, and HF

had an odds ratio of 3.03 (95% CI 1.96, 4.89) when compared with non-depressed patients with similar illnesses for non-compliance with medical recommendations, according to a 2000 meta- analysis by DiMatteo et al.¹⁴ In a recent study of 496 patients under treatment for hypertension, depression was found to be the only variable independently associated with higher odds of non-compliance;¹⁵ furthermore, patients who are depressed are less likely to adhere to cardiac rehabilitation programs after myocardial infarction.^{16,17} One study looking at psychological variables and compliance specifically in HF patients found that higher mental health was predictive of overall compliance behavior.¹⁸ Therefore, depressed HF patients may be at a higher risk of non-adherence to both pharmacologic and behavioral recommendations, and consequently at risk for poor outcomes. There has been no publication on the effect of gender on depression in HF patients,¹³ but in the general population women are more likely to experience depression. In the present study, in contrast to what is seen in the general population, depression was significantly more common and more severe in the men than it was in the women. The prevalence of depression is 5.0% in 19- 29 year olds, 7.5% in 30- 44 year olds, and 1.4% in those 65 years and older.¹⁹ In the present study, the average age of the depressed patients was statistically significantly higher than that of the ones with $BDI < 17$, which is consistent with some prior studies.^{13,19} In the current study, the pharmacologic treatment in HF patients with digoxin, diuretics, ACE inhibitors, or beta blockers was not associated with an increased frequency of depression. It has been reported that the use of beta blockers is associated with an increased risk of depression.^{20,21} A recent meta- analysis,²² as well as some other reports,¹⁵ has not found this.^{23,24} Consequently, depression is not a reason to withhold beta blockers in HF patients. The current study showed that patients with NYHA functional class 3 were more likely to experience depression than class 2 patients. Baseline functional status including limitation of daily activities is related to depression. It has been reported previously that depressed HF patients may perceive their quality of life to be lower and to underestimate their functional status.¹³ This may lead physicians caring for depressed HF patients to classify them as more severely compromised. But in the present study patients with a higher BDI score had a lower EF.

It is, therefore, possible that depressed patients have more advanced HF. The impact of behavioral and pharmacologic treatment of depression on the HF patients remains inadequately studied. A recent study evaluated the effect of stress management training for patients with HF and found significant improvement in stress, emotional distress, 6-min walk, and symptoms of depression.²⁵ Another retrospective study found that, in depressed HF patients, costs were higher than for non-depressed patients.²⁶

However, it seems, large-scale investigations need to be done in this regard.



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