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Anxiety and depression status of patients with heart failure

Kalp yetersizliği hastalarında depresyon ve anksiyete

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Abstract

Purpose: Heart failure (HF) is characterized by chronic, progressive impairment of cardiac functions and is associated with high mortality and morbidity. Psychological symptoms such as depression and anxiety are common among patients with HF and related to mortality, poor function, and treatment adherence failure. In this study we aimed to screen the depression and anxiety symptoms among patients with HF.

Materials and methods: In this cross-sectional, observational study, the Hospital Anxiety and Depression Scale (HAD) was used. A total number of 140 patients diagnosed with HF (94 male, 46 female) under follow-up for at least one year were enrolled into study. Statistical analyses were performed using SPSS.

Results: The mean depression score was 9.5±3.9, and the mean anxiety score was 8.9±4.1. According to the cut-off scores, 74% of the patients had depressive symptoms, whereas 39% of the patients regarded as having anxiety symptoms. The depression and anxiety scores were significantly higher in NYHA Class 3-4 patients compared with those in NYHA Class 1-2. There was positive correlation between duration of disease and depression scores. Patients sleeping less than 6 hours had higher level of depression and anxiety scores.

Conclusion: The present study provides evidence of high prevalence rates of depression and anxiety symptoms in patients with HF. This study might guide us to psychological or medical treatment for psychological disorders among patients with HF.

Key words: Depression, anxiety, heart failure, hospital anxiety and depression scale (HAD).

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Öz

Amaç: Kalp yetersizliği, kalp fonksiyonlarının kronik, ilerleyici bozukluğu ile karakterize, yüksek mortalite ve morbiditesi olan bir durumdur. Depresyon ve anksiyete gibi psikolojik semptomlar kalp yetersizliği hastalarında sık görülmekle birlikte, mortalite, fonksiyon bozukluğu ve tedaviye uyum zorluğu gibi sorunlarla da ilişkilidir. Bu çalışmada, kalp yetersizliği hastalarında depresyon ve anksiyete semptomlarını araştırmayı planladık.

Gereç ve yöntem: Bu kesitsel gözlem çalışmasında Hastane Anksiyete ve Depresyon Ölçeği (HAD) kullanılmıştır. Kalp yetersizliği tanılı toplamda 140 hasta (94 erkek, 46 kadın) çalışmaya dahil edilmiştir. İstatistiki analiz için SPSS programı kullanılmıştır.

Bulgular: Ortalama depresyon skoru 9,5±3,9 ve ortalama anksiyete skoru 8,9±41 bulundu. Kesme puanı değerlerine göre hastaların %74'ünde depresyon ve %39'unda anksiyete semptomu saptandı. Depresyon ve anksiyete skoru NYHA sınıf 3-4'te diğer sınıflara göre daha yüksek bulundu. Hastalığın süresi ile depresyon arasında pozitif korelasyon saptandı. Günde 6 saatten az uyuyan hastaların depresyon ve anksiyete skorları daha yüksek bulundu.

Sonuç: Çalışmamızda, kalp yetersizliği olan hastalarda yüksek oranda depresyon ve anksiyete semptomu saptanmıştır. Bu sonuçlar, kalp yetersizliği olan hastaların psikolojik semptomları için tedavi gereksinimi olduğunu göstermektedir.

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Anahtar kelimeler: Depresyon, anksiyete, kalp yetersizliği, hastane anksiyete ve depresyon ölçeği (HAD).

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Introduction

Heart failure (HF) is a chronic condition associated with high mortality and morbidity. The prevalence of HF is more than 6 million in US and approximately 7% in Turkey [1, 2].

The patients with HF have decreased quality of life, frequent hospitalization, treatment adherence failure and psychological problems. Depression and anxiety are most common psychological disorders that can seriously affect patients' health care with HF [3]. Epidemiological studies showed a high prevalence rate of depression and anxiety among patients with HF. Depending on how depression and anxiety were evaluated, the rate of depression and anxiety reaches up to 60% in patients with HF [4-7]. On the other hand, depression increases the mortality rate up to two fold in HF patients [8].

Depression is also associated with negative outcomes and secondary events in patients with HF. The psychological consequences influence not only patient's life, but also their family, caretakers and society. The underestimation of these symptoms can also overburden to patients.

A way to reduce the burden of cardiovascular disease is to screen patients in terms of comorbid psychological symptoms such as depression and anxiety. In this study, our aim was to screen the prevalence of depression and anxiety symptoms in patients with HF.

Materials and methods

Study design and patient characteristics

In this cross-sectional observational study, patients diagnosed with Heart Failure (HF) were enrolled into study. Patients in centers (Istanbul University-Cerrahpasa Department of Cardiology and Istanbul University Institute of Cardiology) were asked to participate into study. A total of 180 patients with HF were voluntary to be involved into study. The complete data of 140 patients were eligible for this study (others had lack of clinical data, incomplete questionnaires). Patients were under follow-up for at least one year in each center.

Data collection

Sociodemographic data such as sex, age, body mass index, education status, marital status, employment status, income level, habits (smoking, alcohol), physical activity, sleep duration, psychiatric drug use, and concomitant disease information (e.g. diabetes, thyroid disease) were investigated in a tabulated form. Information about disease, such as duration of disease, left ventricle ejection fraction (LVEF), New York Heart Association (NYHA) functional classes, and etiology of heart failure were recorded by one specialist outpatient clinic physician in each center.

Hospital Anxiety and Depression Scale (HAD)

The screening questionnaire for psychological symptoms was the Hospital Anxiety and Depression scale (HAD), which is a self-report questionnaire with very high reliability and validity [9]. This questionnaire is often used in hospital settings to screen the anxiety and depression status of patients. The Turkish reliability and validity study was performed by Aydemir et al. [10]. It consists of 14 questions, half of which relate to anxiety and the rest are about depression. The cut-off score is 7 for depression and 10 for anxiety in the Turkish form.

Inclusion criteria

Patients aged over 18 years, under treatment for HF in the above-mentioned centers for at least one year, and were willing to participate were included.

Exclusion criteria

Exclusion criteria were as follows: decompensation of heart failure within the last month, severe neurologic and/or pulmonary complications, and refusal to join into the study. All patients provided written informed consent.

Statistical analysis

All statistical analyses were performed using the Statistical Package for the Social Sciences version 21 (SPSS for Windows, Chicago, IL, USA). Patient characteristics were summarized using mean ± SD values and percentages. The comparison test (Student t test) was used to compare the HAD scores according to clinical variables of sex, age, body mass index, education status, marital status, employment status, income level, smoking habit, physical activity, sleep duration, and diet adherence. Clinical correlations were done by Pearson test. A p value <0.05 was considered statistically significant.

The study complied with the Declaration of Helsinki and was approved by the Ethics Committee for human research of Istanbul University Cerrahpasa School of Medicine.

Results

Socio-demographic findings

A total 140 patients (94 male, 46 female) were eligible for the study. The mean age was 60.0±11.4 years (range, 26-80 years). Eighteen patients (13%) were younger than 45 years, 83 patients (59%) were aged between 45-65 years, and 39 patients (28%) were older than 65 years. According to their body mass index (BMI) 51 patients (37%) were normal, 62 patients (44%) were overweight, and 16 patients (11%) were obese and 11 patients (8%) were morbidly obese (Table 1).

Twenty percent of patients (n=27) were single. Twelve percent of patients (n=17) were living alone. Sixty nine percent of patients (n=96) were retired/not working. Twenty percent of patients (n=28) are smoking, thirty three percent of patients (n=46) were ex-smoker. Eighty three percent of patients (n=116) didn't do regular physical activity. Thirty five percent of patients (n=50) were sleeping less than 6 hours in a day. Fourteen percent of patients (n=19) were using antidepressant drugs and five percent of patients (n=5) using anxiolytic medicines. Nearly half of the patients (46%, n=64) had concomitant diabetes mellitus (DM).

Clinical findings

The mean duration of disease was 6.5±4.1 years (range, 1-20 years). Left ventricular ejection fraction (LVEF) of half of the patients was 25-40%. One third of patients had 40-50% ejection fraction rate. Forty seven percent of the patients were in NYHA Class 2, and 41% were in NYHA Class 3. Eighty four percent of the patients had coronary heart disease as etiology (Table 2).

Prevalence of depression and anxiety symptoms

Depression

The mean depression score was 9.5±3.9 (median 10). According to cut-off scores, 74% of the patients (n=103) had depression symptoms. When we excluded the patients receiving antidepressant drugs, the ratio didn't change (73%; mean 9.4±3.9, median 10).

Anxiety

The mean anxiety score was 8.9±4.1 (median 9). According to cut-off scores, 39% of the patients (n=54) had anxiety symptoms.

Clinical correlations

There was positive correlation between disease duration and depression score (r=0.3, p<0.01). The age of patients was found positively correlated with depression score (r=0.2, p=0.01) (Table 3). Gender, body mass index, diet adherence, education, marital status, habitation status, fixed income, smoking and alcohol habits, comorbid diseases didn't affect depression score (p>0.05). Retired patients had a higher depression score compared with those who were employed (10.0 vs 8.4; p=0.03) (Table 1).

Patients doing regular physical activity had obviously lower depression scores compared to those didn't do (6.9 vs 10.0; p<0.01). Patients doing regular physical activity more than 3 hours in a week had also lower depression scores compared to those doing physical activity 1 to 3 hours in a week (5.5 vs. 9.0; p<0.01). Patients walking more than 60 minutes in a day had apparently lower depression score than those walking 30-60 minutes in a day (3.6 vs. 8.8; p<0.01). The mean depression score was high in patients sleeping less than 6 hours in a day (p<0.01). Left ventricular ejection fraction didn't affect depression score (p>0.05). While mean depression score was 5.9 in NYHA class I patients, it was 10.5 in class III and 15.2 in NYHA class IV patients (p<0.01) (Table 2).

Table 1. The sociodemographic data and depression and anxiety scores of patients

Characteristics	Value	Depression Score	Anxiety Score
Participants	n=140	9.5±3.9	8.9±4.1
Gender		*p*=0.17	*p*=0.95
Male	94 (67%)	9.2	8.9
Female	46 (33%)	10.1	9.0
Age		***p*<0.01**	*p*=0.24
<45	18 (13%)	8.6	8.5
45-65	83 (59%)	8.9	9.5
>65	59 (28%)	11.1	9.9
BMI		*p*=0.24	*p*=0.24
<24 (normal)	51 (37%)	10.0	8.8
25-29 (overweight)	62 (44%)	8.8	8.7
>30-34 (obese)	16 (11%)	9.7	9.3
35-40 (morbidly obese)	11 (8%)	10.9	10.4
Education Status		*p*=0.66	*p*=0.85
Primary school or less	80 (57%)	9.6	8.9
Secondary school or more	60 (43%)	9.3	9.0
Marital Status		*p*=0.58	***p*=0.02**
Married	113 (81%)	9.6	8.6
Single	27 (19%)	9.1	10.5
Habitation Status		*p*=0.80	***p*=0.05**
with family	123 (88%)	9.5	8.7
Alone	17 (12%)	9.2	10.8
Employment Status		***p*=0.03**	*p*=0.24
Employed	44 (31%)	8.4	9.5
Retired	96 (69%)	10.0	8.7
Fixed Income		*p*=0.22	*p*=0.94
Yes	92 (66%)	9.2	9.0
No	48 (34%)	10.0	8.9
Smoking Habit		*p*=0.06	*p*=0.06
Smoker	28 (20%)	8.4	8.8
Ex-smoker	46 (33%)	9.0	7.9
Non-smoker	66 (47%)	10.3	9.7
Alcohol Consumption		*p*=0.43	***p*=0.02**
Drinker	6 (4%)	7.8	4.6
Ex-drinker	35 (25%)	9.1	9.4
Non-drinker	99 (71%)	9.7	9.0
Regular Exercise		***p*<0.01**	***p*<0.01**
Yes	24 (17%)	6.9	5.9
No	116 (83%)	10.0	9.6
Sleep Duration		***p*<0.01**	***p*=0.04**
<6 hours	50 (36%)	11.1	10.1
6-8 hours	55 (39%)	8.7	8.4
>8 hours	35 (25%)	8.3	8.2
Concomitant Diseases		*p*=0.18	*p*=0.64
with	96 (69%)	9.2	9.1
without	44 (31%)	10.1	8.7
Obey to diet		*p*=0.14	*p*=0.64
Yes	59 (42%)	8.9	8.8
No	81 (58%)	9.9	9.1

BMI: Body mass index

Table 2. The clinical data and depression and anxiety scores of patients

Characteristics	Value	Depression Score	Anxiety Score
Disease Duration		***p*<0.01**	*p*=0.81
<5 years	74 (53%)	8.7	9.0
5-10 years	40 (29%)	9.6	8.6
>10 years	26 (18%)	11.5	9.2
LVEF (Left Ventricular Ejection Fraction)		*p*=0.27	*p*=0.35
<30%	22 (16%)	10.7	10.3
30-40%	71 (50%)	9.5	8.6
40-50%	41 (30%)	8.7	8.7
>50%	6 (4%)	10.0	10.0
NYHA Classification		***p*<0.01**	***p*<0.01**
Class 1	12 (9%)	5.9	4.8
Class 2	66 (47%)	8.9	8.4
Class 3	58 (41%)	10.5	10.0
Class 4	4 (3%)	15.2	14.5
Etiology		*p*=0.11	*p*=0.54
Coronary Artery Disease	117 (84%)	9.6	8.8
Dilated Cardiomyopathy	10 (7%)	7.0	9.3
Others	13 (9%)	9.9	10.1

LVEF: Left ventricular ejection fraction; NYHA: New York Heart Association

There was no correlation between disease duration, age and anxiety score (p=0.70, p=0.97 respectively) (Table 3). Gender, body mass index, diet adherence, education, habitation status, employment status, fixed income, smoking habit, comorbid diseases didn't affect anxiety score (p>0.05). Married patients had lower anxiety scores compared to single patients (8.6 vs. 10.5, p=0.02). Patients living with family had significantly lower anxiety scores compared to those living alone (8.7 vs. 10.8; p=0.05). Patients drinking alcohol had lower anxiety scores compared to non-drinkers (4.6 vs. 9.0; p=0.03) (Table 1).

Patients doing regular physical activity had obviously lower anxiety scores compared to those didn't do (5.9 vs 9.6; p<0.01). Patients doing regular physical activity more than 3 hours in a week had also lower anxiety scores compared to those doing physical activity 1 to 3 hours in a week (3.1 vs. 9.0; p<0.01). Patients walking more than 60 minutes in a day had apparently lower anxiety score than those walking 30-60 minutes in a day (2.6 vs. 8.0; p<0.01). The mean anxiety score was high in patients sleeping less than 6 hours in a day (p=0.04). Left ventricular ejection fraction didn't affect anxiety score (p>0.05). While mean anxiety score was 4.8 in NYHA class I patients, it was 10.0 in class III and 14.5 in NYHA class IV patients (p<0.01) (Table 2).

Table 3. The correlations between clinical data and depression and anxiety scores

Characteristics	Depression Score	Anxiety Score
Disease Duration	**r=0.3, *p*<0.01**	*p*=0.7
Age	**r=0.2, *p*=0.01**	*p*=0.9

Discussion

The present study provides the evidence of high prevalence rates of depression and anxiety symptoms among patients with HF. More than two third of patients showed depression symptoms while more than one third of patients displayed anxiety symptoms. A positive correlation was found between disease duration and depression score. Comorbid diseases didn't affect depression scores. There was significant relationship between regular physical activity and lower depression and anxiety scores. Advanced NYHA classes (III and IV) was related with high depression and anxiety scores.

The prevalence of depression in patients with HF is highly variable and ranges from 10% to 60% in the literature [4-7]. A study from Turkey revealed also 52% ratio of depression in chronic heart failure [11]. This variability can be attributed to measurement methods for symptoms of depression.

In this study, a frequently used scale in health care was performed and the rate of depression symptoms was fairly high in the study population. Many studies and reviews clearly showed that depression in patients with HF is independent predictor of mortality [6, 7, 12]. Moreover, it has been proposed that depressive symptoms should be evaluated as a cardiac risk factor as it is not only associated with morbidity, also associated with HF development and progression [13, 14]. Daskalopoulou et al. [15] and White et al. [16] displayed in their study that presence of depression in healthy adults was associated with 20% risk of development of heart failure in following years. As stated in the literature, depression in patients with HF was found to be associated with decreased quality of life, frequent hospitalization, treatment adherence failure, poor cardiac function, increased risk of cardiac events, habituation of high risk behavior, difficulties with self care [7, 13, 17].

The treatment of depression might be one of main cores in standard care of patients with HF. Blumenthal et al. [18] demonstrated in their trial that regular physical activity (aerobic exercise) 3 times in a week for 3 months were enough to decrease the depression symptoms in patients with HF. Several studies in literature focused on effect of exercise on depression symptoms and showed positive benefits [19-21]. Many major insurance companies also reimburse cardiac rehabilitation, irrespective of type or severity of HF in the United States of America [22]. Other treatment modalities for depression are behavioral therapy, psychological therapy and pharmacological therapy [17, 23].

We revealed that more than one third of patients with HF had anxiety symptoms. In the literature, it has been demonstrated that the prevalence of anxiety symptoms may be as high as 50% in patients with HF [6]. Although it has not been clearly proven that anxiety can increase mortality in these patients, most evidence suggests that anxiety may cause adverse outcomes in patients with HF [7, 24]. Therefore, treatment options might be evaluated for patients with HF showing anxiety symptoms [13].

Co-morbid diseases are also a challenging problem in patients with HF. Dei Cas et al. (2015) [25], reported an approximate rate of 24% to 40% of diabetes in patients with CHF. We also found a high prevalence of concomitant diabetes mellitus (45%). It might be speculated that existence of co-morbid diseases is a risk factor for having psychological symptoms in the patients suffering from HF. However, the mean score of depression and anxiety did not differ between patients with and without concomitant disease (e.g. DM, asthma, hypothyroid) (p=0.56, p=0.25, respectively).

Another problem affecting life quality of patients with HF is sleep quality. In a study [26], it was indicated that sleep disturbances rate was in a wide range from 10% to 70% in patients with HF and it was found to be associated with lower quality of life and functional performance. Suna et al. [27] (2014), displayed an improved sleep quality after 3 months of regular physical activity. In our study, we found that patients sleeping less than 6 hours had more depressive and anxiety symptoms. We didn't measure the sleep quality, however sleep duration is related to sleep quality. Therefore, sleep duration and quality might be focused on for patients' psychological well being.

Depression and anxiety scores in patients with HF dramatically increased as the NYHA class increased. NYHA classes indicate the functional capacity of a patient and can predict

the prognosis and risk of cardiovascular events [28].

Our study has several limitations; first, the cross-sectional design of the study does not allow generalization of our findings. Thus, further longitudinal studies are needed. Secondly, our study sample was not large enough to draw definitive conclusions from the results. Thirdly, as this was a self-report inquiry, some information given by patients might be incomplete or inexact. Lastly, adding a control group of another chronic disease might have strengthened our findings. Additionally it should be kept in mind that the effect of the management of depression and anxiety on clinical outcomes was out of the scope of this study.

In conclusion, the high rate of depression and anxiety symptoms among patients with heart failure is an alarming situation. Our findings are consistent with other studies and emphasize the urgent need for universal diagnostic tools and treatment guidelines for psychological symptoms of these patients. Concomitant disease such as diabetes mellitus and risk factors that diminish life quality such as sleep disorders and absence of physical exercise might also be screened. Further studies including psychiatric interviews can guide patients into therapy of depression and anxiety symptoms.

Conflict of interest: No conflict of interest was declared by the authors.

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Contributions of the authors to the article

O.O. and Y.Y. set up the main idea and hypothesis of the study. A.S.K., E.I.G. and B.K.A. developed the theory and edited the material method section. Z.Y. and I.B. made the evaluation of data in results section. The discussion part of the article was written by Y.Y., O.O. and Z.O. reviewed, made necessary corrections and approved. In addition, all authors discussed the entire study and approved its final version.