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Original Article

Factors influencing the anxiety and depression of patients with dilated cardiomyopathy

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Abstract: Aims: This study aimed to investigate the prevalence and related factors of anxiety and depression in patients with dilated cardiomyopathy (DCM). Materials and Methods: A total of 115 DCM patients were consecutively recruited into present study, and general information was recorded. Zung's self-rating anxiety scale (SAS) and self-rating depression scale (SDS) were used to evaluate the anxiety and depression of these patients. In addition, factors influencing the anxiety and depression were also analyzed in these patients. Results: Of 115 patients, 23.4% were identified as anxiety and 21.7% depression. The mental work, NYHA class, arrhythmia, high-sensitivity C-reactive protein, brain natriuretic peptide, hospitalization days and hospitalization cost were significantly related to the anxiety and depression in patients with DCM. Conclusion: DCM patients have a high prevalence of anxiety and depression. Patients with mental work, poor cardiac function and arrhythmia are susceptible to anxiety and depression.

Keywords: Dilated cardiomyopathy, anxiety, depression, self-rating anxiety scale, self-rating depression scale

Introduction

Dilated cardiomyopathy (DCM) is one of common cardiovascular diseases. In recent years, numerous studies reveal that cardiovascular diseases may cause or deteriorate anxiety and depression. Anxiety and depression may influence the condition of cardiovascular diseases and their therapeutic efficacy and further affect the prognosis of these patients [1]. However, few studies have been conducted to investigate the correlation of DCM with anxiety and depression. This study was undertaken to investigate the prevalence of anxiety and depression in DCM patients hospitalized in our department and explore factors influence anxiety and depression. Our findings may guide the therapy of DCM patients with anxiety and depression.

Materials and methods

General information

A total of 115 inpatients with DCM were recruited from our hospital from January 2008 to December 2012. There were 96 males and 19 females. The median age was 49.1 ± 7.9 years (range: 32-71 years). Inclusion criteria were as follows: 1) patients met the diagnostic criteria for DCM, and factors causing cardiac enlargement, arrhythmias and heart failure were excluded [2]; 2) Both male and female patients were recruited, and patients should be older than 18 years; 3) Informed consent was obtained from patients or their relatives before study. Exclusion criteria were as follows: 1) there were confusion or mental retardation; 2) there was intubation or communication obstacle due to deafness and/or dumbness; 3) there was a history of mental diseases.

Methods

General information was collected within 3 days after admission and included name, gender, age, education level, occupation, and degree of heart failure and arrhythmia. Echocardiography and detection of brain natriuretic peptide were performed in these patients after admission. The cardiac function was classified as grade I, II, III and IV according to the New York Heart Association's (NYHA) classification [3]. Patients with body mass index (BMI) of < 18.5 kg/m^2 was diagnosed with Low body

Table 1. General information of 115 patients with DCM

Variables	Number	Anxiety (%)	Depression (%)
Gender			
Male	96	23 (23.9)	21 (21.8)
Female	19	4 (21.1)	4 (20.1)
Age			
≤ 65 yr	65	14 (21.5)	15 (23.1)
> 65 yr	50	13 (26)	12 (24)
Education level			
≤ junior middle school	48	13 (27.1)	16 (33.3)*
> junior middle school	67	14 (20.9)	9 (13.4)
Occupation			
Physical work	60	12 (20)*	8 (13.3)*
Mental work	55	15 (27.2)	17 (30.9)
NYHA grade			
I	8	2 (25)*	3 (37.5)
II	29	4 (13.7)	5 (17.2)
III	34	5 (14.7)	6 (17.6)
IV	44	16 (36.4)	11 (31.8)
LVEF			
≥ 50%	35	4 (11.4)*	7 (20)
< 50%	81	23 (28.3)	18 (22.2)
Arrhythmia			
No	8	3 (37.5)	3 (37.5)
Yes	107	24 (22.4)	22 (20.5)
BMI			
Low body weight	43	14 (32.5)*	9 (20.9)
Normal body weight	39	7 (17.9)	8 (20.5)
Overweight	33	6 (18.1)	8 (24.2)

*$P < 0.05$.

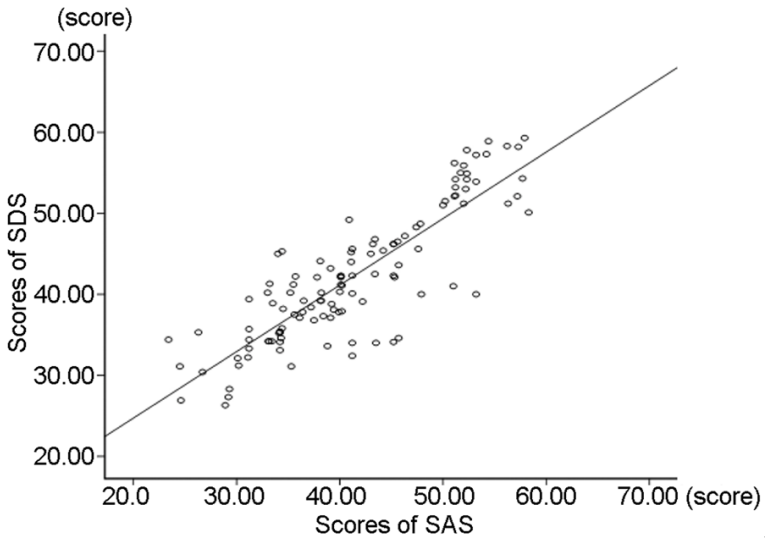

Figure 1. Correlation analysis chart between the scores of SAS and SDS. The correlation coefficient between SAS score and SDS score was 0.736 ($P < 0.01$).

weight and those with BMI of ≥ 25 kg/m^2 with overweight. Normal body weight was defined as BMI between 18.5 kg/m^2 and 25 kg/m^2 [4]. Self-Rating Anxiety Scale (SAS) and Self-Rating Anxiety Depression Scale (SDS) were employed to evaluate the anxiety and depression in these patients, respectively. The investigators explained the procedures and patients filled in the form. For patients with low education level, investigators filled in the form according to the patients' interpretation. The sum of score of each domain was obtained, and the sum multiplied by 1.25 was used as the standard score. The score of SAS of ≥ 50 was used as a threshold for determining anxiety; that of SDS of ≥ 50 for determining depression.

Statistical analysis

Statistical analysis was performed with SPSS version 19.0. Comparisons of quantitative data were done with t test between two groups and those of qualitative data with chi square test. The correlation of factors with anxiety and depression was evaluated with logistic regression analysis. A value of $P < 0.05$ was considered statistically significant.

Results

Prevalence of anxiety and depression and relevant factors

Of 115 patients, the mean SAS score was 37.56 ± 7.21 and the mean SDS score was 39.21 ± 8.45. In addition, 27 patients were diagnosed with anxiety (23.4%) and 25 with depression (21.7%). In DCM patients with mental work, the prevalence of anxiety and

Table 2. Factors associated with SAS score and SDS score in 115 patients

Variables	Mean ± SD	SAS score		SDS score	
		r	*P*	r	*P*
Age	56.21 ± 12.14	0.13	0.063	0.122	0.431
Left ventricular diastolic diameter (mm)	55.1 ± 8.9	-0.17	0.059	-0.13	0.29
High-sensitivity C-reactive protein (mg/L)	6.5 ± 5.1	16	0.028*	18	0.031*
Brain natriuretic peptide (ng/L)	891 ± 63.2	26	0.021*	28	0.031*
Hospital days (d)	13.21 ± 9.2	0.22	0.048*	0.34	0.042*
Medical cost (RMB)	6901 ± 299	0.35	0.041*	0.43	0.044*

*$P < 0.05$

Table 3. Multivariate analysis of factors related to anxiety of DCM patients

Variables	Partial regression coefficient	Standard error	Wald Chi-square test	*P*
NYHA grade	3.763	1.451	6.214	0.014
Arrhythmia	2.605	1.351	4.672	0.031
Mental work	2.643	1.171	4.553	0.036

Table 4. Multivariate analysis of factors related to depression of DCM patients

Variables	Partial regression coefficient	Standard error	Wald chi-square test	*P*
NYHA grade	2.295	0.896	6.001	0.013
Arrhythmia	2.063	0.882	4.384	0.032
Mental work	2.112	0.895	4.512	0.038

depression was 27.2% and 30.9%, respectively, which were significantly higher than those in patients with physical work (16% and 13.3%, respectively; $P < 0.05$). In patients with the education level of no higher than junior middle school, the prevalence of depression was 33.3%, which was higher than that in patients with higher education level (13.4%) ($P < 0.05$). Patients with left ventricular ejection fraction (LVEF) of < 50%, the prevalence of anxiety was 28.3%, which was markedly higher than that in patients with LVEF of ≥ 50% (11.4%) ($P < 0.05$). The prevalence of anxiety was significantly different among patients with different grades of cardiac function and different BMIs ($P < 0.05$). The general information of these patients is shown in **Table 1**.

Correlation between SAS score and SDS score

The correlation coefficient between SAS score and SDS score was 0.736 ($P < 0.01$) (**Figure 1**). In 115 patients, the correlation of factors with SDS score or SAS score was evaluated with Pearson correlation analysis. Results showed factors related to the SAS score or SDS score included high-sensitivity C-reactive protein, brain natriuretic peptide, hospital days and medical cost ($P < 0.05$) (**Table 2**).

Multivariate analysis

Depression served as a dependent variable and other factors as independent variables, followed by multivariate analysis. Results showed mental work, heart failure and arrhythmia were associated with anxiety and depression of DCM patients ($P < 0.05$) (**Tables 3** and **4**).

Discussion

DCM is a primary cardiomyopathy of unknown cause and is characterized by left and/or right ventricular enlargement with or without congestive heart failure. DCM patients usually have arrhythmia and the incidence of DCM is higher in males than in females. Usually, DCM shows gradual progression and DCM patients may die at any stage of DCM. The 5-year mortality of DCM patients is about 70% [5]. Anxiety and depression are common psychological disorders and they may exist independently or concomitantly. Severe DCM usually adds mental load and may cause symptoms of anxiety and depression which in turn affect the therapy of DCM and the prognosis of DCM patients [6-8].

In this study, we investigated the prevalence of anxiety and depression in DCM patients. Results showed DCM patients had a high prevalence of anxiety and depression. Of 115 patients with DCM, 23.4% were diagnosed with anxiety and 21.7% with depression, which were

consistent with findings from studies in which the anxiety and depression were investigated in patients with cardiovascular diseases [9]. Our results also revealed that the SAS score was related to the SDS score in DCM patients, suggesting that the anxiety and depression may exist concomitantly in DCM patients. This might be explained as that patients are afraid of the DCM itself and concern the recurrence of DCM, high medical cost, and loss of job, living activities and social and family support. After analyzing factors influencing the anxiety and depression in these patients, mental work, severe heart failure and arrhythmia were found to predict a high score of SAS and SDS. This implies that to actively improve the cardiac function and arrhythmia may reduce the incidence of depression and anxiety.

Mental and psychological disorders have a high prevalence in patients with cardiovascular diseases. From April 2004 to February 2005, the Department of Epidemiology in the School of Public Health of Fudan University conducted the Prevalence of Symptoms of Depression and/or Anxiety in urban non-psychiatric patients of China. Their results showed the prevalence of depression and anxiety was 22.8% and 70.9%, respectively, and higher in females than in males. However, they also found that the few patients were diagnosed with depression or anxiety (3.7% and 2.4%, respectively). Moreover, only 2.4% of patients received therapy for depression and/or anxiety [10]. Thus, physicians and nurses should emphasize the psychological disorders in patients with cardiovascular diseases. There is evidence showing that anxiety and depression are predictors of adverse cardiovascular events [11-14]. Studies have shown that anxiety and depression may increase the sympathetic tone and elevate the release of catecholamines, which may cause cardiac autonomic dysfunction, induce coronary artery spasm, increase the Q-T dispersion, reduces the heart rate variability (HRV) and decrease the magnitude of nighttime blood pressure reduction, causing following adverse effects: 1) induction of acute coronary events; 2) influence on the cardiac function and structure; 3) presence of fatal arrhythmia or sudden death [15]. To actively treat psychological disorders may improve the prognosis of cardiovascular disease patients. Treatments include non-pharmacological therapy and pharmacological therapy. Psychological intervention and sports rehabilitation can be used for non-pharmacological therapy. Benzodiazepines tricyclics (TcA), selective 5-HT reuptake inhibitors (ssRIs) and mixed preparations (deanxlt) have been used in the treatment of depression and/or anxiety (ssRIs and deanxlt are effective for both depression and anxiety) with high safety [15].

Our results show DCM patients have a high prevalence of anxiety and depression and there is interaction between anxiety and depression. To improve the understanding of anxiety and depression in medical staffs and to emphasize the treatment of psychological disorders during the therapy of physical diseases are likely to improve the quality of life and the prognosis of these patients.

Disclosure of conflict of interest

None.

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