Anxiety, depression, and associated factors among inpatients waiting for heart transplantation

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Background: Although heart transplants have become more common, little is known about the psychological status of patients waiting for a heart transplant.

Methods: Thirty-eight inpatients waiting for heart transplantation from October 2010 to December 2011 in a large general hospital in Shanghai were assessed by a psychiatrist using the Hamilton Depression Scale and the Hamilton Anxiety Scale at admission and weekly thereafter until the operation took place.

Results: The patients included 30 males and 8 females with a mean (sd) age of 44.7 (12.9) years who had been seriously limited due to their heart disease (i.e., Stage III heart disease) for a mean of 18.5 (24.0) months. Among them, 7.9% (3/38) were moderately or severely depressed and 47.4 % (18/38) had moderate or severe anxiety symptoms; only one (2.6%) had concurrent moderate to severe anxiety and depression. There was a slight but statistically significant increase in both anxiety and depressive symptoms during the first week of hospitalization. In the stepwise backward logistic regression, the reported level of anxiety was significantly associated with the duration of Stage III heart disease (less anxiety in those with longer Stage III disease), prior treatment in an intensive care unit (associated with less anxiety), age (anxiety increases with age), and prior emergency cardiac treatment (associated with greater anxiety). Multivariate linear regression analysis also found that longer duration of Stage III disease and higher educational status were associated with reporting less depressive symptoms, but a longer total duration of heart disease was associated with reports of more depressive symptoms.

Conclusion: Unlike reports from other countries, we found that anxiety symptoms are more prevalent and more severe than depressive symptoms among inpatients waiting for heart transplantation in Shanghai. There is an inverse relationship between duration of disabling illness and the preoperative self-reports of anxiety and depressive symptoms: those who had had Stage III disease for over a year reported less severe anxiety and depressive symptoms than those who had had Stage III disease for less than a year.

1. Introduction

Many factors are associated with survival after heart transplantation. Over a decade ago, Dew and colleagues[1] conceptualized the post-transplant status of patients as a series of concentric circles. The inner core of these circles is the patient's physical functioning and the outer circles are his or her psychological status, behavioral styles, and social relationships. Problems in any circle could cause a significant decrease in quality of life. Grady and colleagues[2] found that the five most important predictors of overall quality of life after heart transplantation were presence of depressive symptoms, a happy disposition, social interactions, satisfaction with emotional support, and an interest in life.

Previous studies report that pre-transplant psychological status predicts post-transplant psychological status, length of hospitalization, and the success of the surgery.[3] Thus, understanding the psychological status in patients waiting for a heart transplant can help doctors predict their short-term and long-term recovery after surgery as well as their compliance with the requirements of post-surgery rehabilitation.[4] Given the high demand for organ donors and the huge financial and emotional input of patients and their families before and after transplantation, evaluating pre-transplantation psychological status is one avenue to improve the cost-benefit of this expensive intervention. There have been a few studies on the pre-transplant psychological status

of patients from other countries; most of them focus on assessment of the quality of life using self-rating scales. There have been no prior reports on the psychological status of patients waiting for a heart transplant in China.[5-7] The current study aims to assess anxiety symptoms, depressive symptoms, and associated factors among in-patients waiting for heart transplantation.

2. Methods

2.1 Subjects

As shown in the flowchart for the study (Figure 1), among 65 patients who had registered for a heart transplant, the study participants were the 38 patients who were pre-operatively admitted to the Cardiac Surgery inpatient ward of Zhongshan Hospital in Shanghai from October 2010 to December 2011. Among them, 30 (78.9%) were males and eight (21.1%) were females. Their ages varied from 19 to 64 with a mean (sd) of 44.7 (12.9) years. All of them were of Han ethnicity. Among them 7 (18.4%) had completed middle school, 21 (55.3%) had completed high school or technical school, and 10 (26.3%) had completed college. Six (15.8%) had never married and the remaining 32 (84.2%) were married.

Their primary diagnoses were dilated cardiomyopathy (*n*=33), peripartum cardiomyopathy (*n*=1), congenital heart disease (*n*=2), restrictive cardiomyopathy (*n*=1), and cardiac tumor (*n*=1). None of them had a history of depression, anxiety disorder, alcohol dependence, dependence on other psychoactive substances, or family history of mental disorders. The mean (sd) time interval they had been continuously assessed as grade III NYHA (New Your Heart Association)[8] cardiac functioning prior

Figure 1. Flowchart of the study

65 patients who registered for heart transplan-tation in the Cardiac Surgery Ward of Zhongshan hospital from October 2010 to December 2011

27 were not hospitalized
- 5 died
- 2 went to another hospital
- 8 not suitable for surgery
- 12 remain on waiting list

38 patients admitted for heart transplantation from October 2010 to December 2011

Basic demographic information collected with-in 3 days of admission; Hamilton Depression Scale (HAMD) and Hamilton Anxiety Scale (HAMA) assessment completed on admission and weekly until surgery

to hospitalization was 18.5 (24.0) months. Grade III patients have marked limitation in activity due to cardiac symptoms, even during less-than-ordinary activity such as walking short distances (20–100 m); they are comfortable only at rest.

The current study was approved by the ethics committee of Zhongshan Hospital. Oral informed consent was obtained from all patients.

2.2 Assessment

All participants were interviewed by one psychiatrist. Demographic variables collected included gender, age, educational level, religion and marital status. Several variables about the heart condition were also obtained: the number of prior hospital admissions since being assigned grade III in cardiac functioning, the number of times receiving emergency cardiac treatment after being assigned grade III in cardiac functioning, the number of intensive care unit (ICU) visits after being assigned grade III in cardiac functioning, current status of cardiac failure, and the number of current complications (e.g., arrhythmias, clotting abnormalities, pulmonary hypertension, anemia, diabetes, liver disease, kidney disease, etc.).

The 17-item Hamilton Depression Scale (HAMD)[9] was used to assess the severity of depressive symptoms. HAMD has been found to have high reliability (*r* = 0.88-0.99) and validity (*correlation coefficient for HAMD and clinical changes* =0.26) in Chinese populations.[9] The HAMD score was used to categorize participants into 'non-depressed' (HAMD score <7), 'mildly depressed' (HAMD score between 7 and 17), 'moderately depressed' (HAMD score between 18 and 24), and 'severely depressed' (HAMD score ≥24) groups.

The Hamilton Anxiety Scale (HAMA)[10] was used to measure the severity of anxiety symptoms. It also has good reliability (*r*=0.93) and validity (correlation coefficient for HAMA score and severity of disorder=0.36).[10] The HAMA score is also subdivided into two subscale scores, the 'psychological anxiety' subscale score and the 'somatic anxiety' subscale score. The total HAMA score was used to categorize participants into 'non-anxious' (HAMA score <7), 'mildly anxious' (HAMA score between 7 and 13), 'moderately anxious' (HAMA score between 14 and 20), and 'severely anxious' (HAMA score ≥21) groups. Comorbid depressive and anxious status was defined as concurrent moderate or severe depressive and anxious status.

The assessment of depression and anxiety status was conducted within three days of admission and repeated weekly until the surgery. One patient was evaluated only once, 36 patients were evaluated twice, and one patient was evaluated three times. Data from the last evaluation were used in the analysis because depressive and anxiety symptoms can change during hospitalization and the status immediately before the surgery was the most important in terms of long-term prediction of outcomes.
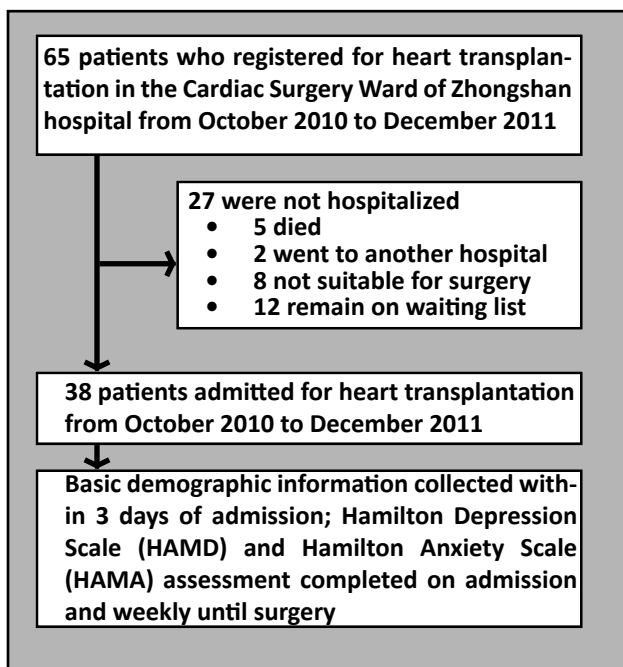
Table 1. Hamilton Anxiety Scale (HAMA) scores of 38 inpatients waiting for heart transplantation

	mean	sd	range
Total score	13.29	6.33	4-23
Psychological anxiety subscale score	6.50	3.47	2-12
Somatic anxiety subscale score	6.89	3.09	1-13
ITEM SCORES			
1. Anxiety	1.18	0.51	0-2
2. Tension	0.97	0.72	0-2
3. Fears	0.84	0.75	0-2
4. Insomnia	1.00	0.84	0-2
5. Memory or attention problems	0.95	0.70	0-2
6. Depressed mood	1.08	0.59	0-2
7. Psychomotor symptoms	0.61	0.64	0-2
8. Sensory symptoms	0.87	0.62	0-2
9. Cardiovascular symptoms	1.47	0.80	0-2
10. Respiratory symptoms	0.84	0.75	0-2
11. Gastrointestinal symptoms	1.03	0.68	0-2
12. Genitourinary symptoms	0.84	0.72	0-2
13. Autonomic nerve system symptoms	0.84	0.72	0-2
14. Interviewer's observation	0.87	0.78	0-2

2.3 Statistical analyses

Data were analyzed using SPSS software (version 16.0). Mean scale scores of different groups of patients were compared using t-tests and F-tests. The correlation of HAMD and HAMA was assessed using Pearson correlation coefficients. The change in HAMA and HAMD from admission to the first week post-admission (in 37 patients who have two preoperative evaluations) was assessed using paired t-tests and the concordance of the first and second results are assessed using intraclass correlation coefficients (ICC). Multivariate linear regression was used to estimate the association between HAMA scores, HAMA subscale scores and HAMD scores, and other variables assessed in this study.

None of the participants had a history of mental disorder or alcohol dependence, and none of them had a family history of mental disorders, so these variables were not included in the analysis. Only one respondent reported religious beliefs and only one participant did not have cardiac failure at the time of hospitalization, so these variables were also excluded from the analyses. The numbers of cases in some of the categories of the categorical variables was quite small, so most categorical variables (except educational level) were collapsed into dichotomous variables in the analyses. The duration of being classified as Stage III heart functioning prior to hospitalization was not normally distributed, so this variable was also dichotomized at the median value (12 months). All statistical tests were two-sided and the level of significance was set at 0.05.

3. Results

3.1 Pre-transplantation depression and anxiety symptoms

The results for the final preoperative evaluation of the HAMA for all 38 patients are shown in Table 1. The mean (sd) total HAMA score was 13.29 (6.33) with a range of 4 to 23. Among the participants, 9 (23.7%) were classified as 'non-anxious'; 11 (28.9%) as 'mildly anxious'; 10 (26.3%) as 'moderately anxious'; and 8 (21.1%) as 'severely anxious'. The total HAMD score ranged from 4 to 28 with a mean (sd) of 8.16 (5.59) among the 38. Among these respondents, 17 (44.7%) were classified as 'non-depressed'; 18 (47.4%) as 'mildly depressed'; 2 (5.3%) as 'moderately depressed'; and one (2.6%) was 'severely depressed'. One (2.6%) patient had both concurrent moderate or severe depressive and anxiety symptoms before the surgery. The correlation of the HAMD total score with the HAMA total score, HAMA psychological symptom subscale score and HAMA somatic symptom subscale scores was 0.18 (p=0.291), 0.04 (p=0.792), and 0.17 (p=0.301), respectively. The correlation of the HAMA somatic and psychological subscale scores was 0.77 (p<0.001).

As shown in Table 2, among the 37 patients who were evaluated both at the time of the preoperative admission and one week after admission, there was a slight but statistically significant increase both in the level of anxiety symptoms and in the level of depressive symptoms over the first week of admission. However, as shown by the high values for the intraclass correlation coefficients (ICCs), the first and second evaluations of these measures were highly concordant.

Table 2. Change in level of anxiety and depression over the first week of inpatient admission among 37 patients waiting for a cardiac transplant

	score on admission mean (sd)	score one week after admission mean (sd)	paired t-test	p-value	Intraclass correlation coefficient (ICC)
Hamilton Anxiety Scale (HAMA) total score	13.28 (6.33)	13.89 (6.19)	-3.31	0.002	0.984
HAMA psychological symptom subscale score	6.89 (3.09)	7.07 (3.11)	-2.89	0.006	0.992
HAMA somatic symptom subscale score	6.50 (3.47)	6.84 (3.53)	-2.83	0.007	0.977
Hamilton Depression Scale (HAMD) total score	8.16 (5.06)	8.42 (4.98)	-2.93	0.006	0.994

3.2 Univariate relationship of demographic and cardiac factors to anxiety and depressive symptoms

The results of the univariate comparison of the anxiety and depressive symptoms scores at the time of the last preoperative evaluation with the demographic and cardiac characteristics of the patients are shown in Table 3. The three measures of anxiety symptoms were all significantly related to the duration of being seriously ill with heart disease and with the number of prior hospitalizations for heart disease. Patients who had had three or more hospitalizations and those who had been classified as Stage III cardiac functioning for more than a year were substantially less anxious than patients who had had less than three hospitalizations and those who had been seriously ill for less than one year. The somatic symptom subscale score of the HAMA was also significantly associated with prior treatment in an intensive care unit: patients who had previously been treated in an intensive care unit were much less anxious than those who had not. The only variable that was significantly related to the level of depressive symptoms was the educational status of the respondent; those with a higher level of education had more server depressive symptoms.

3.3 Multivariate regression analysis of the HAMA and HAMD scores

Multivariate regression analyses were conducted with total HAMA score and total HAMD score as the dependent variables and both demographic and cardiac variables as the independent variables, including gender, age, marital status, educational level (three levels), total duration of heart disease, duration of being seriously disabled (i.e., in Stage III cardiac disease, dichotomized), number of hospitalizations (dichotomized), prior receipt of emergency treatment, prior treatment in an ICU, and duration of current hospitalization. The full regression models are shown in Tables 4 and 5. These models accounted for a substantial proportion of the variance in the HAMA total score (R^2=0.80) and in the HAMD total score (R^2=0.60).

Table 4 shows that the only variable that was statistically significant when all the variables were forced into the model was the duration of Stage III disease. After adjusting for all the other variables, persons who had Stage III heart disease for more than one year had significantly *lower* scores on HAMA than those who had had Stage III disease for less than one year. Other variables that showed a trend (i.e., *p*<0.20) included age (higher age was associated with greater anxiety), educational level (persons with college education had greater anxiety than those with elementary education), female gender (women were more anxious than men), and the presence of medical complications (those with complications had *less* severe anxiety). Stepwise backward regression identified four variables that were independently and significantly associated with the HAMA total score: duration of Stage III disease (less anxiety in those with longer Stage III disease), prior treatment in an ICU (associated with less anxiety), age (anxiety increases with age), and prior emergency cardiac treatment (associated with greater depression).

Table 5 shows that after adjusting for all the other variables in the model, persons with more than one year of serious disability due to their cardiac disease (i.e., pre-hospitalization time interval in Stage III cardiac disease > 1 year) are also likely to report less severe depressive symptoms than those who have been seriously disabled by their cardiac problems for less than one year. Interestingly, the total duration of heart disease (including the period prior to serious disability) had a significant positive association with depression, that is, those will a longer total duration of cardiac problems had higher levels of depressive symptoms. There was also a trend (i.e., *p*<0.20) for persons who had graduated from college to have higher reported levels of depression than those who only had an elementary school education. These three factors remained significantly associated with the total HAMD total score in the stepwise backwards regression model.

Table 3. Relationship of demographic and cardiac variables to mean (sd) severity of anxiety and depressive symptoms in 38 inpatients scheduled for cardiac transplantation

	Hamilton Anxiety Scale (HAMA) total score	HAMA psychological symptom subscale score	HAMA somatic symptom subscale score	Hamilton Depression Scale (HAMD) total score
Age (r, p-value)	-0.06 (0.739)	0.00 (0.994)	-0.03 (0.842)	-0.27 (0.098)
Duration in Stage III (r, p-value)	**-0.38 (0.019)**	-0.30 (0.072)	**-0.42 (0.009)**	-0.26 (0.122)
Total duration of disease (r, p-value)	-0.26 (0.110)	-0.16 (0.341)	-0.31 (0.061)	-0.09 (0.608)
Time in hospital before last test (r, p-value)	0.02 (0.904)	0.12 (0.459)	-0.04 (0.823)	0.00 (0.992)
Gender				
Male (*n*=30)	12.7 (6.56)	6.7 (3.18)	6.1 (3.63)	8.3 (5.65)
Female (*n*=8)	15.5 (5.16)	7.5 (2.82)	8.1 (2.30)	7.5 (1.51)
t-test (p-value)	-1.11 (0.272)	-0.62 (0.540)	-1.52 (0.138)	0.41 (0.685)
Marital status				
unmarried (*n*=6)	14.5 (5.75)	7.3 (2.94)	6.8 (3.31)	10.6 (6.12)
married (*n*=32)	13.1 (6.50)	6.8 (3.16)	6.4 (3.54)	7.7 (4.80)
t-test (p-value)	0.51 (0.617)	0.37 (0.710)	0.25 (0.802)	1.34 (0.189)
Educational status				
Middle school (*n*=7)	12.4 (3.65)	6.6 (1.99)	6.3 (2.43)	6.6 (2.30)
High/technical school (*n*=21)	12.5 (7.03)	6.7 (3.51)	6.0 (3.77)	7.1 (3.54)
College (*n*=10)	15.5 (6.22)	7.5 (2.95)	7.6 (3.47)	11.4 (7.60)
F-test (p-value)	0.61 (0.835)	0.87 (0.571)	0.55 (0.853)	**2.62 (0.021)**
Number of prior hospitalizations				
0-2 (*n*=18)	16.39 (5.91)	8.33 (2.83)	8.28 (3.39)	9.11 (6.21)
3+ (*n*=20)	10.50 (5.43)	5.60 (2.78)	4.90 (2.73)	7.30 (3.70)
t-test (p-value)	**3.20 (0.003)**	**3.00 (0.005)**	**3.40 (0.002)**	1.11 (0.276)
Number of prior emergency treatments				
0 (*n*=29)	13.31 (6.74)	6.86 (3.30)	6.72 (3.64)	7.69 (5.09)
1-3 (*n*=9)	13.22 (5.14)	7.00 (2.45)	5.78 (2.91)	9.67 (4.95)
t-test (p-value)	0.04 (0.972)	-0.12 (0.919）	0.71 (0.482)	-1.03 (0.312)
Number of medical complications				
0 (*n*=29)	13.31 (6.74)	6.86 (3.30)	6.72 (3.64)	7.69 (5.09)
1 or 2 (*n*=9)	13.22 (5.14)	7.00 (2.45)	5.78 (2.91)	9.67 (4.95)
t-test (p-value)	0.04 (0.972)	-0.12 (0.919）	0.71 (0.482)	-1.03 (0.312)
Prior treatment in intensive care unit				
No (*n*=29)	14.3 (6.41)	7.3 (3.22)	7.3 (3.42)	8.1 (5.13)
Yes (*n*=9)	10.1 (5.13)	5.6 (2.30)	4.0 (2.34)	8.3 (5.12)
t-test (p-value)	1.77 (0.085)	1.51 (0.139)	**2.67 (0.011)**	-1.12 (0.907)
Duration of Stage III cardiac functioning				
<12 months (*n*=18)	17.44 (5.11)	8.44 (2.68)	8.89 (2.90)	9.50 (6.10)
>12 months (*n*=20)	9.55 (4.86)	5.50 (2.80)	4.35 (2.37)	6.95 (3.63)
t-test (p-value)	**4.88 (<0.001)**	**3.30 (0.002)**	**5.30 (<0.001)**	1.58 (0.122)

Table 4. Multivariate linear regression analysis of the total score of the Hamilton Anxiety scale (HAMA) with demographic and cardiac status among 38 inpatients waiting for heart transplantation[a]

Items	Regression coefficient	sd	Standardized coefficient	t	p	95% CI of coefficient
DEMOGRAPHIC VARIABLES						
Female gender	3.47	2.34	0.23	1.48	0.151	-1.35 ~ 8.29
Age	0.23	0.11	0.46	2.02	0.054	-0.01 ~ 0.46
Married	-2.35	3.45	-0.14	-0.68	0.502	-9.46 ~ 4.76
Educational status						
Middle and high school v. elementary school	-0.36	2.39	-0.03	-0.15	0.882	-5.28 ~ 4,56
College v. elementary school	5.95	3.02	0.42	1.97	0.060	-0.27 ~ 12.18
CARDIAC VARIABLES						
Months total duration of cardiac disease (month)	0.01	0.01	0.15	0.85	0.401	-0.01 ~ 0.03
≥ 12 months Stage III heart disease	-9.50	1.81	-0.76	-5.26	**<0.001**	-13.22 ~ 5.78
3+ prior hospitalizations for cardiac problems	-1.56	2.01	-0.12	-0.78	0.445	-5.69 ~ 2.58
Has medical complications	-4.00	2.73	-0.22	-1.46	0.156	-9.63 ~ 1.64
Ever received emergency cardiac treatment	3.08	2.59	0.21	1.19	0.245	-2.25 ~ 8.42
Ever been in intensive care unit for cardiac problem	-3.05	2.63	-0.21	-1.16	0.258	-8.47 ~ 2.38
Time of current hospitalization at time to test	-0.65	0.55	-0.21	-1.18	0.249	-1.79 ~ 0.49

[a] R^2 for the full model=0.795

Table 5. Multivariate linear regression analysis of the total score of the Hamilton Depression scale (HAMD) with demographic and cardiac status among 38 inpatients waiting for heart transplantation[a]

Items	Regression coefficient	sd	Standardized coefficient	t	p	95% CI of coefficient
DEMOGRAPHIC VARIABLES						
Female gender	-0.03	2.64	-0.00	-0.01	0.993	-5.46 ~ 5.41
Age	0.02	0.13	0.04	0.12	0.905	-0.25 ~ 0.28
Married	-0.43	3.89	-0.03	-0.11	0.912	-8.45 ~ 7.58
Educational status						
Middle and high school v. elementary school	-2.17	2.69	-0.22	-0.81	0.427	-7.72 ~ 3.37
College v. elementary school	4.54	3.41	0.40	1.33	0.194	-2.47 ~ 11.55
CARDIAC VARIABLES						
Months total duration of cardiac disease (month)	0.03	0.01	0.53	2.16	**0.041**	0.00 ~ 0.05
≥ 12 months Stage III heart disease	-4.40	2.04	-0.44	-2.16	**0.041**	-8.59 ~ -0.21
3+ prior hospitalizations for cardiac problems	-1.25	2.26	-0.13	-0.55	0.587	-5.91 ~ 3.41
Has medical complications	-1.80	3.08	-0.15	-0.57	0.573	-8.11 ~ 4.59
Ever received emergency cardiac treatment	-0.60	2.92	-0.05	-0.20	0.840	-6.61 ~ 5.42
Ever been in intensive care unit for cardiac problem	0.44	2.97	0.04	0.15	0.882	-5.67 ~ 6.55
Time of current hospitalization at time to test	-0.54	0.62	-0.22	-0.87	0.394	-1.83 ~ 0.74

[a] R^2 for the full model=0.604

4. Discussion

4.1 Main findings

We found that 47.4% (18/38) of inpatients waiting for heart transplantation had moderate to severe anxiety symptoms and that 7.9% (3/38) of them were moderately or severely depressed. Only one person (2.6%) had co-morbid depression and anxiety. The few available studies about the pre-transplantation psychosocial status of patients waiting for heart transplantation report high levels of stress and an inverse relationship between quality of life and reported levels of depressive symptoms.[10] Unlike previous studies that only include pre-transplantation cardiac patients still waiting at home, we found that anxiety was a more prominent symptom than depression in our hospitalized patients. This may be because pre-transplantation hospitalization following the (often) long wait on the waiting list gives the patient hope that improvement in their situation is imminent and, thus, decreases their depressive affect. Another explanation for this difference, suggested in our previous work,[11,12] is that Chinese patients preferentially report anxiety rather than depression because they consider reports of depressive symptoms an acknowledgement of psychological weakness. Finally, pre-operation anxiety is common among patients waiting for surgery, particularly in those for whom a major operation is imminent, so this may have magnified any preexisting anxiety symptoms.

There are some reports about the pre-operation psychological status of patients waiting for transplantation of other organs. In a sample of 518 patients waiting for renal transplantation, Kuntz and colleagues[13] found that only 15.1% reported depressive symptoms and 7.6% reported anxiety symptoms; the authors considered these results under-estimations, possibly due to the tendency of patients to present themselves positively. Yohannes and colleagues[14] reviewed relevant literature and found that the reported prevalence of depressive symptoms and anxiety symptoms in patients with chronic obstructive pulmonary disease was 8 to 80% and 6 to 74%, respectively; and in patients with chronic heart failure the prevalence was 10 to 60% and 11 to 45%, respectively. Although these studies use different methodology and different symptom scales, they are uniform in indicating that depression is a more common and more severe symptom in these pre-transplantation patients than anxiety. Given that most of these studies sampled patients on waiting lists – not those who were just about to get their operation – it may not be appropriate to compare these results to ours. The relative role of cultural values as an explanatory variable of these differences in the psychological profile of pre-operative patients will not be clarified until studies from China and those from other countries use comparable subjects; either those on long waiting lists for organs or those who are just about to receive the operation after a prolonged wait.

Our previous work[12] found that anxiety symptoms are prevalent before the cardiac transplantation but depressive symptoms become more common after the transplantation. Those with very high levels of anxiety pre-operatively are likely to have a short post-surgery survival (to be reported in a subsequent paper). Among those who survive the post-operative period, the resolution of the symptoms of cardiac failure may eliminate some of the organic causes of anxiety symptoms while the reality of repaying huge medical costs and adjusting to a lifetime of follow-up may depress their mood.

The results of multivariate analysis showed an inverse association between the duration of severe, disabling heart disease (i.e., Stage III disease) and both the HAMA and HAMD total scores. The most likely explanation for this inverse relationship is that patients who have been seriously disabled for prolonged periods (typically with multiple hospitalizations and other interventions) adapt more quickly and are less distressed by a potentially curative hospitalization than those with shorter periods of serious disability who have less experience with hospitalization and other medical interventions.

4.2 Limitations

The vast majority (97%) of patients in this study reported symptoms of chronic cardiac failure including palpitations caused by arrhythmias, chest pains, dyspnea, pressure on the chest induced by ascites and pleural effusion, and insomnia. These symptoms may be confused with the somatic symptoms of anxiety and lead to artificially high HAMA and HAMD scores. Thus, caution is needed when comparing the reported levels of depressive and anxiety symptoms in the study with those reported in studies of patients with other conditions.

The sample size of this study is relatively small (*n*=38), which leads to low statistical power that may explain our failure to find many factors that were significantly associated with the levels of self-reported anxiety and depression. For example, clinical experience suggests that younger patients and those with a rapidly progressive condition tend to be more anxious, but the results of the study did not confirm this. The small size of the study also made it impossible to adjust the results for several potential confounding variables, such as medications, comorbid diseases, and so forth.

It also appears likely that the psychological status of pre-transplant patients may be different while at home on the waiting list and at the time of hospitalization immediately prior to the operation. Future studies need to follow patients over time to identify different trajectories of anxiety and depressive symptoms; these different trajectories may be related to different long-term outcomes.

4.3 Significance

This study assessed the psychological status of cardiac patients who had been hospitalized in preparation for a heart transplantation using psychiatrist-administered assessment tools that have good validity and reliability

in China. The results showed that anxiety was more prominent than depression among these patients and that the severity of both anxiety and depressive symptoms was inversely associated with the duration of having Stage III cardiac disease, that is, with the time during which the cardiac disease resulted in serious disability. Future studies with larger samples that assess patients at different stages of the transplantation process are needed to identify trajectories of anxiety and depressive symptoms that are associated with the long-term outcomes of transplant patients.

Conflict of interest

Authors declare no conflict of interest.

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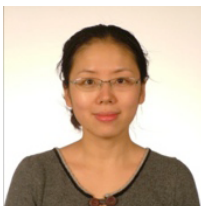
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•论著•

心脏移植住院等待者的焦虑抑郁状态及相关因素

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摘要

背景：

方法： 2010　10　　2011　12
38

结果： 　　　　　30　　　8　　　　　　　44.7(12.9)　　　　　　　　　　　　　　　　　　(　　　　III
　)　　　　　185 (240)　　　　　　　　　　　　　　　　　7.9%(3/38)
　　　　　47.4%(18/38)　　　　　　　　　　　　　　　1 (2.6%)
　　　　　　　　　　　　logistic
　　　　　III
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　III

结论：

　　　　III　　　1　　　　　　　　　　　　　　　　　1