

Jean-Marc Triffaux
Jacques Wauthy
Adelin Albert
Jean Bertrand
Raymond Limet
Jean-Claude Demoulin
Jean-Pol Dozot
Marc Anseau

Psychological distress of surgical patients after orthotopic heart transplantation

Received: 30 June 2000
Revised: 30 October 2000
Accepted: 14 August 2001

J.-M. Triffaux (✉) · J. Wauthy · J.-P. Dozot
M. Anseau
Department of Psychiatry, Psychological,
and Psychosomatic Medicine,
CHU Sart Tilman B 35,
University of Liège, 4000 Liège, Belgium

A. Albert
Department of Biostatistics,
CHU Sart Tilman B 35,
University of Liège, 4000 Liège,
Belgium

J. Bertrand
Hôpital de Jour Universitaire "La Clé",
153 Blvd. de la Constitution, 4020 Liège,
Belgium

R. Limet · J.-C. Demoulin
Department of Heart Surgery,
CHU Sart Tilman B 35,
University of Liège, 4000 Liège,
Belgium

Corresponding address: J.-M. Triffaux,
Hôpital de Jour Universitaire "La Clé",
153 Blvd. de la Constitution, 4020 Liège,
Belgium, e-mail: psychiatrie@ulg.ac.be,
Tel.: + 32-4-3426596, Fax: + 32-4-3422215

Abstract Orthotopic heart transplantation (OHT) is a major surgical intervention inducing distress and anxiety. Psychological problems after OHT have been described in many studies. Little is known, however, about the relationship between the psychological state of the patient and time after surgery. The present study involved 41 consecutive OHT patients that underwent transplantation from January 1991 to December 1992, with a retrospective review of pretransplant psychiatric evaluations to define a *Diagnostic and Statistical Manual of Mental Disorders, 3rd edn., revised* (DSM III-R) Axis I diagnosis. Patients completed the *Beck Depression Inventory* (BDI-13), *Spielberger's State Trait-Anxiety Inventory* (STAI-Y), and the *General Health Questionnaire* (GHQ-28) between 1 and 41 months after transplantation. For comparison, 29 presumably healthy volunteers were given the same questionnaires. The study confirms the occurrence of abnormal psychological scores in the OHT group as compared to the reference population.

Psychological scores, however, do not appear to be related to the time they were recorded after surgery.

Keywords Anxiety · Depression · General Health · Heart transplantation · Psychopathology.

Abbreviations BDI Beck Depression Inventory · DSM III-R Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised · GHQ General Health Questionnaire · OHT orthotopic heart transplantation · STAI State Trait-Anxiety Inventory

Introduction

The wait for orthotopic heart transplantation (OHT) in patients with terminal cardiac insufficiency is known to generate marked psychological problems. Several studies have reported anxiety, depression, and psychosocial distress in patients waiting for a donor [6, 23, 27, 28, 30].

Various authors [5, 16, 20, 22] have described an improvement of presurgical psychological scores of OHT patients after heart transplantation, while others [9, 11] have reported an amelioration of the quality of life. Dew et al. [7] in their study found that anxiety and depression levels rise in the early post-transplant period, but rapidly decrease over time in two thirds of the pa-

tients. Yet, preoperative psychological disorders may subsist and influence the patient's outcome after transplantation [19], in particular anxio-depressive symptoms [2]. Moreover, psychological problems can be related with a hospital stay for at least 1 year after transplantation. In the postoperative phase, changes in the quality of life can vary depending on the severity of the illness before surgery [17]. Such changes affect memory improvement [21] and deterioration of the relationship with spouse within a period of 1–5 years after surgery [4] or of coping strategies. Alteration of coping strategies, however, has been reported to be independent of the time elapsed since transplantation [13]. Nonetheless, in the long term (9–13 years following OHT), the psychological condition of surviving patients has been shown to be comparable to that of the general population [12]. Thus, despite a marked improvement in the general condition of OHT patients just after surgery, many studies have reported the incidence of psychological problems in the postoperative period.

Nowadays, the majority of patients in most centers is included in psychological programs during the transplant process. However, the present cross-sectional study aimed to analyze the postoperative evolution of psychological scores in OHT patients who received only routine care (without specific psychological aid before and after surgery) and to compare these scores with those of an age- and gender-matched group of presumably healthy individuals.

Patients and methods

Subjects and procedure

Forty-one consecutive patients (31 men and 10 women), aged 57.2 ± 9.2 years (range: 29–67 years), who underwent OHT from January 1991 to December 1992 at the University Hospital of Liège (Belgium) were included in the study. They were evaluated for depression, anxiety, and general health in the postsurgical phase. The evaluation took place an average 18 ± 10 months after OHT (range: 1–41 months). None of these patients had received psychotherapy or psychological intervention before, during, or after OHT because no liaison-psychiatrist or psychologist was integrated in the transplantation team within this period. A retrospective review of psychiatric assessments routinely performed during the waiting period was realized by the same psychiatrist (J.-M. Triffaux). *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised* (DSM III-R) [1] Axis I diagnoses were assigned based on documentation of the criteria for an active psychiatric disorder or a recent history of psychiatric disorders at the time of consultation. All patients were in New York Heart Association class IV before surgery. Furthermore, 21 patients (51%) presented with ischemic cardiomyopathy, 18 patients (44%) with dilatative cardiomyopathy, and 2 patients (5%) with valvular cardiomyopathy. This sample was representative of the population of heart recipients with respect to age, gender, and heart disease.

A control group of 29 presumably healthy volunteers of similar sex ratio (22 males and 7 females) and age (56.2 ± 17.5 years;

range: 36–89 years) was used for comparison. None of them had known psychiatric or somatic disorders, and all had to fill out the same questionnaires as the OHT patients.

Psychological assessment

Healthy individuals and OHT patients alike were given the following three questionnaires:

1. The *Beck Depression Inventory* (BDI) is considered to be the most satisfactory self-rating depression scale from a methodological point of view. Beck published a short form limited to 13 of the 21 original items, the validity of which has been checked by Beck and al. [3]. Depression is assessed as follows: no depression (0–4), mild depression (5–7), moderate depression (8–15), and severe depression (≥ 16).
2. Spielberger's *State-Trait Anxiety Inventory* (STAI) (form Y) [26] consists of two parts. The STAI-state section includes 20 items intended to measure transitory feelings of tension and apprehension, while the STAI-trait section evaluates the stable personality trait of anxiety proneness. In normal working males, reference values (mean \pm SD) are 35.7 ± 10.4 for STAI-state and 34.9 ± 9.2 for STAI-trait. In normal working females, the norms are 35.2 ± 10.6 and 34.8 ± 9.2 for STAI-state and STAI-trait, respectively.
3. The *General Health Questionnaire* (GHQ, 28 items) [10] is a recognized instrument for the screening of minor psychiatric morbidity; the GHQ scale ranges from 0 to 28 and the cut-off value is usually taken between 4 and 5 (a score of 0–4 is regarded "normal", whereas a score of 5 or more indicates the presence of psychopathology).

Statistical analysis

Results are generally expressed as mean and standard deviation (SD). Because of small sample sizes and of non-gaussian distribution of variables, psychological scores of OHT patients and healthy volunteers were compared by the Wilcoxon rank-sum test. The relationship between psychological scores or between psychological scores and time of assessment after OHT was tested by means of the Spearman correlation coefficient. The classic χ^2 -test was used to compare proportions. Results were considered to be significant at the 5% critical level ($P < 0.05$). All statistical calculations were carried out using SAS, release 6.12 for Unix (SAS Institute).

Results

Of the 41 patients who underwent cardiac transplantation, 17 (41%) were found to show evidence of active or recent DSM III-R Axis I psychiatric disorders. Patients were grouped into affective, adjustment, anxiety, and substance-related disorders (Table 1). The demographic data did not show any significant differences between the groups with or without psychiatric disorders. Psychological scores in OHT patients and in healthy individuals are displayed in Table 2. It is seen that heart transplant patients have significantly higher BDI scores than healthy subjects ($P = 0.007$), indicating on-average signs of depression. Among the 41 OHT patients, 7

Table 1 Demographic characteristics of 41 orthotopic heart transplant patients (31 men and 10 women, aged 57.2 ± 9.2 years) (DSM III-R Diagnostic and statistical manual of mental disorders, 3rd. edn., rev. [1])

DSM III-R Axis I psychiatric diagnosis	n	%
Affective disorder	7	17
Adjustment disorder	7	17
Anxiety disorder	2	5
Alcohol dependence	1	2
No diagnosis	24	59

Table 2 Mean values and SD of psychological scores in orthotopic heart transplant (OHT) patients and healthy volunteers (range is given in parentheses) (BDI Beck Depression Inventory: depression scale [3], STAI State-Trait Anxiety Inventory: anxiety scale [26], GHQ General Health Questionnaire [10])

Questionnaire	OHT patients (n = 41)	Control subjects (n = 29)	P value
BDI	6.7 \pm 6.6 (0-22)	2.6 \pm 2.5 (0-9)	0.007
STAI-state	36.9 \pm 11.5 (20-57)	33.0 \pm 7.9 (22-54)	0.22
STAI-trait	40.7 \pm 12.8 (20-68)	39.3 \pm 8.0 (24-53)	0.83
GHQ	4.0 \pm 4.8 (0-19)	1.2 \pm 2.0 (0-7)	0.003

(17%) were classified as mildly depressed, 9 (22%) as moderately depressed, and 5 (12%) as severely depressed. Thus, depression was detected in over 50% of OHT patients by the BDI questionnaire.

GHQ scores were also significantly increased ($P < 0.003$) in OHT patients as compared to normal individuals. Using the cut-off values described previously, we found that 15 OHT patients (37%) and 4 healthy subjects (14%), respectively, were considered abnormal (score ≥ 5). The two proportions were significantly different ($P < 0.05$). By contrast, STAI-state and STAI-trait values were similar in both groups. Moreover, they did not differ significantly from the reference values given in the "Patients and methods" section. When studying BDI, STAI, and GHQ scores against time of assessment after OHT, no significant relationship was evidenced. Spearman correlation coefficients were 0.23 ($P = 0.15$) for BDI, 0.10 ($P = 0.52$) for STAI-state, 0.12 ($P = 0.46$) for STAI-trait, and -0.23 ($P = 0.14$) for GHQ, respectively. No sex or age effect could be discerned.

Discussion

The present cross-sectional study was conducted to analyze the postoperative evolution of psychological scores in OHT patients who received only routine care without specific psychological intervention during the transplant process. A healthy group was used for comparison. Our results showed significantly higher scores of depression

and somatic complaints in OHT patients than in healthy individuals. This confirms the results of a previous study in which affective illnesses had occurred in 51% of patients [24]. Recent reports show that the vast majority of these patients exhibit adjustment disorders with anxiety-depressive symptoms [22]. Most patients experience a decrease in anxiety during the initial months after transplantation, but anxiety continues to be a problem and particularly associated with fears of graft rejection, infection, neoplasm, renal insufficiency, and death [29].

In addition, postoperative depression remains a very significant clinical problem. These depressed patients present a higher risk for noncompliance, either unconsciously or as a deliberate suicidal act that may not be detected [15]. Furthermore, the somatic status after transplantation and the limitations in social and everyday life could contribute to their level of psychological distress. Some authors have carried out longitudinal studies which suggest that the psychological evolution after OHT is not the same for all patients [14, 25]. Specifically, for some patients the psychological status progressively improves in the postoperative period, while for others it does not. Although the ability exists to predict who may be at risk of distress after transplantation, objective data are lacking on the impact of psychological distress on medical outcome after surgery [18]. The influence of predictive variables and their implication for treatment remains to be elucidated and requires further prospective longitudinal studies, as recently suggested [29].

Our findings did not show a substantial effect of time on psychological scores of OHT patients in the 4-year period following surgery. These results support the hypothesis of the relative stability of psychological scores in this period. However, the systematic psychosocial screening after transplantation should have contributed to a better following of the evolution of psychiatric distress and to the identification of the need for more psychiatric or psychosocial intervention.

The limitations of this study are twofold. First, the small sample size decreased the statistical validity of the findings. Only one team participated in the study and, consequently, this limited sample depended on the data collection of a single transplantation center. Second, the study was mainly retrospective. The lack of donor organs made the accumulation of prospective data difficult. The presence of psychiatric diagnosis was obtained by retrospective review of routine psychiatric consultations performed as part of the preoperative evaluation of the candidates.

However, in an effort to improve the consistency of diagnosis, all assessments were performed by a single reviewer using DSM III-R criteria. Since insufficient data were available to accurately assign definitive personality disorders, these diagnoses were excluded from the analysis. The study displays some original findings. Our

results confirm the lower quality of life of patients after OHT as compared to healthy subjects and show that psychological scores do not appear to be significantly related to the time they were recorded after surgery. Most studies of quality of life demonstrate that physical functioning very often improves from pre- to post-transplantation, while improvement in mental health/cognitive status and social quality of life is less certain [8]. Though the transplant patients face major changes in their emotional and social lives as they undergo the physical transformations associated with transplantation, psychiatric and psychosocial service programs remain variably accepted by many transplantation centers. The ideal organ transplantation team ought to include psychiatrists, psychologists, and social workers for all candidates at

each phase of the transplantation process. This paper supports the usefulness of an integrated psychosomatic approach of patients before and after OHT to achieve optimal success during the course of transplantation. Our results emphasize the need for intensified psychotherapeutic and/or psychopharmacological treatment of such patients in a multidisciplinary transplantation health care professional team. However, further European multicenter studies are still necessary to provide standards for an optimal care system and to establish baseline measures of mental functioning to be able to monitor and treat postoperative changes.

Acknowledgements The authors are indebted to Dr. R. Leroux (Montreal Cardiology Institute) for helpful advice and comments.

References

1. Diagnostic and statistical manual of mental disorders (1987), DSM III-R, 3rd edn., rev., American Psychiatric Association, Washington, DC
2. Barsky AJ, Ahern DK, Brener J, Surman OS, Ring C, Dec GW (1998) Palpitations and cardiac awareness after heart transplantation. *Psychosom Med* 60: 557-562
3. Beck AT, Rial WY, Rickels K (1974) Short form of depression inventory: cross-validation. *Psychol Rep* 34: 1184-1186
4. Bunzel B, Laederach-Hofmann K, Schubert MT (1999) Patients benefit - partners suffer? The impact of heart transplantation on the partner relationship. *Transpl Int* 12: 33-41
5. Caine N, Sharples LD, Dennis C, Higenbottam TW, Wallwork J (1996) Measurement of health-related quality of life before and after heart-lung transplantation. *J Heart Lung Transplant* 15: 1047-1058
6. Cupples SA, Nolan MT, Augustine SM, Kynoch D (1998) Perceived stressors and coping strategies among heart transplant candidates. *J Transpl Coord* 8: 179-187
7. Dew MA, Simmons RG, Roth LH, Schulberg HC, Thompson ME, Armitage JM, Griffith BP (1994) Psychosocial predictors of vulnerability to distress in the year following heart transplantation. *Psychol Med* 24: 929-945
8. Dew MA, Goycoolea JM, Switzer GE, Allen AS (2000) Quality of life in organ transplantation: effects on adult recipients and their families. In: Trzepacz P, Dimartini A (eds) *The transplant patient. Biological, psychiatric, and ethical issues in organ transplantation*. Cambridge University Press, Cambridge, pp 67-145
9. Fisher DC, Lake KD, Reutzel TJ, Emery RW (1995) Changes in health-related quality of life and depression in heart transplant recipients. *J Heart Lung Transplant* 14: 373-381
10. Goldberg DP, Hillier VF (1979) A scaled version of the General Health Questionnaire. *Psychol Med* 9: 139-145
11. Grady KL, Jalowiec A, White-Williams C (1996) Improvement in quality of life in patients with heart failure who undergo transplantation. *J Heart Lung Transplant* 15: 749-757
12. Hetzer R, Albert W, Hummel M, Pasic M, Loebe M, Warnecke H, Haverich A, Borst HG (1997) Status of patients presently living 9 to 13 years after orthotopic heart transplantation. *Ann Thorac Surg* 64: 1661-1668
13. Kaba E, Shanley E (1997) Identification of coping strategies used by heart transplant recipients. *Br J Nurs* 6: 858-862
14. Kugler J, Tenderich G, Stahlhut P, Posival H, Korner MM, Korfer R, Kruskemper GM (1994) Emotional adjustment and perceived locus of control in heart transplant patients. *J Psychosom Res* 38: 403-408
15. Levenson JL, Olbrisch ME (1993) Psychiatric aspects of heart transplantation. *Psychosomatics* 34: 114-123
16. Littlefield C, Abbey S, Fiducia D, Cardella C, Greig P, Levy G, Maurer J, Winton T (1996) Quality of life following transplantation of the heart, liver, and lungs. *Gen Hosp Psychiatry* 18 [Suppl 6]: 36S-47S
17. Lough ME, Lindsey AM, Shinn JA, Stotts NA (1985) Life satisfaction following heart transplantation. *J Heart Transplant* 4: 446-449
18. Maricle RA, Hosenpud JD, Norman DJ, Pantely GA, Cobanoglu AM, Starr A (1991) The lack of predictive value of preoperative psychologic distress for postoperative medical outcome in heart transplant recipients. *J Heart Lung Transplant* 10: 942-947
19. Paris W, Brawner N, Thompson S, Penido M (1997) Psychosocial issues in heart transplantation: a review for transplant coordinators. *J Transpl Coord* 7: 88-93
20. Riedmayr MI, Tammen AR, Behr TM, Witting C, Bullinger M, Reichart B, Angermann CE (1998) Perspectives of patients with terminal renal failure: quality of life and psychological adjustment before and in the first year after heart transplantation (Original in German). *Z Kardiol* 87: 808-816
21. Roman DD, Kubo SH, Ormaza S, Francis GS, Bank AJ, Shumway SJ (1997) Memory improvement following cardiac transplantation. *J Clin Exp Neuropsychol* 19: 692-697
22. Salmon P, Mikhail G, Stanford SC, Zielinsk S, Pepper JR (1998) Psychological adjustment after cardiac transplantation. *J Psychosom Res* 45: 449-458
23. Shapiro PA (1996) Psychiatric aspects of cardiovascular disease. *Psychiatr Clin North Am* 19: 613-629
24. Shapiro PA, Kornfeld DS (1989) Psychiatric outcome of heart transplantation. *Gen Hosp Psychiatry* 11: 352-357
25. Shapiro PA, Williams DL, Foray AT, Gelman IS, Wukich N, Sciacca R (1995) Psychosocial evaluation and prediction of compliance problems and morbidity after heart transplantation. *Transplantation* 60: 1462-1466

-
26. Spielberger CD (1983) Manual for the state-trait anxiety inventory (STAI) (form Y; self-evaluation questionnaire). Consulting Psychologists Press, Palo Alto
 27. Spurkland I, Bjorbaeck T, Geiran O (1999) Chronic heart or lung disease and psychological stress (Original in Norwegian). *Tidsskr Nor Laegeforen* 119: 209-213
 28. Triffaux JM, Bertrand J, Bertrand O, Demoulin JC, Defraigne JO, Kulbertus H (1994) Psychological evolution and assessment after heart transplantation. *Eur Psychiatry* 9 [Suppl 1]: 71
 29. Trzepacz P, Dimartini A (eds) (2000) The transplant patient. Biological, psychiatric, and ethical issues in organ transplantation. Cambridge University Press, Cambridge
 30. Zipfel S, Lowe B, Paschke T, Immel B, Lange R, Zimmermann R, Herzog W, Bergmann G (1998) Psychological distress in patients awaiting heart transplantation. *J Psychosom Res* 45: 465-470