Symptoms of anxiety and depression in liver-transplant patients

M. A. Pérez San Gregorio[a], A. Martín Rodríguez[a], E. Asián Chaves[b] and J. Pérez Bernal[c]

[a] *Psychology School. Personality, Evaluation and Psychology Department of the University of Seville.*
[b] *Intensive Care Units of Transplant.* [c] *Sector Coordination of Transplants. University Hospital Virgen del Rocío. Seville. Spain*

Sintomatología ansiosa y depresiva en los pacientes trasplantados hepáticos

Summary

Introduction. *We analyzed the influence of two variables (place of hospitalization of the patients and mental health of relatives) on anxiety and depression symptoms in liver-transplant patients.*

Methods. *The subject groups were made up of 48 liver-transplant patients and 48 close relatives. The tests applied were a psychosocial questionnaire and the following instruments: The Hospital Anxiety and Depression Scale, The Leeds Scales for the Self-Assessment of Anxiety and Depression and Social Support Scale.*

Results. *The liver-transplant patients showed more symptoms of depression when they were admitted in the Intensive Care Unit (ICU) and more symptoms of anxiety in the post-ICU phase when their close relatives were more depressed in that phase, as a result of receiving little social support.*

Conclusions. *The place of hospitalization of the patients and the mental health of relatives influenced symptoms of anxiety and depression in liver-transplant patients.*

Key words: *Organ transplantation. Anxiety. Depression. Intensive Care Unit. Social Support.*

Resumen

Introducción. *Hemos analizado la influencia de dos variables (lugar de hospitalización de los pacientes y salud mental de los familiares) sobre la sintomatología ansiosa y depresiva de los trasplantados hepáticos.*

Métodos. *Hemos seleccionado dos grupos de sujetos: 48 trasplantados hepáticos y los 48 familiares más allegados a estos pacientes. Hemos empleado una encuesta psicosocial y los siguientes instrumentos: Escala de Ansiedad y Depresión en Hospital, Escalas de Ansiedad y Depresión de Leeds y Escala para la Evaluación del Apoyo Social.*

Resultados. *Los trasplantados hepáticos presentan más sintomatología depresiva cuando están ingresados en la unidad de cuidados intensivos (UCI) y más sintomatología ansiosa en la fase post-UCI cuando sus familiares más allegados se hallan más depresivos en dicha fase, lo cual suele ocurrir cuando éstos reciben un escaso apoyo social.*

Conclusiones. *El lugar de hospitalización de los pacientes y el estado anímico de los familiares ejerce una influencia sobre la sintomatología ansiosa y depresiva de los pacientes trasplantados hepáticos.*

Palabras clave: *Trasplante de órganos. Ansiedad. Depresión. Unidad de Cuidados Intensivos. Apoyo social.*

INTRODUCTION

Although organ transplantation is now a totally consolidated treatment, its psychological repercussions are numerous in both the patients (for example, alterations in the mood state, anxiety disorders, body image disorders, problems of identification with the donor and his/her family, etc.) as well as in the closest relatives (for example, guilty feelings, fear of death, etc.)[1,2]. Specifically, some investigations have associated hepatic transplantation to delirium, mood state disorders (basically, major depression and dysthymic disorder), adaptive disorders, somatomorphic disorders, anxiety disorders (basically, post-traumatic stress disorder) and short psychotic disorder not associated to immunosuppressant toxicity[3-5].

Regarding the relatives of the transplant patients, the few existing investigations focus on the caretakers of heart and kidney patients and all coincide in stating that the process of the psychosocial integration of the organ is not easy for either the patient or the partner. For example, after the transplant, the relatives consider that communication, affective involvement and values and rules that govern the relationship become worse[6]. In addition, 47% of the caretakers report an increase in family burden, for example, many more medical visits are necessary and the caretaker cannot return to his/her style of life prior to the transplant. Equally, the risk of rejection is always present, which increases anxiety of the family members, especially if the transplant patients do

Correspondence:
M. Angeles Pérez San Gregorio
Facultad de Psicología
Departamento de Personalidad, Evaluación y Tratamiento Psicológicos
Camilo José Cela, s/n
41018 Sevilla (Spain)
E-mail: anperez@us.es

not follow the prescribed treatment[7,8]. All this has a repercussion on the mental health of the relatives, so that it was found that 7.7% fulfilled the criteria of post-traumatic stress disorder in an investigation performed with 142 caretakers of transplant patient[9].

Given the importance of this subject, this present investigation establishes the main objective of analyzing the influence of the two following variables exerted on mental health (fundamentally, anxious and depressive symptoms) of the hepatic transplant recipients: *a)* on the one hand, the hospitalization site of the patients: Intensive Care Units (ICU) (patient with a recent implantation and admitted to the ICU) and post-ICU (patients discharged from the ICU but hospitalized in the ward), and *b)* on the other hand, mental health (fundamentally, anxious and depressive symptoms) of the closest relatives of the liver transplant recipients, specifying the weight that the social support received has on this variable.

METHODS

Subjects

Two groups of subjects were selected: 48 liver transplant recipients and 48 closest family members of these patients (only one relative per transplant recipient patient).

The transplant group was made up of 34 men and 14 women, with a mean age of 51.15 years. In regards to the etiology of the liver transplant, there was a predominance of ethylic cases (52.2%), followed by viral (34.8%), others (8.7%) and cholestatic (4.3%). The hospitalization duration was a mean of 11.60 days in the Intensive Care Unit (ICU) of Transplants and a mean of 19.74 days in the Liver Transplantation Unit. The 48 livers implanted came from 27 men and 21 women, who died due to the following causes: stroke (53.2%), cranioencephalic traumatism (42.6%) and others (4.2%).

The family group was made up of 10 men and 37 women, with a mean age of 45.45 years. The relationship that they had with the patients was: wife/husband (61.7%), son/daughter (21.3%), brother/sister (8.5%), father/mother (6.4%) and others (2.1%). There was a predominance of relatives who lived with the patients (77.1%) and the relations with them were good in most of the cases (93.8%).

Procedure

The liver transplant recipients and their closest relatives were assessed at two different times: ICU (when the patient was recently transplanted and was admitted to the ICU) and post-ICU (when the patient was discharged from the ICU but continued in the hospital, specifically, in the Liver Transplantation Unit).

Both in the first phase (ICU) as well as the second one (post-ICU), we allowed some days to go by before proceeding to the psychological assessment so that the subject could adapt to the hospitalization conditions and circumstances: 6.20 days (transplanted patients) and 5.36 days (relatives) in the ICU and 8.60 days (transplanted patients) and 8.83 days (relatives) in the post-ICU.

As general characteristics considered in the selection of the subject, it is required that they do not present alterations in sensorial aptitudes or mental state that would prevent them from having spatial-time orientation or maintaining a suitable conversation. In every case, the selection of the subjects was performed according to the order in which the patients received the transplant and were hospitalized in the ICU.

Except in the ICU phase in which all the transplant recipients were evaluated in this Unit, the evaluation was carried out in the rest of the cases (relatives [ICU phase] and patients and relatives [post-ICU phase]) in an adjacent office located in each one of the Units involved (ICU of Transplants and Liver Transplantation Unit). The evaluations were performed by a psychologist with extensive experience in the instruments used and with a large population.

Instruments

Psychosocial survey: it was adapted to the characteristics of the two groups used in this study and refers to sociodemographic data (gender, age, sociocultural and economic level, etc.), medical (etiology causing the liver transplantation, rejection episodes, etc.), psychological (expectations towards the disease, experience of highly stressing situations occurring in their life, etc.) and relatives (the relative and recipient patient live or do not live in the same home, type of relationship between both, etc.).

Hospital Anxiety and Depression Scale[10]: it is made up of fourteen items, seven referring to depression and seven to anxiety, in which reference is made to how the subject has felt during the last week, it being necessary to choose one of four possibilities of answers. The test provides two values, one for anxiety and another for depression, and in both cases, the scores are classified in: normal (0-7 points), doubtful (8-10 points) and clinical problem (≥ 11 points). This scale was applied to the liver transplant recipients.

Leeds Scale for Anxiety and Depression[11]: it is made up of twenty two items with four alternatives of responses, of which the subject must select one. The test, besides providing an «anxiety-depression total score», offers five other values: on the one hand, «specific anxiety», «specific depression» and «differential score». After the latter value, we obtain the following classification: predominance of anxious symptoms (score < –4), predominance of depressive symptoms (score > +4) or mixed cases, that is, with anxious and depressive symptoms (scores between –4 and +4). And other the other hand, «general anxiety» that is classified as presence (score ≥ 7) or absence (score < 7) of clinical anxiety and «general depression», that is classified as presence (score ≥ 6) or absence (score < 6) of clinical depression. This scale was applied to the closest relatives of the liver recipients.

Social Support Assessment Scale[12]: it is made up of six items with four response alternatives of which the subject must choose one. The test provides a total score that can be classified as low social support (< 15 points), moderate social support (between 15 and 29 points) and high social support (> 30 points). This scale was applied to the closest relatives of the liver recipients.

RESULTS

Comparison of the anxious and depressive symptoms that are presented by the liver recipients between the ICU and post-ICU phases

We applied the Student-Fisher's *t* parametric test for related samples and only the variable «total depression score» of the patients was significant ($p < 0.01$); of these, the patients in ICU scored higher (4.53) than those in the post-ICU (3.11) (table 1). We have carried out an analysis of items on this variable to detect which ones had the most weight (table 1).

Influence of anxious and depressive symptoms of the closest relatives of the liver recipients on the anxious and depressive symptoms of the patients, both in the ICU as well as in post-ICU

All the variables referring to the relatives («anxiety-depression total score», «specific anxiety», «specific depression», «differential score», «general anxiety» and «general depression») of the ICU and post-ICU phases were divided into two subgroups (low score and high score) in order to compare the variables referring to the patients («total anxiety score» and «total depression score») of the ICU and post-ICU phases between both. Only the influence of the variable post-ICU general depression of the relative was significant. The procedure that we followed was the following: we made up two subgroups of relatives based on the total scores obtained in this variable. On the one hand, relatives with scores equal to or less than 47.2%, that is, a total score of 4 points or less, constituting a subgroup of 17 subjects (low general depression) and on the other hand, relatives with scores greater than 47.2%, that is, a total score greater than 4 points, constituting a subgroup of 19 patients (high general depression). To compare the differences existing between both subgroups of relatives in the anxious and depressive symptoms that the liver transplant recipients experienced in the post-ICU phase, we applied the Mann-Whitney U non-parametric test and found statistically significant differences ($p < 0.01$) in the variable «post-ICU anxiety total score» of the transplanted patients. The patients whose relatives present «high general depression» (7.00) scored higher than the patients whose relatives present «low general depression» (7.76) (table 2). In order to discriminate those items that had more weight in these differences, we carried out an analysis of the items on the variable «post-ICU anxiety total score» of the transplanted patients with this same statistical test (table 2).

On the other hand, in order to analyze the weight of social support on the mental health of the relatives, these were divided into two subgroups based on the total scores obtained on the Social Support Scale: on the one hand, relatives with scores equal to or less than 52.2%, that is, a total score of 25 points or less, constituting a subgroup of 24 subjects (low social support) and, on the other, relatives with scores greater than 52.2%, that is, a total score greater than 25 points, constituting a subgroup of 22 subjects (high social support).

TABLE 1. Comparison of the anxious and depressive symptoms that are presented by the liver transplanted recipients between the ICU and post-ICU phases

Liver transplated recipients	*Hospitalization*		
	ICU	*Post-ICU*	*Significance*
Anxiety total score	7.08	5.64	0.097
Depression total score	4.53	3.11	0.005**
I still enjoy what I used to like •	0.94	0.47	0.011*
I can laugh and see the funny side of things •	0.44	0.17	0.039*
I have lost interest in my physical appearance	0.78	0.44	0.026*

The higher the score, the more to subject identifies with the variable or sentence, except in • (the higher the score, the more the subject disagrees with the sentence). * $p < 0.05$; ** $p < 0.01$.

TABLE 2. Influence of post-ICU general depression of the closest relatives of the liver transplanted recipients on the anxious and depressive symptoms of the patients in post-ICU

Liver transplanted recipients	*Closest relatives of the liver transplanted patients*		
	High post-ICU general depression	*Low post-ICU general depression*	*Significance*
Post-ICU anxiety total score	7.00	3.76	0.009**
I feel tense and uncomfortable	1.58	0.82	0.030*
I have a sensation of fear. as if something terrible was going to happen to me	0.84	0.18	0.042*
Post-ICU depression total score	3.37	3.00	0.219

The higher the score, the more the subject identifies with the variable or sentence. * $p < 0.05$; ** $p < 0.01$.

The anxious and depressive symptoms of both subgroups (low social support and high social support) of the relatives were compared with the Mann-Whitney U non-parametric test. The following variables in which the relatives with low social support scored significantly higher than those with high social support were significant ($p \leq 0.05$): «ICU anxiety-depression total score» (25.02 and 18.52), «ICU general anxiety» (7.85 and 5.05), «post-ICU anxiety-depression total score» (24.05 and 14.86) and «post-ICU general depression» (5.65 and 3.67). The variable «ICU differential score», in which the families with low social support (–1.55) scored significantly lower than the families with high social support (0.90) was also significant (table 3). We performed an analysis of items on these variables that were significant with the Mann-Whitney U non-parametric test, in order to detect the items that had the greatest weight (table 4).

TABLA 4. Comparison of the anxious and depressive symptoms in the closest relatives of the liver transplanted recipients based on the social support received. Analysis of items

	Social support		
	Low	*High*	*Significance*
Family anxious and depressive symptoms (UCI)			
I feel anxious when I leave home uanccompanied	1.20	0.33	0.004**
I get tired for no reason	1.30	0.40	0.004**
I have palpitations, sensation of tension in my stomach or weight on my chest	1.75	0.95	0.021*
I often think that I have not done anything	0.95	0.43	0.042*
Family anxious and depressive symptoms (post-ICU)			
I still enjoy the things that I used to like •	1.25	0.27	0.009**
I have strong headaches	1.50	0.40	0.002**

The higher the score, the more to subject identifies with the variable or sentence, except in • (the higher the score, the more the subject disagrees with the sentence). * $p < 0.05$; ** $p < 0.01$.

DISCUSSION AND CONCLUSIONS

This investigation is based on the need to analyze the influence of the following variables on the psychological repercussion of the liver transplant:

Hospitalization site

During the time interval in which the liver transplant recipients were hospitalized, it was found that they were worse psychologically when they were admitted to the ICU. This could be due to, among other reasons, the fact that the situation of the ICU has a series of specific characteristics that give rise to the fact that it can be considered as a stressing situation: spatial (there are machines the invade the patient's space, artificial light, monotonous sounds, etc.), temporality (the natural rhythms of day and night are lost, perception of death is on a first level due to the death of other patients, etc.) and depersonalization (the health care staff do not establish a personal relationship with the patients due to the emergency of the therapeutic intervention, to the fact that the stay duration of the patient is short, to the interpersonal intervention of the machines, etc.)[13]. These characteristics together with the fact that the patient is physically worse in this phase leads to the ICU being a stressing life event for the transplanted recipients that has a negative repercussion in their mental health. For example, it increases the depressive symptoms of these patients who state that «they do not enjoy things that they used to like» «they cannot laugh and see the funny side of things» and «they lose interest in their physical appearance».

TABLE 3. Comparison of the anxious and depressive symptoms in the closest relatives of the liver transplanted recipients based on the social support received

Closes relatives of the liver transplanted recipients	*Social support*		
	Low	*High*	*Significance*
ICU anxiety-depression total score	25.05	18.52	0.049*
ICU specific anxiety	7.05	4.38	0.056
ICU specific depression	5.80	5.38	0.385
ICU differential score	–1.55	0.90	0.021*
ICU general anxiety	7.85	5.05	0.037*
ICU general depression	5.50	5.00	0.519
Post-ICU anxiety-depression total score	24.05	14.86	0.043*
Post-ICU specific anxiety	5.75	4.60	0.400
Post-ICU specific depression	5.90	3.73	0.055
Post-ICU differential score	–0.55	–0.87	0.831
Post-ICU general anxiety	6.10	4.73	0.382
Post-ICU general depression	5.65	3.67	0.050*

The higher the score, the more the subject identifies with the variable * $p \leq 0.05$.

Anxious and depressive symptoms of the relatives

In the post-ICU phase, the influence of the «general depression» variable is significant, that is, the transplanted recipients present more anxiety (for example, «they feel tense or uncomfortable» and «they have a sensation of fear, as if something terrible was going to happen to them») when their caretakers are depressed. This could be due to the fact that the patients do not receive the

support that they need from their relatives because they have a mood state (sadness, apathy, negative expectations, etc.) that incapacitates them to provide physical and psychological support, which deteriorates the quality of life of the patients and creates a state of uncertainty and anxiety[14]. In addition, this lack of support by the relatives towards the patients due to their mood state could have serious effects, since the absence of support is one of the predictors having the greatest weight in drop-out from medical treatment[15].

However, the weight that social support received by the relatives of the transplanted recipients has on their own mental health must be taken into account since those perceiving low social support presented more anxious and depressive symptoms during both the ICU phase (for example, «they felt anxious when they left home unaccompanied», «they got tired for no reason», «they had palpitations, sensation of tension in their stomach or weight on their chest» and «they often thought that they had not done anything») as well as the post-ICU phase (for example, «they did not enjoy things that they used to enjoy» and «they had strong headaches»). The worsening of the mental health of the caretakers could be due, among other reasons, to the fact that they did not have the support of others to face a series of stressors that generally appear after the transplant: fear that the patient may die, feeling that no one is concerned about them or their health, financial concerns and concern about whether the new organ will function[7].

In spite of the influence of the previous variables in the psychological repercussions of the liver transplant, it must be kept in mind that the quality of life of the patients improves after the liver implant and the anxious and depressive symptoms presented by the transplant recipients and their relatives decrease in comparison with the pre-transplantation phase, basically because the anxiety of waiting for an organ and the fear of the operation has ended[16,17].

Faced with these facts, we consider that the main techniques that should be included in a psychotherapeutic program aimed at improving the quality of life of liver transplant recipients and their relatives would be the following: cognitive restructuring techniques (to eliminate the irrational beliefs related, fundamentally, with the future functioning of the organ), technique of seeking social support (to decrease social contract avoidance behaviors), relaxation techniques (to decrease anxiety and excess of physiological activation) and problem solving techniques (to teach them basic strategies to face all the problems arising form the transplant). In addition, a series of prophylactic measures would be necessary in the ICU (for example, avoiding that the patient loses time orientation, endeavoring that the patient has a watch or calendar nearby or personal objects, maintaining the monitors out of the sight of the patient and preventing the appearance of false alarms that can frighten the patient, avoiding medical comments by the bed of the patient that can be misinterpreted, etc.) to prevent the appearance of psychological disorders in the patients[18].

ACKNOWLEDGEMENTS

This investigation has been financed by the Health Care Research Fond (Health Care Institute Carlos III) within the National Plan of Scientific Investigation, Developement and Technology Innovation (I+D+I 2000-2003).

REFERENCES

1. Pérez MA, Martín A. Variables psicológicas relacionadas con la percepción de la imagen corporal en los pacientes trasplantados. Rev Psicol Gen Aplic 2002;55:439-53.
2. Pérez MA, Martín A, Gallego A, Santamaría JL. Influencia de algunas variables médicas y psicosociales en la recuperación psicológica de los trasplantados. Futuras líneas de intervención psicológica. Rev Psicopatol Psicol Clin 2000; 5:71-87.
3. Dew MA, Switzer GE, DiMartini AF, Matukaitis J, Fitzgerald MG, Kormos RL. Psychological assessment and outcomes in organ trasplantation. Progr Transplan 2000;10:239-61.
4. Fukunishi I, Sugawara Y, Takayama T, Makuuchi M, Kawarasaki H, Surman OS. Psychiatrics disorders before and after living-related transplantation. Psychosomatics 2001;42:337-43.
5. Pantiga C, Rodrigo LR, Cuesta M, López L, Arias JL. Cognitive deficits in patients with hepatic cirrhosis and in liver transplant recipients. J Neuropsychiatry Clin Neurosci 2003;15:84-9.
6. Bunzel B, Laederach-Hofmann K, Schubert MT. Patients benefit-partners suffer? The impact of heart transplantation on the partner relationship. Transpl Inter 1999;12:33-41.
7. Collins EG, White-Williams C, Jalowiec A. Spouse quality of life before and 1 year after heart transplantation. Crit Care Nurs Clin North Am 2000;12:103-10.
8. Wicks MN, Milstead EJ, Hathaway DK, Cetingok M. Family caregivers' burden, quality of life, and health following patients' renal transplantation. J Transpl Coord 1998;8:170-6.
9. Stukas AA, Dew MA, Switzer GE, DiMartini A, Kormos RL, Griffith BP. PTSD in heart transplant recipients and their primary family caregivers. Psychosomatics 1999;40:212-21.
10. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983;67:361-70.
11. Snaith RP, Bridge GW, Hamilton M. The Leeds scales for the self-assessment of anxiety and depression. Br J Psychiatry 1976;128:156-65.
12. Conde V, Franch JI. Escalas de evaluación comportamental para la cuantificación de la sintomatología psicopatológica en los trastornos angustiosos y depresivos. Madrid: Upjohn, 1984.
13. Dörr-Zeger O. Espacio y tiempo en la unidad de cuidado intensivo. Actas Luso Esp Neurol Psiquiatr 1988;4:246-54.
14. Christensen AJ, Raichle K, Ehlers SL, Bertolatus JA. Effect of family environment and donor source on patient quality of life following renal transplantation. Health Psychology 2002;21:468-76.
15. Kiley DJ, Lam CS, Pollak R. A study of treatment compliance following kidney transplantation. Transplantation 1993;55:51-6.
16. Moore KA, Burrows GD, Hardy KJ. Anxiety in chronic liver disease: changes post transplantation. Stress Medicine 1997;13:49-57.
17. Shih FJ, Hu RH, Ho MC, Lin HY, Lin MH, Lee PH. Changes in health-related quality of life and working competence before and after liver transplantation. Transplan Proc 2000;32:2144-8.
18. Gómez E, López MA, Cirera E. El paciente en cuidados intensivos. En: Rojo JE, Cirera E, editores. Interconsulta psiquiátrica. Barcelona: Masson, 1997; p. 469-77.