



## Living and deceased transplanted patients one year later: Psychosocial differences just after surgery<sup>1</sup>

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**ABSTRACT.** The purpose of this *ex post facto* investigation is to determine whether there are differences in a series of psychosocial variables (anxiety, depression, Type A behavior pattern, and social support), which can be assessed immediately after transplantation, between the transplanted patients who die and those who are still alive one year after the transplant. From a group of 166 transplanted patients, we selected two subgroups (22 living transplanted patients and 22 deceased transplanted patients) that were homogeneous in the main sociodemographic and clinical variables. We used a psychosocial survey, the Hospital Anxiety and Depression Scale, the Type A Characteristics Checklist, and the Scale for the Assessment of Social Support. The results showed that the patients who subsequently died, had higher levels of depression, and particularly anxiety, immediately after the transplant. In contrast, the subgroups did not differ in Type A behavior pattern or level of social support. We conclude that symptoms of anxiety and depression at that moment of the medical process, may allow us to distinguish patients who will die from those who will survive.

**KEYWORDS.** Organ transplant. Mortality. Anxiety. Depression. *Ex post facto* study.

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**RESUMEN.** El objetivo de esta investigación *ex post facto* es determinar si en una serie de variables psicosociales (ansiedad, depresión, patrón de conducta tipo A y apoyo social), que pueden evaluarse justo después de un trasplante, existen diferencias entre los trasplantados que fallecen y los que permanecen vivos cuando ha transcurrido un año desde el implante. A partir de un grupo de 166 trasplantados, seleccionamos dos subgrupos (22 trasplantados vivos y 22 trasplantados fallecidos) que eran homogéneos en las principales variables sociodemográficas y clínicas. Empleamos una Encuesta Psicosocial, la Escala de Ansiedad y Depresión en Hospital, el Listado de Características Tipo A, y la Escala para la Evaluación del Apoyo Social. Los resultados mostraron que los pacientes que más tarde fallecerían, justo después del trasplante sufrían mayores niveles de depresión y, sobre todo, de ansiedad. Por el contrario, ambos subgrupos no se distinguían en cuanto a patrón de conducta tipo A o en nivel de apoyo social. Concluimos que los síntomas de ansiedad y depresión presentes en ese momento del proceso médico, pudieran permitirnos distinguir entre los pacientes que morirán y los que sobrevivirán.

**PALABRAS CLAVE.** Trasplante de órganos. Mortalidad. Ansiedad. Depresión. Estudio *ex post facto*.

Organ transplant is a therapeutic alternative for patients who suffer some dysfunction in one of their vital organs, which allows them to live for years with good quality of life (Magaz, 2006). Despite this, diverse psychological complications have sometimes also been observed: anxiety, depression, sexual dysfunctions, dissatisfaction with body image, feelings of guilt about the death of the donor, fantasies about the donor, and a feeling of excessive gratitude toward the donor's family (Kaba, Thompson, Burnard, Edwards, and Theodosopoulou, 2005; Pérez, Martín, and Galán, 2005). In addition, some studies show that patients go through different psychological stages (Pérez-San-Gregorio, Martín-Rodríguez, and Galán-Rodríguez, 2007).

Although from a medical viewpoint, great scientific advances have been achieved, which have led to higher survival rates of grafts and patients as a result of the immunosuppressor treatments, the negative impact of certain psychosocial variables should not be ignored, whether they appear in the pre- or the post-transplant stage. Specifically, among the more relevant predictors of the mortality rate in these patients are the following: substance-related disorders (Jaen, Pintor, and Peri, 2004; Owen, Bonds, and Wellisch, 2006), mood disorders (Lopes *et al.*, 2002; Owen *et al.*, 2006; Zimmermann, Alves, and Mari, 2006), anxiety disorders (Dew *et al.*, 1999; Zipfel *et al.*, 2002), low compliance with medical treatment (Owen *et al.*, 2006; Paris, Muchmore, and Pribil, 1994; Shapiro, Williams, and Foray, 1995), recurrent suicidal attempts (Owen *et al.*, 2006), avoidant coping strategies, lack of positive expectations, and scarce social support (Jaen *et al.*, 2004).

From a psychological perspective, we consider it essential to identify the psychosocial variables in the pre- or post-transplant stage that differentiate the living patients from the deceased ones. The ultimate purpose of all this is to intervene psychologically on these variables and to attempt to increase the survival rate of transplanted patients.

Along these lines, we have only found one investigation focusing on pre-transplant assessment, specifically, the study of Zimmermann *et al.* (2006), in which they administered the Beck Depression Inventory (BDI; Beck, Rush, Shaw, and Emery, 1979) to 125 patients who were on the waiting list for a renal transplant. Seven years after the transplant, they compared the patients who had survived with those who had died and concluded that the latter were the ones who, at the pre-transplant stage, were older and had a greater number of depressive symptoms. There are many studies about the relationship between depressive symptoms and mortality in other populations (for example, Pettit *et al.*, 2008).

In view of the relevance of this line of research and the few existing works, the purpose of this investigation is to determine whether there are differences in a series of psychosocial variables (anxiety, depression, Type A behavior pattern, and social support), which can be assessed immediately after transplantation, between the transplanted patients who die and those who are still alive one year after the transplant.

## Method

### *Participants*

We selected two groups of patients who had undergone transplant from a deceased person: a) the group of living transplanted patients, made up of 22 patients (16 liver-transplants, 3 renal-transplants, and 3 heart-transplants) who still survived one year after the transplant; and b) the group of deceased transplanted patients, made up of 22 patients (16 liver-transplants, 3 renal-transplants, and 3 heart-transplants) who had died during the one-year interval following the transplant. Either the group of living transplanted patients or the group of deceased transplanted patients were made up of 12 men and 10 women. Sociodemographic and clinical data are displayed in Table 1.

### *Instruments*

- Psychosocial Survey. This was elaborated by the authors of this investigation and referred to sociodemographic data (gender, age, civil status, educational level, or labor activity) and clinical data (etiology, length of the transplant, duration of hospitalization, or donor characteristics).
- Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983). This instrument has 14 items, 7 of depression and 7 of anxiety, in which patients indicate how they felt during the past week, selecting one four response possibilities. The test provides two scores, one for anxiety and the other for depression; in both cases, the scores are classified as: “normal” (0-7 points), “mild” (8-10 points) and “clinical problem” ( $\geq 11$  points). In Spanish studies, alpha values range between .80 and .90. We used the version developed by Caro and Ibáñez (1992).
- Type A Characteristics Checklist (Beech, Burns, and Sheffield, 1982/1986): this instrument has 13 items with two response alternatives (yes or no). In this scale, the highest scores indicate a higher number of behaviors that are typical of Type A behavior pattern (competitiveness, hostility, impatience, etc.) in the person’s

habitual behavioral repertory. There are no steady data about the psychometric properties of this instrument.

- Scale for the Assessment of Social Support (Conde and Franch, 1984): this has 6 items with 4 response alternatives, from which the person selects one alternative about the type of social relations they have in various daily life contexts. 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). There are no steady data about the psychometric properties of this instrument.

### *Procedure*

According to the classification of Montero and León (2007), this is an *ex post facto* study, and “retrospective, with two groups and a quasi-control group”; we have taken into consideration the guide for creating research papers proposed by Ramos-Álvarez, Moreno-Fernández, Valdés-Conroy, and Catena (2008). The investigation has three stages. Firstly, during the two-year time interval, we selected a group of 166 patients (47% liver patients, 42.8% kidney patients, and 10.2% heart patients) who were transplanted in the Hospital Universitario Virgen del Rocío of Sevilla (Spain) and who met the following inclusion criteria: 1) being over 18 years of age; 2) preserving the cognitive functions that allow completing the tests; 3) having received a first transplant of a solid organ (liver, kidney, or heart) proceeding from a deceased person; and 4) signing the informed consent form. Secondly, we assessed four variables (anxiety, depression, Type A behavior pattern, and social support) in all the patients at the same time, that is, when they were discharged from the ICU but were still hospitalized, concretely in the Transplant Unit. Thirdly, one year after the transplant surgery, we identified the 22 patients who had died within the total group of 166 patients; the demise was mainly due to chronic rejection of the graft and subsequent multiorgan failure. In order to take into account two homogeneous groups (living and deceased), we selected another 22 patients from among the 144 who were still alive. For this purpose, we paired the groups taking into account the variables type of organ transplanted, age, and gender. In those cases in which there were various patients who fulfilled the same conditions, selection was random.

### *Data analysis*

All the analyses were performed with the SPSS 14.0 statistical package. To determine whether the two groups (living and deceased) were similar in sociodemographic and clinical variables, we established comparisons with the following statistics: Chi-square, Mann-Whitney’s U, and Student’s t, depending on the measurement unit of each variable. Student’s t was used to compare the two groups in the four criterion variables (anxiety, depression, Type A behavior pattern, and social support). Although this test is considered robust, the reduced size of the sample made it advisable to confirm the results with nonparametric tests (Mann-Whitney’s U); in all cases, both statistical tests led to the same results.

## Results

We compared the two groups of the investigation in the main sociodemographic and clinical data (see Table 1), except for the variables gender and type of organ transplanted, in which both groups were equal. As can be seen in the tables, there were group differences only in two variables: educational level ( $p = .02$ ), which was slightly higher in the living patients than in the deceased ones (range 26.57 vs. 18.43); and length of stay in the Transplant Unit ( $p = .01$ ), which was lower in the living patients (15.77 days) than in the deceased (31.19 days).

**TABLE 1.** Comparisons between living and deceased transplanted patients in sociodemographic and clinical data.

Variable	Living transplanted patients (n = 22)	Deceased transplanted patients (n = 22)	Statistic (t, $\chi^2$ , U)	p
Age -M (SD)-	48.68 (10.26)	49.36 (10.50)	$t_{(42)} = .21$	.82
Civil status (%)				
Single	4.50	9.10	$\chi^2 = .36$	.83
Married	86.40	81.80		
Separated	9.10	9.10		
Educational level (%)				
Illiterate	4.50	4.50	U = 152.500	.02*
No studies	4.50	36.40		
Primary studies	50	40.90		
Secondary studies	27.30	9.10		
Middle university studies	4.50	4.50		
Higher university studies	9.10	4.50		
Work activity (%)				
Housework	27.30	27.30	$\chi^2 = 3.04$	.55
Students	0	4.50		
Retired	45.50	50		
Unemployed	0	4.50		
Employees	27.30	13.60		
Length of stay in ICU -M (SD)-	8.59 (4.95)	12.09 (8.07)		
Length of stay in transplant unit -M (SD)-	15.77 (9.42)	31.19 (29.30)	U = 125.500	.01**
Donor's gender (%)				
Men	63.60	45.50	$\chi^2 = 1.46$	.18
Women	36.40	54.50		
Donor's age -M (SD)-	39.95 (16.99)	47.82 (20.77)	$t_{(42)} = 1.37$	.17
Cause of death of donor (%)				
Craneoencephalic trauma	45.50	33.30	$\chi^2 = .67$	.71
Stroke	50	61.90		
Others	4.50	4.80		

\*  $p < .05$ ; \*\*  $p < .01$

Regarding the psychosocial variables (anxiety, depression, Type A behavior pattern, and social support) that were compared in the two groups, significant differences were found in the variables anxiety ( $p = .01$ ) and depression ( $p = .02$ ) (see Table 2). In both variables, the patients who had died scored significantly higher than those who were still alive one year after transplant surgery.

**TABLE 2.** Comparisons between living and deceased transplanted patients in psychosocial data.

<i>Variable</i>	<i>Living transplanted patients (n = 22)</i> <i>M (SD)</i>	<i>Deceased transplanted patients (n = 22)</i> <i>M (SD)</i>	<i>t</i> ( <sub>42</sub> ) <i>value</i>	<i>p</i>
Anxiety	4.59 (3.06)	7.64 (4.37)	2.67	.01*
Depression	2.73 (2.76)	4.73 (2.88)	2.35	.02*
Type A behavior pattern	6.75 (3.02)	7.45 (3.73)	.65	.51
Social support	25.14 (5.73)	24.41 (7.18)	-.37	.71

Note: \*  $p < .05$ . The higher the score, the higher the identification with the variable.

Focusing on anxiety, when classifying the patients at different levels of severity (normal/mild/clinical), we found that, in the deceased transplanted patients, 68.2% were at the “normal” level, 4.50% were “mild”, and 23.30% were at the “clinical” level. In contrast, among the living patients, 81.80% were considered “normal”, 13.60% “mild”, and 4.50% were at the “clinical” level. In addition, when comparing each one of the items of the variable anxiety with Mann-Whitney’s U statistic, in all cases, the values were higher in the group of deceased patients, although the difference was only statistically significant in the item “I get sudden feelings of panic” ( $p = .002$ ) (see Table 3).

**TABLE 3.** Comparisons between living and deceased transplanted patients in the variables anxiety and depression.

<i>Item</i>	<i>Living transplanted patients (n = 22)</i> <i>M (SD)</i>	<i>Deceased transplanted patients (n = 22)</i> <i>M (SD)</i>	<i>U value</i>	<i>p</i>
Symptoms of anxiety				
I feel tense or wound up	1.14 (.83)	1.50 (.86)	187.500	.14
I get a sort of frightened feeling as if something awful is about to happen	.32 (.57)	.73 (.83)	172.500	.06
Worrying thoughts go through my mind	.55 (.96)	1.14 (1.17)	169.500	.06
I can sit at ease and feel relaxed (+)	.86 (.71)	1.05 (.78)	218.500	.53
I get a sort of frightened feeling like “butterflies” in the stomach	.45 (.51)	.73 (.77)	199.000	.25
I feel restless as if I have to be on the move	1.05 (1.05)	1.50 (1.01)	179.500	.12
I get sudden feelings of panic	.23 (.43)	1.00 (.98)	122.000	.002**
Symptoms of depression				
I still enjoy the things I used to enjoy (+)	.23 (.528)	.91 (1.19)	167.000	.03*
I can laugh and see the funny side of things (+)	.23 (.43)	.41 (.67)	215.000	.41
I feel cheerful (+)	.45 (.67)	.59 (.67)	212.000	.42
I feel as if each I am slowed down	.82 (.79)	1.09 (.92)	202.000	.31
I have lost interest in my appearance	.32 (.84)	.64 (.79)	176.000	.05
I look forward with enjoyment to things (+)	.14 (.35)	.50 (.60)	163.500	.02*
I can enjoy a good book or TV program (+)	.55 (.80)	.59 (.67)	223.000	.61

Note: \*  $p < .05$ , \*\*  $p < .01$ . The higher the score, the higher the agreement with the statement, except for (+), which is reversed.

In the case of the variable depression, when classifying the patients at different levels of severity (normal/mild/clinical), we found that, in the deceased transplanted patients, 81.80% were at the “normal” level, 13.60% were “mild”, and 4.50% were at the “clinical” level. In contrast, among the living patients, 90.90% were considered “normal”, 4.50% “mild”, and 4.50% were at the “clinical” level. Regarding the items of the variable depression, in all items, the deceased scored higher than the living patients, but this difference was only statistically significant in two items: “I still enjoy the things I used to enjoy” ( $p = .03$ ) and “I look forward with enjoyment to things” ( $p = .02$ ) (see Table 3).

### Discussion

The purpose of this investigation was to determine whether there are differences in a series of psychosocial variables, which can be assessed immediately after transplantation, between the transplanted patients who died and those who are still alive one year after transplant surgery. However, we first had to confirm that there were no sociodemographic and clinical differences between the two groups. For this purpose, we carried out the corresponding comparisons, which revealed that the two groups were very similar in all the variables, and there were only slight differences in the educational level (which was somewhat higher in the living patients), and in the length of their stay in the Transplant Unit (which was slightly longer in the patients who died). This kind of limitation occurs in any study, including ours, which faces the impossibility of counting on groups that allow perfect comparison, especially if we take into account that certain medical pathologies are associated with specific sociodemographic or contextual data. Taking this unavoidable limitation into account, we found that, in our study, the two groups were equal in most of the sociodemographic (age, gender, civil status, and work activity) and clinical variables (type of organ transplanted, length of time in the ICU, and donor’s gender, age, and cause of death).

Having guaranteed this similarity of the two groups, we addressed the central goal: the comparison of the living and deceased patients in anxiety, depression, Type A behavior pattern, and social support. There were only statistically significant differences in the first two variables. The patients who subsequently died had higher levels of depression, and particularly anxiety, immediately after the transplant. In contrast, the subgroups did not differ in Type A behavior pattern or level of social support. A possible explanation of these facts is that the patients with a high level of anxiety after the transplant surgery were probably the ones who paid less attention to their health habits, which leads to less quality of life, which, if worse comes to worst, could cause the patients’ death. In fact, some studies have shown that, if the level of anxiety after transplant is very high, there are four areas that are affected over the following year: psychological (more anxious and depressive symptomatology), social (more conflicts in family life and in social activities), physical (more digestive problems), and economic (more financial problems) (Pérez, Martín, Díaz, and Pérez, 2006; Pérez, Martín, and Pérez, 2008). If thoughts of excessive concern (*e.g.*, “I might get an infection and reject the organ at any time”) and questions (*e.g.*, “Have I acquired the donor’s characteristics?”)

that can generate an anxious state in the patients are added to the former problems, then these patients will have “sudden feelings of panic” that will make them stray from health behaviors (exercise, food, medication, medical check-ups, etc.). All this has a negative impact on the survival of the grafts and could increase the mortality rate of the patients.

Depressive symptomatology after transplant was also higher in the transplanted patients who died over the following year, in comparison to those who were still alive. This is probably due to the fact that depression leads to a lower rate of compliance with medical treatment, which is directly related to organ rejection and the patients' mortality rate (Barr *et al.*, 2003; Grandi *et al.*, 2001; Ribera and Permanyer, 2006; Triffaux *et al.*, 2001). Also, the cognitive aspects are very relevant, and a pessimistic attitude or expectations (“I do not enjoy the things I used to like”, “I do not feel optimistic about the future”) could cause failure to cope with the transplant (Goetzmann *et al.*, 2007) and/or suicidal behaviors or attempts that may be indirectly expressed by the patient's noncompliance with therapeutic prescriptions (Cooper, Lanza, and Barnard, 1984).

Nevertheless, there is a possible alternative explanation that should be addressed in future studies. In effect, the group of deceased patients stayed for a longer period of time in the Transplant Unit than the patients who survived. Therefore, there may have been relevant medical difficulties immediately after transplantation, and this may be reflected in more anxious and depressive symptomatology. Likewise, it could be that the anxious and depressive symptoms affected the longer time spent in the hospital. This situation may be similar in “educational level”, which may be related to lifestyle and other variables. These alternative explanations must be studied throughout future researches. Nevertheless, independently of the explanatory mechanisms, the fact that anxious and depressive states after transplant are associated with patients' long-term mortality is a very valuable finding.

Another particularly noteworthy result of our study is the fact that Type A behavior pattern and social support were not related to patient mortality. These two variables have been addressed in some investigations in which their influence on patients' adherence to immunosuppressor treatments (Dew *et al.*, 2000; Owen *et al.*, 2006), as well as on mental health (Pérez, Martín, Gallego, and Santamaría, 2000) has been the center of debate. Regarding their influence on patient mortality, our results contribute to this field of research, indicating that, in the area of transplantation, a Type A behavior pattern or the level of social support immediately after the transplant do not allow us to predict patients' survival over the next year.

The main finding of our study is the confirmation that the patients' affective state (anxious and depressive symptomatology) immediately after transplant may allow us to distinguish patients who will die from those who will survive. We consider this result to be extremely relevant and that future research should focus on getting a deeper knowledge of the relationship we have found, and the early identification of the affective state of the patients in order to carry out psychotherapeutic intervention with patients who are at clinical levels. This would allow patients to achieve a good adaptation after the transplant, and to learn to cope with the rigorous regime of medication, constant medical supervision, and the negative effects of the immunosuppressor medication. This way, we could increase the survival of the grafts and decrease the mortality rate of the transplanted patients.



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