

# Assessment of emotional distress in chronic kidney disease patients and kidney transplant recipients

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## ABSTRACT

**Objective.** To assess the presence of emotional distress in patients with chronic kidney disease (CKD), and the effect of kidney transplant on these symptoms. **Material and methods.** This was a two-part study. Part one was cross-sectional, observational, and descriptive, where 75 patients with CKD were evaluated for emotional distress with the Hospital Anxiety and Depression Scale (HAD) and the Symptom Checklist 90 (SCL-90). In part two, we longitudinally followed 19% of the study cohort to examine symptomatological changes after their kidney transplantation. **Results.** The results of the HAD indicated that 30.7% of the study cohort with End-Stage Renal Disease (ESRD) showed anxious symptoms, and 25.3% showed depressive symptoms. The change in the HAD total score before and after kidney transplant was not significant. However, a significant decrease in total score on the SCL-90 was observed before and after transplantation. **Conclusion.** Improvement on emotional distress was found after kidney transplantation.

**Key words.** Anxiety. Depression. Kidney transplant. Emotional distress. Renal failure.

## INTRODUCTION

Chronic kidney disease (CKD) is a pathophysiologic process with multiple causes that results in progressive, irreversible attrition of the number and

## *Evaluación de distrés emocional en pacientes con insuficiencia renal crónica y trasplante renal*

## RESUMEN

**Objetivo.** Valorar la presencia de distrés emocional en pacientes con insuficiencia renal crónica (IRC), así como el efecto del trasplante renal en dicha sintomatología. **Material y métodos.** El estudio se realizó en dos fases. La primera parte fue transversal, observacional y descriptiva, en la que 75 pacientes con IRC fueron evaluados para distrés emocional con el Hospital Anxiety and Depression Scale (HAD) y el Symptom Checklist 90 (SCL-90). En la segunda parte, longitudinalmente, se siguió a 19% de la muestra para evaluar los cambios en la sintomatología después del trasplante renal. **Resultados.** Los resultados del HAD indicaron que 30.7% de los pacientes con insuficiencia renal crónica terminal (IRCT) mostraron síntomas ansiosos y 25.3% de los mismos manifestaron síntomas depresivos. Los cambios encontrados en las medias del HAD antes y después del trasplante no fueron significativos. Sin embargo, se observó una disminución significativa en las medias obtenidas por el SCL-90 antes y después del trasplante. **Conclusión.** Se encontró una mejoría en el distrés emocional después del trasplante renal.

**Palabras clave.** Ansiedad. Depresión. Trasplante renal. Distrés emocional. Insuficiencia renal.

function of nephrons. A consequence of CKD is that it leads to end stage renal disease (ESRD), a condition in which an irreversible loss of the endogenous renal function occurs resulting in the patient to permanently depend on renal replacement therapy.<sup>1</sup>

Receiving the diagnosis of a chronic disease such as ESRD can result in substantial stress given the multiple complexities faced by the patients. The hospital environment can lead to behavioral and emotional changes including alterations in normal habits, decreased activities of daily living, hypersensitivity to strangers (e.g., new doctors, nurses, nursing aids), confusion, and feeling helpless.<sup>2</sup> The two most common psychological problems in patients diagnosed with ESRD are anxiety and depression.<sup>3,4</sup>

What is unclear is whether the presence of emotional distress in this group of patients is related to the adjustment to all of the difficulties associated with ESRD and related therapies (and, therefore, occurs predominantly at the beginning of the treatment), or whether these symptoms are more frequent in subsequent phases of the disease.<sup>6,16</sup> For example, depression in patients with continuous ambulatory peritoneal dialysis (CAPD) has been attributed to psychological factors such as feelings of hopelessness and increased stress, rather than to demographic or physical factors.<sup>9</sup> Depression can be present as a response to a real, potential, or imaginary loss and can worsen over time as complications (e.g., vascular difficulties, neurological diseases, dizziness) emerge, contributing to greater health risks, and decreased quality of life.<sup>10,17</sup> Furthermore, it has been found that the prevalence of depression affects the survival and prognosis of patients under replacement therapy of renal function,<sup>5,6</sup> even when already transplanted,<sup>7</sup> as treatment adherence is also affected.<sup>8</sup>

Many investigations have demonstrated the presence of emotional distress (anxiety and depression) in ESRD patients, but due to methodological variations,<sup>4,6,11,12,14,16,17</sup> there are considerable knowledge gaps. A majority of investigations were conducted with different cohorts of surgical patients and found that anxiety levels were elevated when the diagnosis is made prior to surgery, and decreases throughout the process or in the post-surgical period. However, there was no information regarding the time period required for the anxiety severity to decrease.<sup>2,11</sup> It has been suggested that within the year after an organ transplant, the presence of emotional distress is related to various factors including organ rejection, infections, medication usage and side effects, economic burdens, and uncertainty about the future.<sup>12-14</sup> Some of the psychological symptoms that may be present in kidney recipients before and after the transplant include anxiety, fear of physical vulnerability, possible complications or death, and feelings of guilt related to the kidney donation.<sup>15</sup>

The few articles with a pre-post kidney transplant evaluation used instruments that assessed other constructs (i.e. alexithymia) than anxiety and depression.<sup>18,19</sup> Further, some studies used anxiety and depression rating instruments that were unreliable and invalid for medically ill patients, such as the Beck Depression Inventory (BDI),<sup>6,8</sup> the Zung Self-rating Depression Scale,<sup>12</sup> or the Center for Epidemiologic Studies Depression Scale (CES-D).<sup>7,14</sup> Given the lack of evidence, it is unclear whether the presence of anxious and depressive symptoms are related to their psychological presence or to the physical symptomatology that is associated with ESRD.

## OBJECTIVE

The aim of this study was to evaluate the presence of emotional distress in patients with CKD with appropriate instruments for medically ill patients, and to assess the effects of kidney transplant on these symptoms.

## METHOD AND MATERIALS

### General overview and study methods

The present report shows results from a two-phase study. The first part used cross-sectional, observational, and descriptive methods to establish the presence of emotional distress. The second part was a prospective study where we compared emotional distress scores before and six months after participants underwent kidney transplant.

For part one, we included patients with ESRD who attended the nephrology out-patient clinic of the National Institute of Medical Sciences and Nutrition Salvador Zubirán in Mexico City from January 2006 to March 2008. We included participants who met the following inclusion criteria:

- Age  $\geq 18$ .
- No history or clinically evident cerebrovascular disease as diagnosed by neurologic examination.
- No major visual or hearing impairments that prohibit completion of study assessments.
- Absence of acute or chronic psychosis, severe learning disabilities and/or dementia.

All study participants provided written informed consent for this Institutional Review Board approved study.

Part two of the study included only those patients with ESRD who received kidney transplant during

the development of the study, and who maintained adequate renal function after the transplant.

### Study rating instruments

The study instruments used to document emotional distress included the Hospital Anxiety and Depression Scale (HAD) and the Symptom Checklist 90 (SCL-90). The HAD<sup>20</sup> measures anxious and depressive symptoms in patients without evident psychiatric pathology who are in a general hospital setting. The content of the HAD is centered around psychological symptoms of anxiety and depression rather than the somatic symptoms, which helps to reduce false positives when applied to medically ill patients. The instrument obtains scores for the variables Anxiety (Cut-off score: 8) and Depression (Cut-off score: 7).<sup>21</sup>

The SCL-90<sup>22</sup> is an instrument composed of 90 questions with a Likert scale response format of five points of distress ranging from Not at all (zero) to Extremely (four) affecting during the last week. This instrument evaluates nine dimensions of primary symptoms including somatization, obsession-compulsion, interpersonal sensibility, depression, anxiety, hostility, phobic anxiety, paranoia, and psychoticism. The SCL-90 has been shown to be reliable and valid in Mexican patients.<sup>23</sup>

### Statistic analysis

A descriptive analysis according to the measurement level of the variables was done. Significant results were established by  $p < 0.05$ . A McNemar  $\chi^2$  test was used to compare the hypothesis of equal proportions in medical and socio-demographic variables between those patients who did and did not

show anxious and depressive symptoms on the HAD. For the longitudinal study (part 2), we used paired T-test analyses to compare the scores on the HAD and SCL-90 before and after the transplant was done. The analyses were conducted using SPSS v12.0 (Chicago, Illinois).

## RESULTS

### Part 1. Cross-sectional phase

We included 75 patients (34 male, 41 female) in the cross-sectional study. The socio-demographic and clinical characteristics of these patients are presented in table 1. The study sample had a mean of  $54.1 \pm 45.8$  and a median of 48 (range: 1-204) months with the ESRD. The patients in dialysis had a mean of  $20.8 \pm 27.1$  and a median of 9 (range: 0-96) months in replacement therapy.

The sample showed a mean of  $5.87 \pm 3.56$  (range: 0-14) on the HAD anxiety variable and a  $4.29 \pm 3.08$  (range: 0-14) on the depression variable. Of the sample, 30.7% showed anxious symptoms and 25.3% showed depressive symptoms according to the cut-off scores of HAD. No difference in proportions of medical and sociodemographic variables were found between those patients who did and did not demonstrate anxious and depressive symptoms on the HAD.

### Part 2. Longitudinal phase

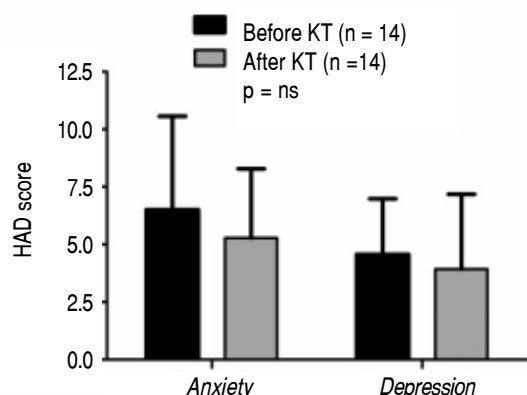
Fourteen patients of the 75 assessed at baseline received a transplant during the study period. Their socio-demographic and clinical characteristics are presented in table 1. These patients had a mean of

Table 1. Sociodemographic and clinical characteristics of the sample.

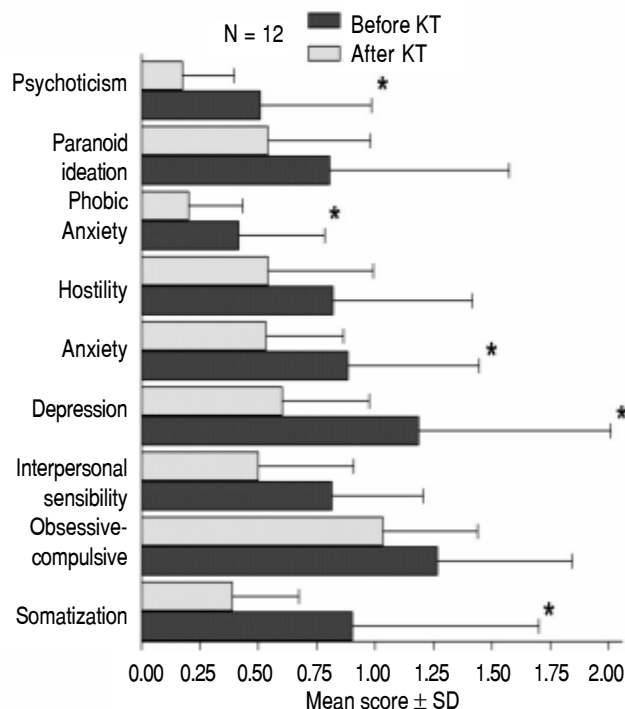
Sociodemographic and clinical characteristics	Transversal sample (n = 75)		Longitudinal Sample (n = 14)	
	M $\pm$ SD	n (%)	M $\pm$ SD	n (%)
• Gender (female)	-	41 (54.7)	-	4 (28.6)
• Age (years)	$37.12 \pm 13.03$	-	$31.36 \pm 13.02$	-
• Education (years)	$11.97 \pm 4.20$	-	$12.93 \pm 3.95$	-
• Dialysis treatment	-	-	-	-
- Peritoneal dialysis	-	28 (37.3)	-	6 (42.9)
- Hemodialysis	-	23 (30.7)	-	8 (57.1)
- No dialysis treatment	-	24 (32)	-	0 (0)
• Main Comorbidities	-	-	-	-
- Hypertension	-	64 (85.3)	-	13 (92.9)
- Anemia	-	39 (52)	-	10 (71.4)

47.4  $\pm$  41.5 and a median of 33.5 (range: 6-162) months with the ESRD, and they had a mean of 16.2  $\pm$  11.2 and a median of 15 (range: 1-36) months in replacement therapy. The means for the HAD anxiety and depression scores before and after kidney transplant are presented in figure 1.

Although there was a small decrease on the HAD anxiety [ $t(12) = 1.19$ ,  $P = 0.25$ ] and depression



**Figure 1.** Comparison of anxiety and depression mean scores of HAD scale for kidney transplant recipients before and after kidney transplantation (KT). All measures are mean  $\pm$  standard deviation. ns: not significant.



**Figure 2.** Comparison of emotional distress symptoms mean scores of the SCL-90 before and after kidney transplantation (KT). All measures are mean  $\pm$  standard deviation (SD). \* $p < 0.05$ .

[ $t(12) = 1.28$ ,  $P = 0.22$ ] scores after the transplant, these differences were not significant.

Only 12 of the 14 participants completed the SCL-90 before and after the transplant; two patients could not complete the instrument due to time constraints. Scores obtained by the SCL-90 are presented in figure 2.

A trend was found for decreasing scores on the SCL-90 for all dimensions of emotional stress after the kidney transplant. The dimensions for which the decrease was statistically significant after the transplant were:

- Somatization [ $t(11) = 2.81$ ,  $P = 0.01$ ].
- Depression [ $t(11) = 2.79$ ,  $P = 0.01$ ].
- Anxiety [ $t(11) = 2.45$ ,  $P = 0.03$ ].
- Phobic anxiety [ $t(11) = 2.91$ ,  $P = 0.01$ ].
- Psychoticism [ $t(11) = 3.51$ ,  $P = 0.005$ ].

## DISCUSSION

This is one of the first studies to systematically assess temporal changes in emotional distress in patients with CKD who undergo transplantation surgery. We found that, in general, emotional distress in ESRD patients decrease after kidney transplantation.

The cross-sectional data showed that 30.7% of the patients with ESRD had anxious symptoms and 25.3% had depressive symptoms, demonstrating that an important number of patients present with such symptoms during the course of the disease and before renal transplant. According to Hedayati<sup>17</sup> and Craven,<sup>24</sup> 21% of ESRD patients in different stages are diagnosed with major depressive disorder or dysthymia based on research diagnostic criteria. This finding is commensurate with our study results demonstrating that utility of measuring anxious and depressive psychological content, rather than somatic content as the latter is confounded by medical illness and can result in high false positive rates.

For the SCL-90, those symptoms with greater levels were:

- Obsessive-compulsive (which may be characterized by a need of control over the disease).
- Depression (negative thoughts and feelings about the disease).
- Somatization (related physical symptoms).

For the longitudinal phase, in both HAD and SCL-90, mean scores on anxiety and depression decreased. However, for the HAD, such differences

were not significant, which is likely due to the instrument's characteristics. It seems as though the SCL-90 is more sensible for detecting changes in the affective state of these patients, as a trend of post-transplant mean values decreasing in relation to pre-transplant means is observed in every symptom measured by the instrument. The dimensions in which these differences were significant were: somatization, depression, anxiety, phobic anxiety, and psychoticism.

The somatization subscale evaluates the presence of discomfort related to different corporal dysfunctions perceived by the individual. An elevation on this scale before the transplant is a result of physical symptomatology that is characteristic of ESRD; therefore, as long as the patient improves in physical symptomatology after transplantation, somatization symptomatology should decrease, as seen by Bague-lin-Pinaud,<sup>11</sup> where health perceived by the patient was greater after transplantation.

The depression subscale items are a representative sample of the principal clinical manifestations of a depressive disease: dysphoric emotional state, lack of motivation, low vital energy, feelings of hopelessness, and suicide ideation. As seen in figure 2, this subscale is one in which scores were more elevated and in which the patients showed greater improvement.

The subscale of anxiety evaluates the presence of general symptoms such as nervousness, tension, panic attacks, and fears. The elevation in this scale can be explained in different ways. In one way, some of the symptoms before the transplant could be situational since the scale was applied while the patients were hospitalized days before the transplant. As surgery is an emotionally disturbing situation, an increase in these symptoms can exist. On the other hand, it has been widely described that such symptoms are common in this population (even when not hospitalized) as they are associated with related stressors and/or metabolic factors, nutrition factors, or inflammation.<sup>2,25</sup> Improvement in all of these factors is typically present after the transplant, decreasing anxiety symptoms.

The phobic anxiety scale of the SCL-90 refers to a persistent response of fear (to specific persons, places, objects, or situations) that is irrational and disproportionate to the stimuli that provokes it. Phobias are the more common anxiety diseases in the general population and are presented in a combination of external events with inner predispositions. The increase in this scale before the transplant is not high enough to be considered a phobia; howe-

ver, in some ESRD patients, it may be related to a fear of going to some places or situations where they might feel exposed (physical or emotionally). It is possible that the decrease in scores on this subscale after the transplant is explained by the fact that independence from renal replacement therapy gives patients more self-confidence and freedom to develop in their environment.

Elevation in the subscale of psychoticism before the transplant is lower than the mean; therefore, more than being a psychotic process, it may be associated with social isolation and the search for solitude notably reduced after renal transplant.

The longitudinal evaluation of patients is one of the principal strengths of this study, as there are no studies in Mexico with a pre-post kidney transplant evaluation of the same patients. Although there are other studies, the evaluation methods are different, such as Fukunishi, *et al*,<sup>19</sup> who evaluate two groups of patients to compare the pre-post transplantation incidence of psychiatric disorders evaluated by a clinical interview, between liver transplantation and kidney transplantation recipients.

The study was limited by a small sample size, the absence of a control group, and the use of self-report scales. Despite the small sample size, we still found statistical and clinically meaningful results that provide the basis to further evaluate temporal changes in emotional distress in patients with CKD. As this was one of the first studies to evaluate temporal trends, a control group was not necessary; nonetheless, the findings are limited to the study cohort and require confirmation in case-control studies. Lastly, the HAD and the SCL-90 are psychometrically sound instruments and show high concordance rates with similar clinician rated instruments. Harding, *et al*,<sup>26</sup> suggest that self-report forms are beneficial as they allow for implementation of research practices into clinical practice to inform measurement based care techniques.

Further studies are needed to elucidate the mechanisms underlying the changes in emotional distress, such as the use of immunosuppressive medications, personality characteristics, or associated stressors. The obtained results make clear that, in general, emotional distress presented by patients before the transplant is reduced following the transplant.

## ACKNOWLEDGEMENTS

The present study has been done with support of Fondo Institucional para el fomento de la ciencia, el

fomento de la tecnología y el fomento, desarrollo y consolidación de científicos y tecnólogos (SEP-CONACyT). Project Number: 24124-CB-2005-01-51560. The funding body was not involved in the study design or analysis.

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Recibido el 18 de marzo 2010.

Aceptado el 18 de mayo 2011.