

Longitudinal prospective study on quality of life and psychological distress before and one year after liver transplantation

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Abstract

Background : The impact of liver disease and medical complications on quality of life (QOL) and psychological distress before and after liver transplantation (LT) is a matter of growing interest.

Methods : In a longitudinal prospective study, perceived QOL (LEIPAD Quality of Life test) and psychological distress (Brief Symptom Inventory, BSI) were assessed in 25 cirrhotic patients when they were listed for LT and 1, 3, 6 and 12 months after LT. Patients were also evaluated for medical complications and blood levels of immunosuppressive agents.

Results : Overall QOL and psychological distress improved significantly and rapidly in most domains from the first month and up to a year after LT. Medical complications and immunosuppressive agents did not correlate with any changes in QOL and psychological distress after LT.

When patients were divided according to liver disease etiology : 1. HCV patients listed for LT had worse QOL levels than the group of patients as a whole or the alcoholic liver disease (ALD) patients ; 2. HCV patients reported a significant improvement in QOL only 6 and 12 months after LT, and still suffered more psychological distress 12 months after surgery ; 3. in ALD patients, overall QOL and psychological distress improved significantly at all follow-up points after LT ; 4. HCV patients reported a worse QOL and greater psychological distress 1 and 3 months after LT than the group as a whole or the ALD patients ($p < 0.05$).

Conclusions : Liver transplantation improves QOL and psychological distress in most recipients, but not in the early stages after LT in patients transplanted for HCV cirrhosis. (*Acta gastroenterol. belg.*, 2005, 68, 19-25).

Key words : quality of life, psychological distress, liver transplantation, alcoholic liver disease, HCV infection.

Introduction

The health-related quality of life (QOL) subjectively perceived by patients, is becoming a major issue in the assessment of any therapeutic interventions (1). Assessing QOL has become a vital measure of outcome in patients undergoing liver transplantation (LT) : the goal of transplantation is to assure the patient the best possible QOL by replacing the diseased liver and keeping patients symptom-free and living in the community (2-9). Specific preoperative medical, psychological and personality criteria are being sought to identify patients most likely to benefit from transplantation. QOL studies are mandatory to obtain information on how to prepare candidates for LT and how to help LT recipients improve their self-care capacity and well-being.

Post-transplant QOL levels do not return to those recorded in the general population, however (5,6), and

the factors responsible for the persistent difference remain poorly defined. QOL and psychological distress after LT may be influenced by complications following surgery, the effect of immunosuppressive treatment (10,11) or the recurrence of HCV hepatitis (12), as shown in a previous cross-sectional study (13).

Alcoholic liver disease (ALD) ranks as the second leading reason for LT among adults in Italy (14). Despite similar survival rates between alcohol-related and non-alcohol-related LT recipients (15,16), ALD is perceived as a controversial indication for LT by the general public, mostly because of the risk of recidivism (17,18). Results in terms of QOL are controversial in this setting, but recent reports suggest that the overall QOL in ALD patients is much the same as in patients transplanted for non-alcoholic liver disease (19,20).

With a view to confirming our previous results in a longitudinal prospective study, the purposes of the present study were : 1. to evaluate QOL and psychological distress in adult cirrhotic patients before and after LT ; 2. to evaluate the effect of immunosuppression and medical complications on QOL and psychological distress ; 3. to evaluate the influence of HCV infection and alcoholic etiology on QOL and psychological distress after LT.

Methods

Patients

Twenty-five patients joined the longitudinal study and underwent psychological and medical assessment when they were listed for LT and then 1, 3, 6 and 12 months after LT. All patients completed the study (18 males, 7 females ; mean age \pm SD : 46.3 \pm 12.1 years, range 20-61). Table 1 shows the patients' demographic characteristics and liver disease etiology.

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Table 1. — Demographic characteristics of patients and etiology of liver disease

Patients (n)	25
Sex	
M/F	18/7
Age	
Mean	46.3
SD	12.1
Range	20-61
Education (years at school)	
5	8
6-8	10
9-13	6
> 13	1
Work	
Employed	10
Retired	12
Homework	3
Marital status	
Unmarried	4
Married	20
Divorced	1
Etiology of liver disease	
Alcohol	8
HCV	8
HBV	5
Cholestasis	2
Other	2

Quality of Life and psychological distress evaluation

When listed for LT and 1, 3, 6 and 12 months after LT, all patients underwent QOL and psychological distress evaluation using standardized self-testing questionnaires, including measures for physical, psychological and work-performance domains. The *LEIPAD Quality of Life Scale* (21) and *Brief Symptoms Inventory (BSI)* (22) were used. The former is a generic QOL evaluation tool assessing physical, mental and socio-economic dimensions; the latter is a specific instrument designed to assess psychological status and detect emotional and psychological distress, as reported elsewhere in detail (13). Both questionnaires were chosen for their reliability and validity and they had both already been validated in the healthy population and used in psychiatric patients, elderly people and groups with other medical conditions (21-23) comparable with the liver transplant setting, since no specific standardized instruments for QOL evaluation in transplant recipients are available at this time.

• LEIPAD

The *LEIPAD* consists of 25 items evaluating six areas: 1. *Physical functioning (PHY)*: 5 items. The score range from “no complaints” to “extreme complaints”; 2. *Self care (S-C)*: 7 items. The score ranges from “no problem” to “unable to care for oneself”; 3. *Depression and Anxiety (D-A)*: 4 items, from “no anxiety or depression” to “extreme anxiety and depression”; 4. *Cognitive Functioning (C-F)*: 5 items which

are scored from “no problems” to “extreme problems”; 5. *Social Functioning (S-F)*: 3 items, dealing with social integration and satisfaction, ranging from “high satisfaction” to “extreme dissatisfaction”; 6. *Life Satisfaction (L-S)*: 6 items reflecting satisfaction with different aspects of living, measuring attitude to present situation and anticipated future from “high satisfaction” to “extreme dissatisfaction”.

Moreover, a global QOL evaluation is expressed by the *Total LEIPAD* score, which summarizes the results of the different sub-scales.

• BSI

The *BSI* comprises 53 items selected to reflect the 9 primary symptom dimensions: 1. *Somatization (SOM)*: reflecting psychological distress arising from perception of bodily dysfunction; 2. *Obsessive-Compulsive (O-C)*: focusing on ego-alien or unwanted thoughts and actions experienced by the patients as unremitting and irresistible; 3. *Interpersonal sensitivity (I-S)*: feelings of personal inadequacy and inferiority; 4. *Depression (DEP)*: a broad range of signs and symptoms of clinical depressive syndromes; 5. *Anxiety (ANX)*: a set of symptoms usually associated clinically with highly manifest anxiety; 6. *Hostility (HOS)*: a dimension organized around three categories of hostile behavior: thoughts, feelings and actions; 7. *Phobic anxiety (PHOB)*: fears relating to travelling, open spaces, crowds, public places or conveyances; 8. *Paranoid Ideation (PAR)*: a mode of thinking characterized by projection, hostility, suspiciousness, centrality and fear of loss of independence; 9. *Psychoticism (PSY)*: a continuum progressing from a mildly alien life style at one end to a frankly psychotic status at the other.

Moreover, as a single indicator of current distress levels, a General Severity Index (*GSI*) associated with the *BSI* combines information on the number of symptoms and the intensity of perceived distress.

Medical assessment

At the time of QOL assessment, patients underwent clinical evaluation, liver and kidney function tests (AST, ALT, ALP, gGT, total bilirubin, albumin, prothrombin time, urea, creatinine, Na⁺, K⁺) and viral infection marker assessment (HBsAg, antiHBs, antiHBcIgM, HBeAg, anti-HBe and HBV-DNA for HBV-infection; anti-D total Ig for HDV; anti-HCV ELISA III and qualitative HCV-RNA by PCR for HCV infection). All patients underwent liver biopsy 6 and 12 months after LT, or whenever prompted by abnormal liver function test findings.

Immunosuppressive treatment consisted of cyclosporin A or tacrolimus. In all patients, steroids were withdrawn no later than 3 months after LT. Azathioprine was used in patients with impaired renal function (creatinine blood level > 200 µmol/dl). Acute cellular rejection was treated with boluses of steroids

Table 2. — *LEIPAD* scores (mean \pm SD) in different areas for any time intervals before and after liver transplantation

Areas	Pre-LT	Post-LT			
		1 month	3 months	6 months	12 months
Physical Functioning	6.00 \pm 2.33	3.67 \pm 1.63*	3.13 \pm 2.69*	3.14 \pm 1.61*	3.16 \pm 1.19*
Self-Care	3.05 \pm 2.44	2.90 \pm 3.60	2.47 \pm 2.68	2.00 \pm 3.55	1.83 \pm 4.17
Depression and Anxiety	3.85 \pm 3.17	1.93 \pm 1.94*	1.47 \pm 1.89*	1.42 \pm 1.45*	1.50 \pm 2.54*
Cognitive Functioning	3.65 \pm 2.62	2.73 \pm 2.79*	2.87 \pm 1.69	2.36 \pm 1.64	2.58 \pm 1.88
Social Functioning	2.70 \pm 1.62	3.00 \pm 1.69	2.73 \pm 2.36	3.00 \pm 1.79	2.50 \pm 1.08
Life Satisfaction	6.00 \pm 3.17	5.00 \pm 2.30*	4.80 \pm 2.59*	5.21 \pm 2.29*	4.83 \pm 1.69*

* $p < 0.05$ vs pre-LT ; LT = liver transplantation.

(methylprednisolone 1 g/day iv. for 3 days). Cyclosporin or tacrolimus blood levels were measured at the scheduled control points after LT.

Medical complications were evaluated in patients on the waiting list (gastrointestinal hemorrhage, infections, osteoporosis, diabetes, ascites, peripheral edema, pruritus and jaundice) and then after transplantation (infections, hypertension, osteoporosis, gingival hyperplasia, headache and tremors) ; they were scored semi-quantitatively (0 = absent ; 1 = mild ; 2 = moderate ; 3 = severe). All medical complication were clinically evaluated, except for osteoporosis, which was defined on the basis of bone mass density (BMD) in the lumbar spine L2-L4 < 0.800 g/cm².

Statistical analysis

Both for the *BSI* and for the *LEIPAD*, numerical scores were assigned to each question, then the scores were added to obtain global scores for each category, expressed as means \pm SD. The lower the score, the higher the level of perceived QOL for all categories (24,25). Analysis of variance (ANOVA), post-hoc analysis (LSD test) and Wilcoxon's test were used to compare *LEIPAD* and *BSI* category scores at different time points. Wilcoxon's signed rank tests were used to explore associations between medical data (physical and biochemical variables) and QOL. A p value of $< \text{or} = 0.05$ was considered significant.

Results

Quality of life

• *LEIPAD*

a. Total *LEIPAD*

Total *LEIPAD* scores in patients listed for LT and 1, 3, 6 and 12 month after LT are shown in Figure 1. Compared with pre-LT findings, total *LEIPAD* scores showed significantly better values at 1, 3, 6 and 12 months after LT ($p < 0.05$).

b. *LEIPAD* sub-scales

LEIPAD values in different areas are shown in Table 2. *Physical Functioning*, *Depression and Anxiety*, and *Life Satisfaction* scores were significantly lower

1 month after LT than before transplantation (*PHY* : $p < 0.000$; *DA* : $p = 0.041$; *LS* : $p = 0.031$ vs before LT). These scores also remain significantly lower in the follow-up at 3, 6 and 12 months (*PHY* : $p < 0.000$, *DA* : $p = 0.040$, *LS* : $p = 0.0087$ at 3 months ; *PHY* : $p < 0.000$, *DA* : $p = 0.0227$, *LS* : $p = 0.042$ at 6 months ; *PHY* < 0.000 , *DA* : $p = 0.036$, *LS* : $p = 0.0417$ at 12 months post-LT vs pre-LT).

Cognitive Functioning showed the same trend as the previous areas, with a significant difference 1 month after LT ($p = 0.026$ vs pre-LT). *Self Care* and *Social Functioning* scores did not change significantly after LT (vs pre-LT).

BSI

a) *Global Stress Index (GSI)*

GSI scores in patients listed for LT and 1, 3, 6 and 12 months after LT are shown in Figure 2. Compared with pre-LT findings, *GSI* values were significantly better 1, 3, 6 and 12 months after LT ($p < 0.05$).

b) *BSI* sub-scales

BSI scores in different areas are given in Table 3. *Interpersonal Sensitivity* and *Paranoid Ideation* were significantly better at all stages in post-LT follow-up than before LT (*IS* : $p = 0.0070$, $p = 0.0311$, $p = 0.0024$, $p = 0.0041$; *PAR* : $p = 0.0211$, $p = 0.0013$, $p = 0.0078$, $p = 0.0287$ respectively 1, 3, 6 and 12 months after LT vs before LT).

Depression and *Hostility* scores were significantly better 1, 3 and 6 months after LT (*DEP* : $p = 0.0198$, $p = 0.0273$, $p = 0.0139$; *HOS* : $p = 0.0035$, $p = 0.030$, $p = 0.020$ 1, 3 and 6 months after LT vs before LT, respectively). *Obsession-Compulsion* and *Psychoticism* were significantly better 3 months after LT (*OC* : $p = 0.0067$, *PSY* : $p = 0.0273$ vs pre-LT). No significant differences were found for *Anxiety*, *Somatization* and *Phobic Anxiety* at any time after LT vs pre-LT values.

Correlations between QOL and medical complications

a. *Before transplantation*

The severity of liver disease was classified according to Child-Pugh score (A = 1 ; B = 14 ; C = 10 patients). Medical complications in patients listed for LT were :

Table 3. — *BSI* scores (mean \pm SD) in different areas for any time intervals before and after liver transplantation

Areas	Pre-LT	Post-LT			
		1 month	3 months	6 months	12 months
Somatization	0.67 \pm 0.47	0.48 \pm 0.42	0.50 \pm 0.39	0.41 \pm 0.53	0.47 \pm 0.47
Obsession-Compulsion	0.60 \pm 0.46	0.49 \pm 0.43	0.35 \pm 0.22*	0.33 \pm 0.31	0.46 \pm 0.53
Interpersonal Sensitivity	0.52 \pm 0.63	0.27 \pm 0.40*	0.20 \pm 0.13*	0.14 \pm 0.23*	0.25 \pm 0.14*
Depression	0.61 \pm 0.55	0.29 \pm 0.23*	0.28 \pm 0.21*	0.27 \pm 0.30*	0.29 \pm 0.39
Anxiety	0.59 \pm 0.36	0.49 \pm 0.47	0.38 \pm 0.22	0.33 \pm 0.37	0.30 \pm 0.49
Hostility	0.75 \pm 0.56	0.44 \pm 0.36*	0.37 \pm 0.28*	0.21 \pm 0.21*	0.35 \pm 0.56
Phobic Anxiety	0.26 \pm 0.24	0.17 \pm 0.27	0.07 \pm 0.17	0.04 \pm 0.08	0.17 \pm 0.30
Paranoid Ideation	0.63 \pm 0.54	0.33 \pm 0.34*	0.16 \pm 0.21*	0.16 \pm 0.19*	0.23 \pm 0.41*
Psychoticism	0.48 \pm 0.53	0.45 \pm 0.37	0.24 \pm 0.19*	0.20 \pm 0.20	0.32 \pm 0.44

* $p < 0.05$ vs pre-LT ; LT = liver transplantation.

ascites in 11 patients, peripheral edema in 9, pruritus in 7, jaundice in 13, diabetes in 6, osteoporosis in 11, gastrointestinal hemorrhage in 4 and infections in 3.

In the cirrhotic patients, none of the QOL domains in the *BSI* or *LEIPAD* correlated with liver or kidney function tests, Child-Pugh score, or medical complication scores.

b. After transplantation

In the first 3 months after LT, 8 patients reported the onset of medical complications related to the immunosuppressive therapy : tremors in 4 patients (n = 3 score 1 ; n = 1 score 2 ; n = 0 score 3) ; headache in 3 (n = 2 score 1 ; n = 1 score 2 ; n = 0 score 3), gingival hyperplasia in 5 (n = 3 score 1 ; n = 1 score 2 ; n = 1 score 3). Osteoporosis was recorded in 13 patients (n = 3 score 1 ; n = 6 score 2 ; n = 2 score 3) and diabetes in 7 (n = 2 score 1 ; n = 4 score 2 ; n = 1 score 3). Seven patients reported more than one complication.

Immunosuppressive treatment was cyclosporin in 20 patients and tacrolimus in 5 patients. None of the patients had suffered any acute rejection episodes at the time of QOL evaluation.

None of the QOL domains in the *BSI* and *LEIPAD* evaluation correlated with liver or kidney function tests, cyclosporin or tacrolimus blood levels, number of medical complications or medical complication scores at any time after LT.

• Etiology of liver disease

a. HCV infection

Eight patients out of 25 had LT for HCV-related cirrhosis ; they all remained anti-HCV positive after surgery, while HCV-RNA was positive in 7 cases (87.5%). Histologically-proven recurrent HCV-related liver disease was seen in 5 (62.5%) patients and was graded as mild changes in 4 cases (80%), chronic hepatitis in 1 (20%). None of the patients with histologically-proven HCV recurrence were given antiviral therapy with Interferon (IFN) or pegylated-IFN and ribavirin.

Anti-HCV positive patients listed for LT had worse QOL levels than either the group of patients as a whole ($p = 0.045$) or the ALD patients ($p = 0.002$) (Fig. 3).

After transplantation, QOL assessed by Total *LEIPAD* score did not improve significantly over pre-LT values in the first 3 months after surgery ($p > 0.05$), whereas a significantly better QOL was seen after 6 and 12 months ($p < 0.05$ vs pre-LT) (Fig. 3). Psychological distress as assessed by *GSI* improved significantly at all times after LT ($p < 0.05$ vs pre-LT values) (Fig. 4), but was significantly worse 12 months after LT than after 6 months ($p = 0.0036$).

Anti-HCV positive patients had statistically worse *GSI* and Total *LEIPAD* values 1 and 3 months after LT than the global group scores (*GSI* : $p = 0.00024$, $p = 0.0028$; Total *LEIPAD* : $p = 0.00034$, 0.000012 at 1 and 3 months) (Fig. 3, 4).

After transplantation, anti-HCV positive patients had significantly lower total *LEIPAD* scores and *GSI* scores than ALD patients at 1 and 3 months ($p < 0.05$) (Fig. 3, 4).

b. Alcoholic liver disease

Eight patients out of 25 had liver transplantation for alcoholic liver disease ; they had all abstained from alcohol for at least 6 months before being listed for LT. None of the patients began drinking again up to 12 months after LT.

ALD patients listed for LT had better QOL scores than either the group of patients as a whole ($p = 0.036$) or the HCV patients ($p = 0.002$) (Fig. 3). After transplantation, both overall QOL (Total *LEIPAD* score) and psychological distress (*GSI*) significantly improved at 1, 3, 6 and 12 months by comparison with pre-LT values (Fig. 3, 4). *GSI* scores at 12 months were significantly worse than 1, 3 and 6 months after LT, however ($p < 0.05$).

ALD patients had significantly better Total *LEIPAD* scores than the patients as a whole 1 ($p = 0.002$) and 3 ($p = 0.04$) months after LT. No differences were seen at any time in *GSI* scores between ALD patients and the group of patients as a whole (Fig. 4).

After transplantation, ALD patients had significantly better Total *LEIPAD* scores and *GSI* scores at 1 and 3 months ($p < 0.05$) than anti-HCV positive patients (Fig. 3, 4).

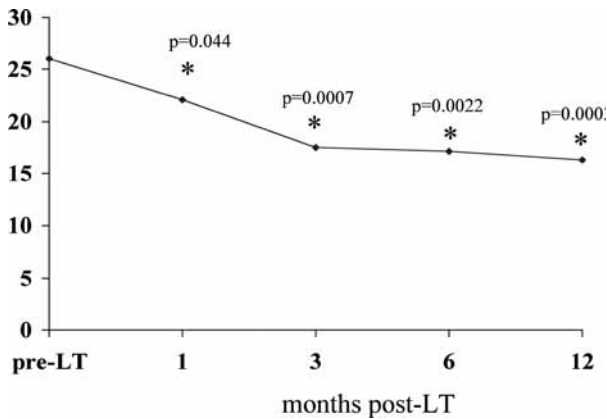


Fig. 1. — Overall Quality of Life (QOL) in patients listed for liver transplantation (pre-LT) and at different intervals after LT, expressed by Total *LEIPAD* scores. The lower the score, the better the perceived QOL, which improved significantly in most patients after LT (* $p < 0.05$ vs pre-LT).

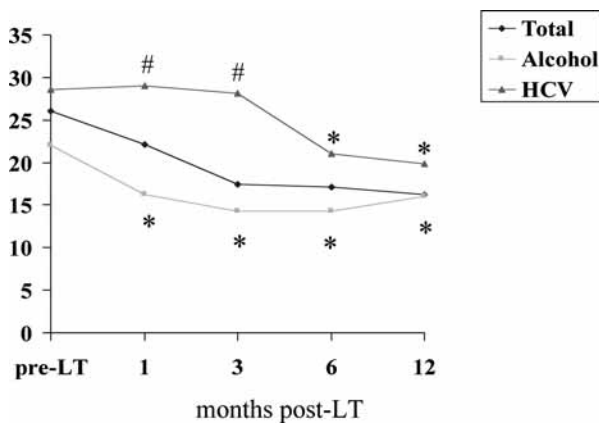


Fig. 2. — Psychological distress in patients listed for liver transplantation (pre-LT) and at different intervals after LT, expressed by *GSI* scores. The lower the score, the lower the psychological distress, which improved significantly in most patients after LT (* $p < 0.05$ vs pre-LT).

Discussion

The results of this study confirm that most QOL domains improve after liver transplantation. Our study focused on a general assessment of QOL (as measured by the *LEIPAD*) and psychological distress perceived by patients (as measured by the *BSI*) to integrate overall QOL perception after LT with any psychological and emotional changes.

Cirrhotic patients listed for liver transplantation have a poor QOL and a low level of perceived well-being. They complain of many physical disorders due to their end-stage liver disease, complications of cirrhosis and therapeutic measures; non-life-threatening symptoms, such as muscle cramps and pruritus, arouse major con-

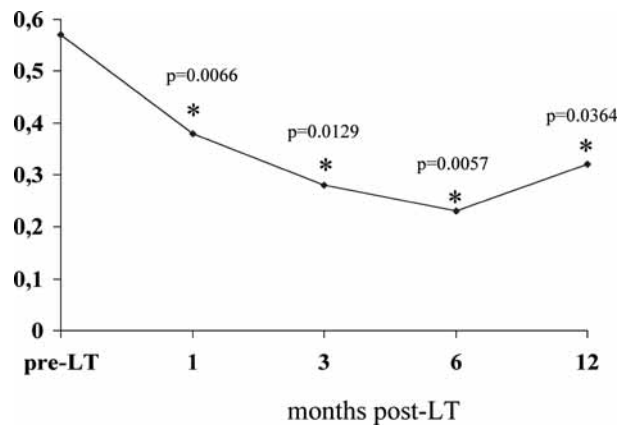


Fig. 3. — Quality of life (QOL) at different times before and after liver transplantation (LT) in patients with HCV-related liver disease (HCV) and alcoholic liver disease (ALD) compared with total patients (Total), assessed by *Total LEIPAD* score.

QOL significantly improved at most times after LT in both HCV and ALD patients (* $p < 0.05$ vs pre-LT). HCV patients had significantly lower QOL than ALD patients and the overall group of patients at 1 and 3 months post-LT (# $p < 0.05$ vs Total and ALD patients at the same controls).

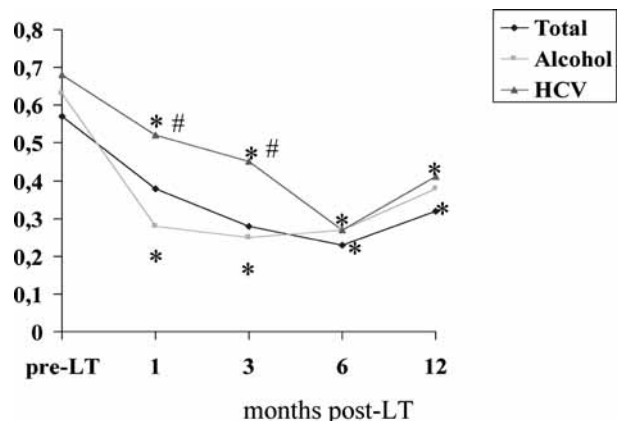


Fig. 4. — Psychological distress at different times before and after liver transplantation (LT) in patients with HCV-related liver disease (HCV) and alcoholic liver disease (ALD) compared with total patients (Total), expressed by *GSI* scores. Psychological distress significantly improved at all times after LT in both HCV and ALD patients (* $p < 0.05$ vs pre-LT). HCV patients had significantly greater psychological distress than ALD patients and the group of patients as a whole 1 and 3 months after LT (# $p < 0.05$ vs Total and ALD patients at the same times).

cern (24). Patients experience severe psychopathological distress due to their awareness that LT offers a solution to their life-threatening disease, but the scarcity of donor organs is such that most of them will probably not be transplanted before their clinical conditions deteriorate, causing their exclusion from the waiting list or death.

Self-assessed health perception was significantly better in almost all patients after transplantation and this is consistent with previous observations (2-9,13). However, both *LEIPAD* and *BSI* subscales confirmed that this improvement is more evident in physical and psychological domains and it occurs soon after LT, becoming evident already in the first month after surgery. Most patients had been chronically ill long before transplantation and, in the later stages, their lives had been at risk. Transplantation is thus perceived as a "miracle" or marvelous achievement that opens up new prospects for the future. The high health-related QOL score at a time when patients still have considerable physical problems may express a sort of post-transplant euphoria, an over-reaction to their regained health. In such a situation, even slightly more physical complaints (as long as they do not rise above a critical level) seem to be tolerable and are neutralized by the sense of having survived or been born again. Worries about complications or fear of death have to be avoided, so proclaiming their well-being may be seen as a specific defense mechanism against anxiety at this early stage. Such psychological defense mechanisms presumably play an important part in the excellent QOL scores and the euphoric mood of the early postoperative phase.

During the first year after transplantation, QOL remains significantly better than before LT, but patients show some problems in social domains (*Social Functioning* in *LEIPAD*) and psychological distress (*Anxiety*, *Somatization*, *Phobic Anxiety* in *BSI*). These findings may express their difficulty in adapting to post-transplant conditions, when they have to face both physical problems due to medical complications and the psychological problems of accepting their new bodily integrity, their dependence on drugs and medical staff, and problems in the social and working setting. Patients are highly insecure and anxious about their new life with the foreign organ. This condition develops when they have yet to elaborate acceptance and coping mechanisms to achieve a new psychological and emotional stability. The theory that psychopathological acceptance of transplantation does not coincide with the biological acceptance of the graft (13,25,26) is confirmed by our data, showing that physical functioning (as expressed by liver and kidney function tests, and medical complications) did not correlate with any QOL domains.

The novel result of the present study lies in the influence of the etiology of liver disease – HCV infection and ALD – on QOL after LT. In our study, patients with HCV infection had a significantly lower QOL and higher psychological distress after transplantation than the other patients. HCV recurrence after transplantation is considered a major determinant of QOL (12,27,28). In a cross-sectional study, we previously reported on an association linking histologically-proven recurrent HCV infection and post-transplant liver disease to psychological distress in the areas assessing depression, anxiety, phobic anxiety and paranoid ideation (13). In this longi-

tudinal prospective study, we show that HCV infection *per se* remarkably affects health perception soon after transplantation. The HCV-positive patients' already lower QOL while on the waiting list for LT failed to improve in the first 3 months after LT - a finding consistent with a previous report on QOL being worse in patients with chronic HCV infection, even in the absence of cirrhosis (29). In the transplant setting, the globally low positive effect of surgery in this group of patients may express their fear of HCV recurrence in the new allograft due to their HCV-RNA positivity after LT. This hypothesis is suggested by the increase in psychological distress a year after surgery, despite the overall improvement in QOL.

Patients transplanted for ALD had a better perceived QOL and less psychological distress than anti-HCV positive patients. Transplanted alcoholics reportedly do as well as non-alcoholic transplant patients: despite 10-50% rates of alcohol relapse within 3 years of transplantation, QOL scores are high in this group of patients, much the same as the levels expected in the normal population (15,16,30).

Our data have limitations that need to be acknowledged, however. Our sample of 25 patients was rather small, although statistically significant differences in QOL and psychological distress were identified. A further analysis of the impact of alcoholic relapse and histologically-proven HCV hepatitis recurrence after transplantation was not performed because of the small number of cases.

As for the possible influence of therapy on QOL, there is a reported association between immunosuppressive agents and new-onset or recurrent neurological and psychological changes (10,11). In our study, neither cyclosporin nor tacrolimus correlated with any of the QOL domains, however. Steroid therapy (which may be associated with a variety of psychological effects, including irritability, changeable mood, depression and impaired concentration and attention [11]) was withdrawn within 3 months after transplantation in all of our patients. Moreover, none of the patients had suffered any episodes of acute rejection at the time of QOL evaluation, so neither steroid therapy nor steroid rejection treatment should have affected the QOL changes we observed.

In conclusion, the results of our study confirm that liver transplantation can be quite successful in restoring QOL, restoring people to stable self-perceived health and activity levels. QOL evaluation may not only facilitate the selection of patients for surgery, but also help plan the timing of any need for rehabilitation, psychosocial support and other services after liver transplantation, particularly in the setting of HCV-related disease.

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