ELSEVIER

Correlation Between Fibroscan, Liver Biopsy, and Clinical Liver Function in Patients With Hepatitis C Virus Infection After Renal Transplantation

R. Muñoz, E. Ramírez, I. Fernandez, A. Martin, M. Romero, E. Romero, B. Dominguez-Gil, A. Hernandez, E. Morales, A. Andres, G. Castellano, and J.M. Morales

ABSTRACT

Hepatitis C virus (HCV) infection is the most important liver disease (LD) after renal transplantation. Liver biopsy is the gold standard for the diagnosis and follow-up of LD. The aim of this retrospective study was to evaluate the correlation between values of Fibroscan (EchoSens, Paris, France), a new noninvasive method to assess liver fibrosis, liver biopsy, and clinical data among HCV-positive renal transplant patients. Twenty-four HCV/RNA-positive patients with a previous liver biopsy were selected to undergo Fibroscan (transient elastography) and a clinical evaluation of liver function. Fibroscan values were expressed in kilopascals (kPa). As 2 patients were eliminated due to obesity or ascites, we analyzed 22 patients. Thirteen patients (59%) with fibrosis F0–F1 (METAVIR score) by biopsy and normal liver function showed a mean Fibroscan score of 5.2 kPa (range, 2.3–6.8 kPa). Three patients (13.6%) exhibited F2 by biopsy and normal liver function with a mean Fibroscan score of 8.2 kPa (range, 7.3–8.9 kPa). Three patients (13.6%) with F3 by biopsy and abnormal liver function showed a high mean Fibroscan score of 10.9 kPa (range, 10.5–11.6 kPa). The last 3 patients (13.6%) with F4 (cirrhosis) by biopsy and abnormal clinical data showed the highest mean Fibroscan value of 14.2 kPa (range, 8.9–18 kPa). In conclusion, among renal transplant patients with HCV the values of Fibroscan seem to correlate with the degree of fibrosis by biopsy and with clinical liver function. Therefore, Fibroscan may be useful to follow patients with LD. However, these results should be analyzed with caution due to the small number of cases and retrospective nature of the study.

HEPATITIS C VIRUS (HCV) infection is the most important liver disease after renal transplantation. In addition, HCV infection is an independent risk factor for graft loss and death among renal transplant patients. Despite this, renal transplantation is the best therapeutic option for HCV-positive patients with end-stage renal disease.[1,2] Liver disease after grafting can progress in some patients to cirrhosis; liver biopsy is the gold standard for the diagnosis and follow-up of chronic liver disease (CLD). Recently, Fibroscan, a noninvasive method to assess liver fibrosis, has emerged as a feasible option for the diagnosis and follow-up of patients with chronic hepatitis.[3] However, there is no information concerning renal transplant patients with liver disease. The aim of this retrospective study was to evaluate the correlation between Fibroscan values, transient elastography, and the degree of fibrosis by liver biopsy as well as the clinical data among renal transplant patients.

PATIENTS AND METHODS

This observational, retrospective study of 24 selected renal transplant patients with HCV infection had inclusion criteria of ongoing HCV infection (positive HCV RNA in the serum), a previous liver biopsy, and a complete clinical analysis, mainly serum transaminases, especially alanine aminotransferase (ALT) and prothrombin time at the time of the Fibroscan. Informed consent was obtained from all patients to use Fibroscan.

Two patients were excluded due to ascites or obesity. Therefore, 22 renal transplant patients were finally evaluated: 15 men and 7 women of overall mean age of 53.47 ± 10.56 years (mean time of transplant function, 12.17 ± 7.62 years). The immunosuppressive

From the Gastroenterology and Nephrology Departments, Hospital 12 de Octubre, Madrid, Spain.

Address reprint requests to Jose M. Morales, Nephrology Department, Hospital 12 de Octubre, Avda de Cordoba s/n, 28041 Madrid, Spain. E-mail: jmorales@h12o.es

0041-1345/09/$–see front matter
doi:10.1016/j.transproceed.2009.06.103

Table 1. Correlation Between Liver Fibrosis, Clinical Data, and Fibroscan in HCV-Positive Renal Transplant Patients

Liver Biopsy (N = 22)*	HCV RNA+	ALT Levels	Prothrombin Time	Portal Hypertension	Fibroscan (kPa)†
F0–F1 (n = 13)	All	Elevated: 1/13 (7.7%)	Normal values	None	5.2 ± 0.9 (2.3–6.8)
F2 (n = 3)	All	Elevated: 2/3 (67%)	Normal values	None	7.96 ± 0.6 (7.3–8.9)
F3 (n = 3)	All	CLD: 3/3 (100%)	Normal values	1/3 (33%)	10.9 ± 0.6 (10.5–11.6)
F4 (cirrhosis; n = 3)	All	CLD: 3/3 (100%)	Mean = 72% (range, 65%–80%)	All	14.2 ± 4.7 (8.9–18)

*Previous liver biopsy was performed in 7 cases within 2 years and in 15 cases more than 2 years before Fibroscan.
†Values are presented as means ± SDs (ranges).

regimen consisted of double therapy in 10 subjects, triple therapy in 11, and monotherapy in 1.

Fibroscan (EchoSens, Paris, France) was performed by 2 experienced hepatologists using a new method based on elastometry. The results were expressed in kilopascals (kPa) as previously published.[3] HCV RNA was determined and CLD defined as previously published.[1] The stage of fibrosis in the liver biopsy was assessed according to the METAVIR score: F0 = no fibrosis; F1 = portal fibrosis without septae; F2 = few septae; F3 = numerous septae; and F4 = cirrhosis.[4] Liver biopsy was performed in 7 cases within 2 years prior and in 15 cases more than 2 years prior to elastography.

RESULTS

Most patients had long-functioning renal transplants and were undergoing immunosuppression with double or triple therapy based on anticalcineurin drugs. This patient group exhibited positive HCV RNA in the serum; in 16 cases (73%) the liver values were normal. According to the liver biopsy, 13 (59%) showed normal or low-grade fibrosis (F0–F1); 13.6%, moderate fibrosis (F2); and the remaining 27%, severe fibrosis (F3–F4) with clinical data of CLD. Therefore, most patients exhibited mild to moderate CLD.

Table 1 shows the correlation between clinical data, liver fibrosis, and Fibroscan scores. In general, all patients with low Fibroscan scores (n = 13; 5.2 kPa) exhibited the lowest stage of liver fibrosis by biopsy accompanied by normal liver function. In contrast, patients with high Fibroscan scores (n = 6; >11 kPa) showed a severe form of liver fibrosis with CLD and portal hypertension from a clinical point of view. However, 1 patient with a 31-year functioning transplant showed a relatively low Fibroscan score (8.9 kPa) but criteria of CLD, including portal hypertension and cirrhosis.

DISCUSSION

This study of renal transplant patients with HCV infections and previous liver biopsies suggested that Fibroscan values were correlated with the degree of fibrosis. Therefore, Fibroscan may be useful as a noninvasive procedure to monitor liver disease. If this finding is corroborated, Fibroscan can be an inexpensive, safe procedure to follow liver disease among patients with CLD due to HCV infection.

Interestingly, among patients with mild liver disease (F0–F1), the values of Fibroscan were low, ie, no one with F0–F1 showed a mean value of more than 7 kPa. Among patients with severe CLD (F3–F4), the Fibroscan values were high and all except 1 exhibited values above 10.5 kPa. It is possible that in the intermediate stage of fibrosis the correlation may be more difficult.

This reported experience has several limitations: it was retrospective, it included a small number of patients, and some liver biopsies were performed several years prior to the Fibroscan and therefore the stage of fibrosis by a current biopsy could be higher. Despite this, the new information may be relevant. Fibroscan may be a new noninvasive tool to study and monitor CLD among renal transplant patients with HCV infection. To demonstrate the efficacy of this procedure requires prospective, multicenter studies.

REFERENCES

1. Morales JM, Campistol JM: Transplantation in the patient with hepatitis C. J Am Soc Nephrol 11:1343, 2000

2. Kamar N, Rostaing L, Selves J, et al: Natural history of hepatitis C virus related liver fibrosis after renal transplantation. Am J Transplant 5:1704, 2005

3. Fridich-Rust M, Onge M-F, Martens W, et al: Performance of transient elastography for the staining of liver fibrosis: a meta-analysis. Gastroenterology 134:960, 2008

4. The French METAVIR Cooperative Group: Inter- and intra-observer variation in the assessment of liver biopsy of chronic hepatitis C. Hepatology 20:15, 1994