

The socioeconomic impact of hepatitis C infection and liver transplantation in Mexico

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Hepatitis C virus is one of the most common causes of chronic liver disease and one of the principal indications for liver transplantation. Its prevalence and worldwide incidence varies, although there may be some similarities between different regions. Worldwide, the prevalence has been estimated to be approximately, 2.35% or 160 million infected people.¹

In Mexico, the prevalence of HCV infection has been estimated to be between 1.2 and 1.5%.^{2,3} Considering the current population of our country, 112 millions,⁴ and the age group older than 20 years (69 million), approximately 1 million are chronically infected with HCV. Furthermore, according to the natural history of HCV infection, 20 to 30% (200,000 to 300,000) of these patients can be expected to progress to liver cirrhosis. In addition, HCV is one of the leading causes of end-stage liver disease requiring liver transplantation. Major centers report that nearly 25-30% of their candidate pools consist of hepatitis C virus-infected patients.⁵ The pessimistic estimates mentioned regarding the prevalence of active HCV infection, and the proportion who might progress to cirrhosis, could be improved if those hepatitis C patients could be diagnosed and receive medical treatment in a timely manner. Moreover, excluding patients with compensated cirrhosis from treatment would reduce considerably the potential benefit on disease morbidity and mortality. Nowadays the combination treatment (pegylated interferon and ribavirin) achieve, at best, a sustained virologic response (SVR) in about 54 to 56% of treated cases.⁶ Fortunately, with the new drugs available

for the treatment of hepatitis C infection, such as direct-acting antiviral agents (DAA), the SVR will increase dramatically. The two first-generation protease inhibitors, boceprevir and telaprevir, have recently been approved for the treatment of chronic hepatitis C genotype 1. Triple therapy comprising pegylated interferon- α , ribavirin and boceprevir or telaprevir increases SVR rates to ~70-75% and shortens treatment duration in ~½ of treatment-naïve patients with chronic hepatitis C genotype 1.^{7,8} The SVR rates in treatment-experienced patients depend on the response to previous treatment, ranging from > 80% in previous relapsers to ~40% in previous non-responders.⁹

Now, what would happen if patients with HCV infection could not receive medical treatment for different reasons, including economic? Firstly, they would develop cirrhosis after a mean period of 20 years, and 1-4% of them would develop hepatocellular carcinoma annually (HCC) 30 years after infection.^{10,11} At present, in the United States with a total population of 313,592,613,¹² more than 16,000 patients are listed for liver transplantation on the United Network for Organ Sharing (UNOS) list, whereas approximately only 5,000 liver transplantations are performed per year. In adults, 40% of liver transplantations are performed for HCV cirrhosis. Unfortunately, contrary to what happens in the United States, in Mexico we have not accurate analyses to predict the number of liver transplantations that are needed. However, if we consider that the prevalence of hepatitis C in the United States is similar to that found in Mexico, we can infer that in Mexico, with population of 112 million, around 1,500 liver transplantations per year would be needed.

The picture is complicated, since currently the approximately cost of a liver transplant in Mexico is USD 150,000. Considering that 40% of them could be due to infection by HCV, it would require a total of 600 cases with a total cost of USD\$ 90,000,000 per year. Even after liver transplantation, it is

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*Manuscript received: April 25, 2012.
Manuscript accepted: May 16, 2012.*

important to mention that recurrent HCV infection occurs universally in patients undergoing liver transplantation for chronic HCV disease and they also need to be treated. In fact, twenty to forty percent of patients with recurrent HCV infection post-liver transplantation develop cirrhosis in 5 years. Decompensation occurs in 40% of these patients with cirrhosis within 1 year, and half of these patients die in the following year.

Considering all this information together we can say that HCV infection is a huge social, economic and public health problem for Mexico.

What we need to do? First, we need to screen appropriately all groups that are at high risk of infection with hepatitis C virus. Second, we need to treat the majority of infected patients in order to avoid and prevent the development of liver cirrhosis and its complications. A recent publication reported the cost-effectiveness of boceprevir or telaprevir for untreated patients with genotype 1 chronic hepatitis C.¹³ Third, we need to also treat those patients with compensated cirrhosis before a liver transplantation is required. This is a very important point because we can decrease or prevent the recurrence of HCV infection. Also, we can decrease the cost of medical treatment associated with the recurrence of HCV infection post-transplant, a cost that may include re-transplantation.

In conclusion, HCV infection in Mexico can be considered a significant public health problem and we need to design strategies to better identify and treat a high percentage of patients with hepatitis C infection regardless of socioeconomic status. Currently, we have new drugs to treat our patients and access to these drugs must be implemented. The cost effectiveness of the medical treatment has been validated in other countries and there is no reason to believe that they would not be cost-effective in Mexico. Finally, we need at least five liver transplantation centers distributed across the country to

successfully treat the majority of patients with decompensated cirrhosis, not only from hepatitis C but from all causes of liver disease, that require a life-saving liver transplant.

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