



# Treatment of Hepatitis C Virus Infection in the HIV- Infected Patients by Pegylated Interferon and Ribavirin in Tehran, Iran

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## Abstract

**Background and Objectives:** Considering reductions in AIDS-related mortalities following effective anti-retroviral treatments in HIV/AIDS patients, HCV-associated liver diseases have turned into a major concern for HIV/HCV co-infected patients. The present study aims at determining SVR rates in HIV/HCV co-infected patients under pegylated interferon and ribavirin treatment referring to Tehran Imam Khomeini hospital during 2010 - 2013.

**Methods:** In this descriptive cross-sectional study, all HIV/HCV co-infected patients under pegylated interferon and ribavirin treatment referring to Tehran Imam Khomeini Hospital during 2010 - 2013 entered the study. The variables include demographic information, genotype, liver involvement stage in biopsy, viral load levels prior to treatment, 4th, 12th, and 48th week as well as 6 months after treatment (sustained virologic response (SVR)), and CD4 count every 3 months.

**Results:** In the total of 28 male HIV/HCV co-infected patients of this study, 21.4% and 78.6% received peg IFN alfa- 2b, and pegIFN alfa- 2a, respectively. There were 17 genotype I (61%), 9 (32%) genotype III, and 2 (7%) genotype II among the patients. The overall SVR rate of the patients was 67.8%; it was 52.9% in genotype I and 72.7% in genotypes II and III. Despite the CD4 count decline during treatment, opportunistic infections were not observed in any of the patients

**Conclusions:** SVR rates in this study are higher than studies conducted in other countries and this implies the possibility of a more favorable genetic trait in Iranian HCV patients responding to pegIFN and ribavirin. That is still the proper regimen due to high price of free interferon regimens in Iran.

**Keywords:** HIV Infection, AIDS, Hepatitis C, Interferon-Alfa

## 1. Background

In the past decade, the effect of ART (antiretroviral therapy) substantially reduced AIDS (Acquired Immunodeficiency Syndrome) related mortality. Therefore, HCV (hepatitis C virus) related liver disease has become a major concern for patients with HCV co-infection (1) and end-stage liver disease has remained the main cause of death in these patients (2). Eradicating hepatitis C virus in HIV (Human Immunodeficiency Virus)/HCV co-infection patients is the best method of controlling liver disease progress (3).

For over a decade, the chief treatment of the HCV infection was a combination regimen of pegylated interferon (pegIFN) and ribavirin. Fast progress in producing anti-HCV drugs led to the discovery of a new class of DDA (direct

acting antiviral) agents that aimed at HCV replication cycle. The first DDA agents were the HCV protease inhibitors boceprevir and Telaprevir, subsequently a new drug of the same class (simeprevir) and a newer class (sofosbuvir, ledipasvir) approved (4). However, high cost of the over mentioned drugs has been a global barrier to their public use and they are not yet available in all parts of the world.

The present study aims at determining SVR rates in HIV/HCV co-infected patients under pegylated interferon and ribavirin treatment referring to Tehran Imam Khomeini Hospital during 2010 - 2013.

## 2. Methods

In this descriptive, cross-sectional study, records of all HIV/HCV co-infected patients under pegylated interferon and ribavirin treatment referring to Tehran Imam Khomeini hospital during 2010 - 2013 were gathered and the required information was extracted.

The variables are age, sex, genotype, ART history before/after treatment, liver involvement stage and grade in biopsy, viral load levels prior to treatment, 4<sup>th</sup> (rapid virologic response (RVR)), 12th (early virologic response (EVR)), and 48th (End of treatment response (ETR)) week as well as 6 months after treatment (sustained virologic response (SVR)), and CD4 count every 3 months in addition to the incidence of opportunistic infections.

The patients received 2 pegIFN (pegIFN alfa-2a and pegIFN alfa-2b) during the study.

The data was analyzed by the SPSS 16 software and using the t-test and Chi-Square test for analyzing quantitative and qualitative variables, respectively.

## 3. Results

The findings of the study show that during the course of the study, 28 patients underwent pegylated interferon and ribavirin therapy for hepatitis C. The patients were all male with the mean age of  $40.3 \pm 8.4$  years (range: 26 - 58). There were 25 (89.3%) patients with a positive drug injection history; 6 (21.4%) and 22 (78.6%) of the patients received pegIFN alfa-2b and peg IFN alfa-2a, respectively. Genotypes 1, 3, and 2 were observed in 17 (61%), 9 (32%), and 2 (7%) of the patients, correspondingly. None of the patients had HBV co-infection.

The mean CD4 count was  $518.16 \pm 298$  cell/mL. Among all, 20 (71.4%) patients received ART prior to the HCV treatment.

Half of the patients had HAI (hepatic activity index) 1 stage in their liver biopsy.

Overall, 50%, 72.7%, and 83.3% of the patients attained RVR, EVR, and ETR, respectively. The general SVR level was 67.8% and it was 52.9% and 72.7% in genotypes 1, and 2, 3 correspondingly. All patients attaining RVR, reached SVR.

The frequency of CD4 count depletion to less than 200 during the treatment period is demonstrated in [Table 1](#). Despite CD4 decline, no opportunistic infectious disease has been reported during the treatment of hepatitis C.

ART was started for 1 patient (3.6%) during the treatment period. Hepatitis C treatment was discontinued for 6 (21.4%) patients, among which, 4 were null responder and 2 could not tolerate.

CD4 count for 6 months after treatment was less than 200 cell/mL in 1 (3.5%) and 200 - 350 (17.8%) cell/mL after

**Table 1.** Frequency of CD4 < 200 During pegIFN and Ribavirin Course of Treatment

Frequency of CD4 < 200	Time of Measurement (CD4)
6 (21.4)	3th month of treatment
8 (28.5)	6th month of treatment
12 (42.8)	9th month of treatment
6 (21.4)	Treatment termination

hepatitis C treatment; ART was initiated for 5 patients after treatment of hepatitis C.

## 4. Discussion

Generally, SVR rates in the HIV/HCV co-infected are lower than HCV monoinfected patients. Among patients with HIV/HCV genotype 1 co-infection SVR rates have been nearly 14% to 40% (5-8). In our study, overall SVR rates by pegIFN and ribavirin regimen was 67.8%, and it was 52.9% and 72.7% in genotypes 1 and 2, 3, respectively.

In the study of Apricot, SVR rates in HIV-HCV co-infected patients under pegIFN alfa-2a and ribavirin treatment was 40%, and it was 28% and 62% in genotypes 1 and 2, 3, respectively (7). In the study of Barcaui HS et al. which was conducted on 100 HIV-HCV co-infected patients under pegIFN and ribavirin regimen treatment, SVR rates were 27% (9).

In another study, SVR rates following pegIFN alfa-2a and Ribavirin treatment were 22% and 62% in genotypes 1 and 2, 3, respectively and they were correspondingly 32% and 71% following the administration of pegIFN alfa-2b and Ribavirin in genotypes 1 and 2,3 (10). One reason for higher SVR rates in our study is the possibility of a more favorable genetic trait in Iranian HCV patients responding to pegIFN and ribavirin in Iran.

Researchers have detected a polymorphism (rs129798060) close to IL28B gene that encodes interferon lambda-3, which has a strong statistical relationship with response to IFN therapy (11, 12). In our study, all patients attaining RVR reached SVR and this shows that those getting to RVR can reach SVR in a significantly higher manner.

In the present study, despite the fact that absolute CD4 counts decline to less than 200 during the treatment, none of the patients developed opportunistic infections and ART was administered for 1 case (3.6%) due to CD4 percent decline.

### 4.1. Conclusions

Considering high price of free interferon regimens in Iran and proper response of the patients to pegIFN and

ribavirin treatment, it seems that the regimen is still an appropriate treatment for HIV/HCV co-infected patients in Iran. Further studies are required to compare the mentioned regimen to free IFN regimens in HIV/HCV co-infected patients considering SVR rates, as well as drug side effects and interactions.

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### Footnote

**Conflicts of interest:** Nil.

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