The impact of HIV coinfection on hepatitis C virus (HCV) treatment initiation

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Conflicts of interest: There are no disclosures for this project.
C Henegar, R Beckerman, and J Fusco are employees of Epividian, which collaborates on clinical research with physicians, health systems, pharmaceutical companies, biotech companies, and government entities.

BACKGROUND

- Despite the availability of highly effective direct-acting antivirals (DAAs; first DAA FDA approval: May 2011) for the treatment of hepatitis c virus (HCV), HCV remains a leading cause of cirrhosis, hepatocellular carcinoma, and liver-related mortality in the United States.[1,2]
- Due to shared risk factors for transmission, human immunodeficiency virus (HIV) and HCV coinfection is common.[3]
- Treatment of HCV is particularly important for HCV/HIV coinfected patients, who are at greater risk of HCV disease progression.[4]

OBJECTIVE:

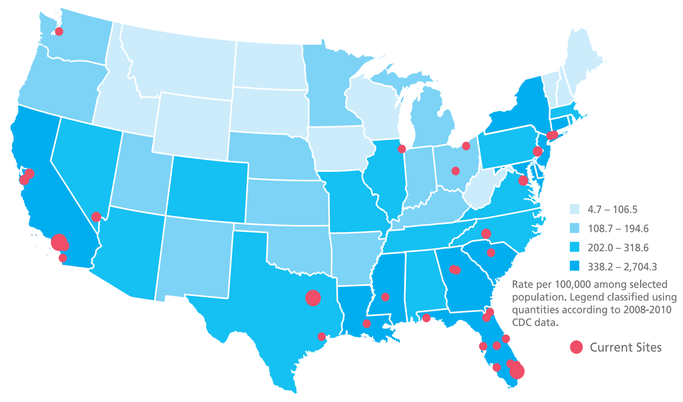
To evaluate and compare HCV treatment uptake and predictors of treatment initiation among patients with HCV monoinfection and HCV/HIV coinfection in the modern HCV treatment era (2011-2016).

METHODS

Study Population

- Selected from the OPERA database, which includes electronic health record data from patients in care at 79 clinics in 15 US states (Figure 1).

Figure 1. Geographic distribution of OPERA cohort



- All patients with a diagnosis of chronic HCV after their first active date in OPERA, occurring between January 1, 2011 and December 31, 2016.
- Patients diagnosed with HIV type 1 infection on or prior to their HCV diagnosis date were classified as HCV/HIV.

Measures

- Lab records for HCV RNA viral loads confirmed diagnoses of chronic HCV.
- The fibrosis-4 (FIB-4) score estimates the amount of scarring in the liver.

F0,1: none or mild; **F2:** moderate; **F3,4:** significant or severe

$$\textbf{FIB-4} = \frac{\text{[age (years) x aspartate aminotransferase (AST) level (U/L)]}}{\text{[Platelet count (10^9/L) x }\sqrt{\text{alanine aminotransferase (ALT) (U/L)]}}}$$

Study Design and Analysis

- Patients were followed from HCV diagnosis date to HCV treatment initiation, data freeze (Feb. 6, 2017), death, or loss to follow-up (>12 months with no clinic interactions), whichever date came first.
- Time to treatment initiation was evaluated using Kaplan-Meier methods.
- Cox proportional hazards models were used to estimate associations between baseline characteristics and HCV treatment initiation, by HIV status.

RESULTS

- From 759,440 patients in the OPERA cohort, 1,053 HCV and 1,307 HCV/HIV eligible patients were identified.

Table 1. Demographic and clinical characteristics at HCV diagnosis

	HCV N=1053	HCV/HIV N=1307	
	n(%)	n(%)	p-value
Sex			
Female	397 (37.8)	200 (15.3)	**<0.0001**
Male	655 (62.3)	1107 (84.7)	
Age			
<50 years	403 (38.3)	753 (57.6)	**<0.0001**
≥50 years	650 (61.7)	554 (42.4)	
Race			
African American	94 (8.9)	500 (38.3)	**<0.0001**
Not African American	959 (91.1)	807 (61.7)	
Ethnicity			
Hispanic	582 (55.3)	267 (20.4)	**<0.0001**
Not Hispanic	471 (44.7)	1040 (79.6)	
Baseline comorbidities[1]			
Mental Health Conditions[2]	164 (15.6)	338 (25.9)	**<0.0001**
Substance Abuse	192 (18.2)	336 (25.7)	**<0.0001**
Syphilis	23 (2.2)	444 (34.0)	**<0.0001**
Baseline Fib-4 Score[3]			
Score available	584 (55.5)	1160 (88.8)	**<0.0001**
Missing	469 (44.5)	147 (11.2)	
F0, F1	255 (43.7)	561 (48.4)	**0.001**
F2	198 (33.9)	422 (36.4)	
F3, F4	131 (22.4)	177 (15.3)	
HCV Genotype			
Available	733 (69.6)	900 (68.9)	**0.6**
Missing	320 (30.4)	407 (31.1)	
1a/1b	526 (71.8)	773 (85.9)	**<0.0001**
2,3	184 (25.1)	108 (12.0)	
4,5,6	23 (3.1)	19 (2.1)	

1. Diagnosed prior to or on the HCV diagnosis date
2. Mental health conditions: anxiety disorders, bipolar or manic disorders, major depressive disorder, schizophrenia, dementia, or suicidality
3. Fibrosis-4 score: calculated using age at HCV diagnosis, and platelet, AST, and ALT labs taken within 6 months prior to HCV diagnosis date

- During the study period, 28% (n=289) of HCV patients and 35% (n=453; p=0.0002) of HCV/HIV patients initiated any form of HCV treatment.
- Time between HCV diagnosis and treatment initiation was median (IQR) 10 (3,20) months for HCV/HIV patients and 6 (2,16) months for HCV patients.
- Nearly all (96%) treated patients were prescribed DAAs, rather than interferon-based therapy, in both the HCV and HCV/HIV groups.

Figure 2. Year of HCV treatment initiation among patients receiving treatment, 2011-2016

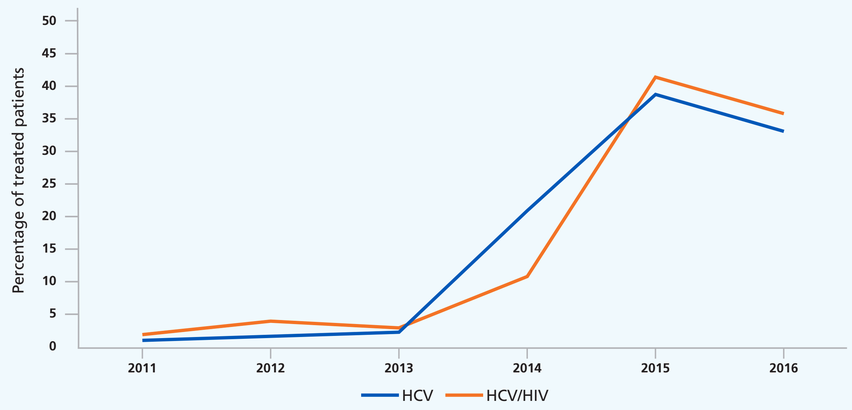


Figure 3. Kaplan-Meier estimates of HCV treatment initiation by HIV coinfection status

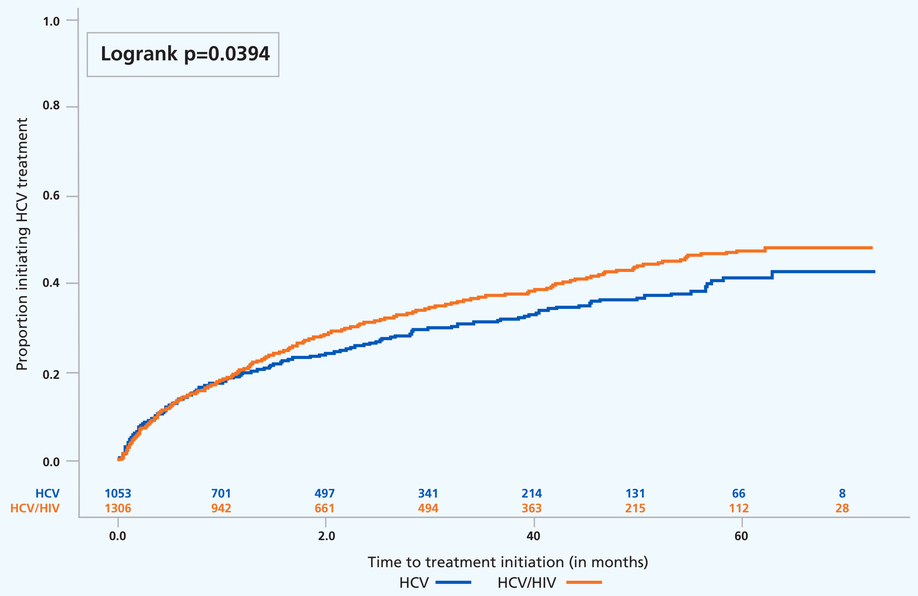
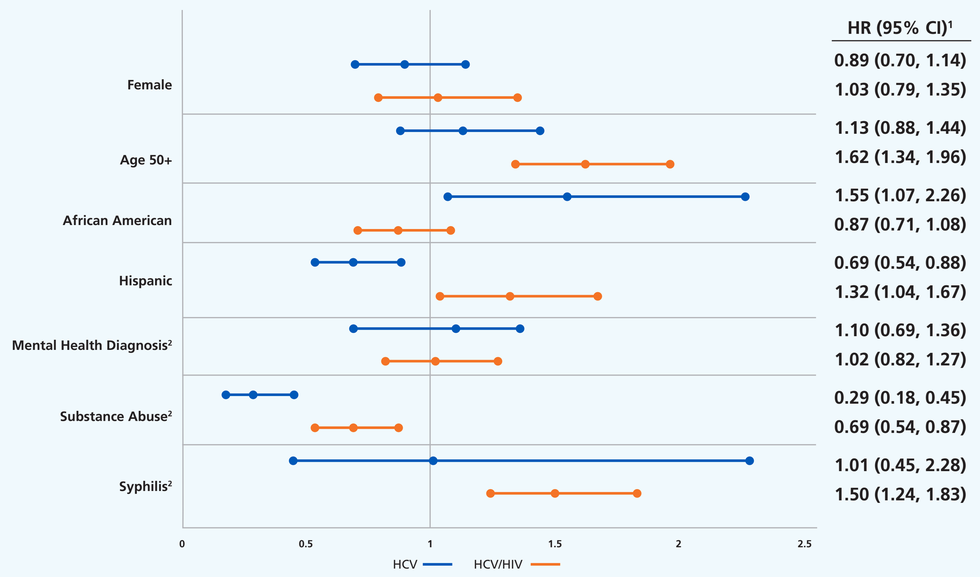


Figure 4. Multivariable associations for initiating HCV treatment among HCV and HCV/HIV patients diagnosed with chronic HCV



1. Hazard Ratio (95% Confidence Interval)
2. Includes any diagnosis occurring prior to or on the chronic HCV diagnosis date

- Among those with a Fib-4 score measured at treatment initiation, HCV/HIV patients were less likely to have severe liver fibrosis (HCV F3, F4: 24% vs. HCV/HIV: 14%, p=0.003).

CONCLUSIONS:

- While HCV/HIV patients were more likely to initiate HCV treatment, treatment uptake for all patients with chronic HCV in the OPERA cohort was low.
- Among the treated, a delay of several months between HCV diagnosis and treatment initiation was common, regardless of HIV status.
- HCV and HCV/HIV patients with a history of substance abuse were less likely to be treated for their HCV.
- Improved access to DAAs and prompt treatment initiation following diagnosis, especially for the most complex and vulnerable patients, is needed to reduce HCV-associated disease and HCV transmission.

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ACKNOWLEDGEMENTS

This research wouldn't be possible without the participation of HIV caregivers and their patients. Additionally, we are grateful for the following contributions: Gregory Fusco (clinical input, Advisory Board leadership), Rodney Mood (site selection and support), Ted Ising (database architecture and support), Bernie Stooks (database support), and Judy Johnson (clinical terminology classification).

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