

Prevalence of Hepatitis C Virus (HCV) Infection and Associated Comorbidity in the 2008-2014 US Hemodialysis Population

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Introduction

- US national prevalence of hepatitis C virus (HCV) infection was 1.67% in 2010 (Rosenberg et al., 2017).
- Hemodialysis (HD) patients are at high risk of HCV infection.
- HCV infection prevalence in the US HD population requires updating.

Objectives

- To describe the temporal changes in HCV infection prevalence each year in the 2008-2014 US HD population.
- To examine associations of prevalence of HCV infection with patient demographics and comorbidity.

Methods

- We used the 2007-2014 100% Medicare end-stage renal disease (ESRD) data. For each year (2008-2014), we required patients to have Medicare Parts A/B coverage, not to have Medicare Advantage, to be alive, and to be on HD on the first day of the year.
- Patients with hepatitis B virus (ICD-9-CM diagnosis codes 070.2x, 070.3x) were excluded. Using ICD-9-CM diagnosis codes 070.41, 070.44, 070.51, 070.54, 070.70, and 070.71, we defined HCV infection by ≥ 1 inpatient or outpatient claims.
- The baseline period, 1 year before each cohort year, was used to define comorbid conditions, including diabetes, liver disease (HCV was not considered a liver disease), human immunodeficiency virus (HIV), alcohol abuse, drug abuse, etc.
- Prevalence of HCV infection was reported as a percentage of HD patients.
- Logistic regression was used to examine association of HCV infection and patient demographics, cohort years, and comorbidity.

Results

Table 1. Baseline characteristics in 2012 US HD patients, by HCV infection status

Characteristics	HCV	Non-HCV	P value
Total HD patients in 2012	17,293	241,252	
Age, years	59.4	63.2	<.0001
Female, %	36.5	45.1	<.0001
Race, %			<.0001
White	42.6	56.9	
Black	52.5	37.5	
Other	4.8	5.6	
Primary cause of ESRD, %			<.0001
Diabetes	39.8	45.3	
Hypertension	31.1	29.1	
Glomerulonephritis	13.6	11.0	
Duration on dialysis, years			<.0001
<1	15.0	16.8	
1-5	45.0	49.2	
5+	40.0	34.0	
Baseline comorbidity			
Diabetes	61.6	64.0	<.0001
Cardiovascular disease	72.8	71.5	0.0001
Anemia	96.2	95.2	<.0001
Hypertension	86.4	83.3	<.0001
Hyperlipidemia	50.9	56.8	<.0001
Cancer	7.9	9.4	<.0001
Liver disease	19.1	7.4	<.0001
HIV	5.4	1.2	<.0001
Alcohol abuse	7.0	1.8	<.0001
Drug abuse	10.7	2.7	<.0001
Depression	21.5	17.7	<.0001
Gastrointestinal	11.9	8.3	<.0001
COPD	27.2	24.4	<.0001

Figure 1. Prevalence of HCV infection by selected characteristics, %

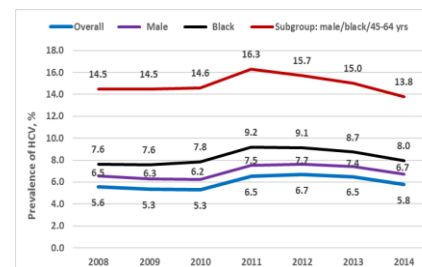
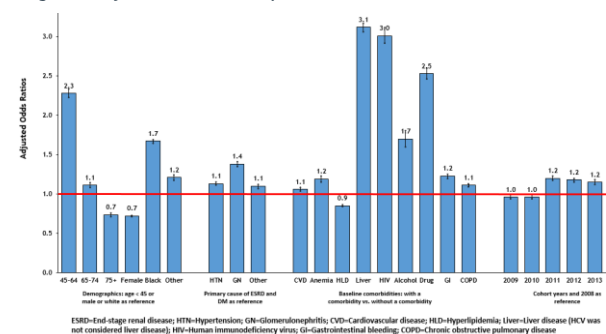


Table 2. Prevalence of HCV infection in 2008-2014 HD patients, %

Characteristics	2008	2009	2010	2011	2012	2013	2014
Overall	5.6	5.3	5.3	6.5	6.7	6.5	5.8
Age, years							
<45	5.6	5.0	4.7	5.5	5.2	4.9	3.7
45-64	8.9	8.7	8.7	10.2	10.2	10.0	9.0
65-74	3.4	3.3	3.3	4.4	4.9	4.8	4.4
75+	2.4	2.1	1.9	3.0	3.1	2.9	2.3
Sex							
Male	6.5	6.3	6.2	7.5	7.7	7.4	6.7
Female	4.4	4.2	4.1	5.3	5.5	5.3	4.5
Race							
White	4.2	3.9	3.7	4.7	5.1	5.0	4.4
Black	7.6	7.6	7.8	9.2	9.1	8.7	8.0
Other	4.8	4.1	4.0	5.9	5.8	6.3	4.4
Baseline comorbidity							
Diabetes	5.2	5.0	5.0	6.3	6.5	6.4	5.6
Cardiovascular disease	5.4	5.3	5.3	6.6	6.8	6.7	6.0
Anemia	5.6	5.4	5.4	6.6	6.8	6.6	5.8
Hypertension	5.7	5.5	5.5	6.7	6.9	6.8	6.0
Hyperlipidemia	5.3	4.8	4.9	5.8	6.0	6.0	5.3
Cancer	4.3	4.2	4.3	5.4	5.7	6.0	5.3
Liver disease	15.4	15.7	14.7	15.1	15.7	16.1	17.9
HIV	23.8	22.9	23.2	23.4	24.7	24.4	23.3
Alcohol abuse	19.3	19.5	21.7	23.8	21.6	21.4	21.4
Drug abuse	19.3	16.3	17.9	21.0	22.3	21.2	20.7
Depression	7.0	6.4	6.6	7.8	8.0	7.8	7.0
Gastrointestinal	7.2	6.7	7.4	8.9	9.3	9.3	8.9
COPD	5.6	5.4	5.6	7.0	7.4	7.3	6.9

Figure 2. Adjusted odds ratios of prevalence of HCV



Summary

- We included 230,000-270,000 patients each year. Baseline characteristics were similar across years.
- In the 2012 cohort, compared with non-HCV patients, those with HCV infection were more likely to be younger, male or of black race, with non-DM as ESRD cause, and with HTN, liver disease, HIV, alcohol or drug abuse, depression, or GI bleeding (Table 1).
- Average prevalence of HCV infection ranged from 5.3%-6.7% with higher prevalence during 2011-2013 (Table 2). Black male patients aged 45-64 years were at higher risk, ~15% (Figure 1). Patients with comorbid conditions were at high risk: 17.9%, liver disease; 23.3%, HIV; 21.4%, alcohol abuse; and 20.7%, drug abuse, in 2014 HD patients (Table 2).
- Adjusted analysis showed significant associations of HCV infection with covariates: e.g., adjusted odds ratio for age 45-64 (ref. < 45), 2.28; female, 0.72; black (ref. white), 1.67; liver disease, 3.12; HIV, 3.01; alcohol, 1.70, drug abuse, 2.53, and cohort years 2011 (ref. 2008), 1.20 (Figure 2).

Conclusions

- Average HCV infection prevalence in HD patients was about 5%-6%, much higher than in the general population.
- Prevalence of HCV infection in black male patients and patients with liver diseases, HIV, or drug abuse was 2-4 times the average.
- These results underscore the need for effective treatment and management of comorbid conditions and HCV infection in patients on dialysis.

Limitations

- The prevalence of HCV infection based on diagnosis claims might be underestimated due to lack of laboratory data and under-reporting.
- Hepatic-related outcomes and treatment were not evaluated in this study.

Reference

- Rosenberg et al. Estimation of state-level prevalence of hepatitis C virus infection, US states and District of Columbia, 2010. Clin Infect Dis. 2017;64:1573-1581.