



Treatment Uptake and Real World Effectiveness of Sofosbuvir/Ledipasvir and Paritaprevir/Ritonavir/Ombitasvir/Dasabuvir Among HCV-Infected Persons With Chronic Kidney Disease

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Introduction

- New direct-acting antiviral agents (DAA) have revolutionized treatment of HCV infection
- With newer DAA regimens, SVR rates of >90%-95% are the norm
- Patients with chronic kidney disease (CKD) were often not initiated on HCV treatment due to safety, tolerability, and efficacy concerns
- Newer DAA regimens are more safe, tolerable, and efficacious than the older interferon/ribavirin-based regimens, even in the CKD population
- While treatment initiation rates in the CKD population in the interferon/ribavirin era were low, such data are lacking in the DAA era

Aims

- To determine treatment initiation rates and effectiveness with the sofosbuvir/ledipasvir (SOF/LDV) and paritaprevir/ritonavir/ombitasvir/dasabuvir (PrOD) regimens among persons with HCV/CKD
- To assess factors associated with SOF/ODV or PrOD treatment initiation in HCV/CKD patients

Methods

- We used the Electronically Retrieved Cohort of HCV Infected Veterans (ERCHIVES), a well-established national cohort of HCV-infected persons and age-, sex-, and race-matched controls who received care within the Veterans Health Administration (VHA)
- Demographic, clinical, laboratory, pharmacy, utilization, and vital status data were retrieved from VHA's Corporate Data Warehouse
- Included all HCV RNA+ persons with ≥2 available eGFR 3 months apart and prior to baseline and at least 1 eGFR value ≥12 weeks after baseline. eGFR was estimated using the CKD-EPI equation
- Excluded HIV- and hepatitis B surface antigen-positive persons
- CKD stages were categorized using the National Kidney Foundation criteria
- Treatment initiation was defined as a prescription of SOF/ODV or PrOD for >14 days
- Severity of liver disease was estimated using the FIB-4 score, with cirrhosis defined as FIB-4 score >3.5
- Baseline characteristics were compared by CKD stages
- Factors associated with treatment initiation were determined using logistic regression analysis
- SVR was defined as the proportion of persons with undetectable HCV RNA >12 weeks after treatment completion

Results

Figure 1. Study flow sheet

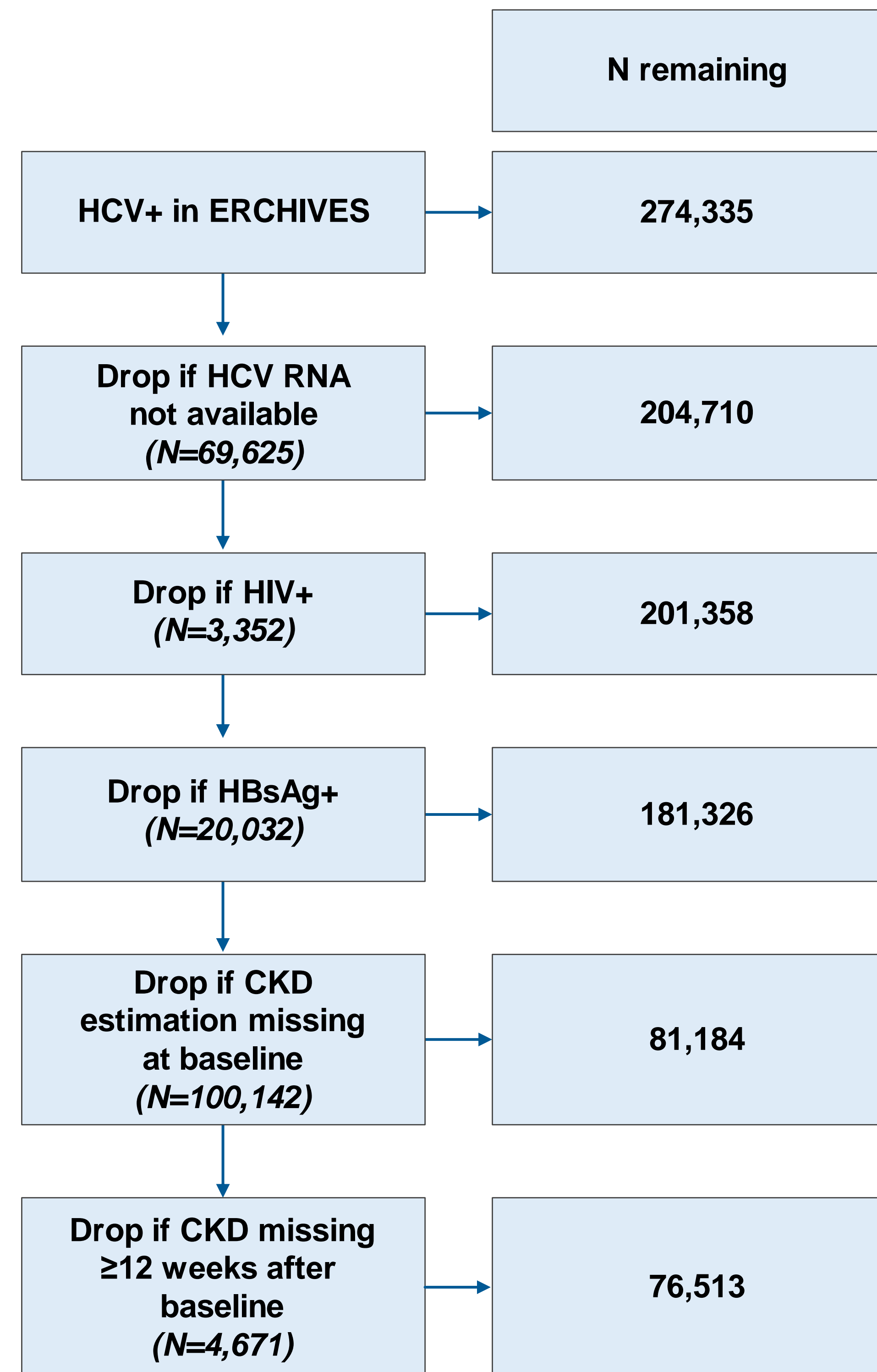


Table 1. Baseline characteristics

Characteristic	CKD Stage 1-2 N=68,469	CKD Stage 3 N=6,086	CKD Stage 4-5 N=1,958
Age, median [IQR]	53 (49, 58)	59 (54, 67)	57 (53, 63)
Race/ethnicity, %			
White	55.15	51.69	32.74
Black	32.67	34.80	56.59
Hispanic	4.30	4.12	4.24
Other	7.88	9.38	6.44
Sex (M), %	96.67	96.88	98.01
HCV RNA, log ₁₀ , median [IQR]	6.04 (4.32, 6.92)	5.93 (3.01, 6.85)	5.89 (3.69, 6.77)
HCV genotype, %			
1a	26.85	19.96	19.87
1b	9.58	9.79	8.07
2	4.50	4.01	2.45
3	3.13	1.63	0.66
4/5/6	0.32	0.18	0.15
Mixed	0.12	0.12	0.05
Missing	55.49	64.31	68.74
Body mass index, median [IQR]	26.88 (23.8, 30.5)	27.61 (24.3, 31.2)	26.57 (23.2, 30.8)
Diabetes, %	17.67	32.71	53.42
CVD, %	8.94	27.26	42.13
Alcohol abuse/dependence, %	43.58	29.23	26.10
FIB-4 score, median [IQR]	1.54 (1.0, 2.5)	1.91 (1.3, 3.1)	1.68 (1.1, 2.7)
Cirrhosis, %	14.78	20.69	14.30
Hepatic decompensation, %	0.77	1.27	1.63
eGFR, median [IQR]	90.64 (79.0, 101.7)	50.9 (43.5, 56.2)	12.99 (7.1, 22.2)
ACE-I/ARB use overall, %	6.52	15.54	25.38

Table 2. Treatment uptake and SVR12 of SOF/LDV and PrOD regimens, by CKD stage

	All stages	CKD Stage 1-2	CKD Stage 3	CKD Stage 4-5
Number of patients with HCV/CKD	76,513	68,469	6,086	1,958
Patients who initiated SOF/LDV or PrOD	6,715 (8.8%)	6,317 (9.2%)	352 (5.8%)	46 (2.3%)
Number and rate of SOF/LDV + or - RBV initiation	5,181 (6.8%)	4,878 (7.1%)	267 (4.4%)	36 (1.8%)
Number of patients who initiated PrOD + or - RBV	1,534 (2.0%)	1,439 (2.1%)	85 (1.4%)	10 (0.5%)
SVR12 (SOF/LDV or PrOD regimens)	93.9% (2,709/2,885)	93.8% (2,545/2,712)	94.8% (164/173)	

Results (continued)

Table 3. Factors associated with treatment initiation

Characteristic	OR	95% CI
Age, per 10-year increase	1.08	(1.05, 1.12)
Race/ethnicity: White (comparator)	1	-
Black	1.03	(0.97, 1.09)
Hispanic	0.90	(0.78, 1.04)
Male sex (compared to female)	0.84	(0.74, 0.97)
HCV RNA, per log ₁₀ , increase	1.09	(1.08, 1.11)
HCV genotype 1a (comparator)	1	-
1b	1.05	(0.98, 1.13)
2	0.02	(0.01, 0.04)
3	0.35	(0.29, 0.40)
4/5/6	0.76	(0.44, 0.96)
Body mass index, per unit increase	1.03	(1.02, 1.03)
Diabetes	0.83	(0.78, 0.90)
Cardiovascular disease diagnosis	0.75	(0.67, 0.82)
Alcohol abuse or dependence	0.76	(0.72, 0.80)
Moderate to severe anemia (Hb<10)	0.68	(0.54, 0.86)
Cirrhosis at baseline (by FIB-4 >3.5)	1.15	(1.07, 1.23)
CKD stage 1-2 (comparator)	1	-
CKD stage 3	0.66	(0.59, 0.73)
CKD stage 4-5	0.28	(0.21, 0.38)

Conclusions

- Treatment uptake for HCV with SOF/LDV or PrOD in CKD population is low (8.8%). There is a significant unmet need for HCV treatment in the CKD population.
- Male sex, non-1 genotype, and comorbidities are associated with a lower likelihood of treatment initiation with SOF/LDV or PrOD
- More advanced CKD is significantly associated with lower likelihood of treatment initiation with SOF/LDV or PrOD
- Overall SVR12 was 93.9%. Among those with CKD stage 3-5, SVR was 94.8% (N = 164/173)

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