Association Between Viral Clearance and Clinical and Sociodemographic Factors Within Adult Medicaid Members Treated for Hepatitis C

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Background

- Chronic Hepatitis C (CHC) affects approximately 2.7 million persons in the United States, with several newly-approved direct-acting antiviral (DAA) regimens offering new treatment alternatives.
- Numerous factors have been identified that are associated with a poor prognosis of hepatitis C virus (HCV) treatment, including co-infection with HIV and advanced liver disease.
- Drug-drug interactions among medications for the treatment of CHC and the medications commonly used in other comorbidities may decrease the efficacy of HCV treatment or contraindicate concomitant use during HCV treatment.
- Given the potential clinical benefits associated with new treatments and higher medication acquisition costs, continued analysis of the treated populations, the impact upon payer systems, and comprehensive assessments of overall cost-effectiveness are warranted.

Objective

To assess the association between the outcome of viral clearance and clinical and sociodemographic factors within adult Medicaid members being treated for Hepatitis C.

Methods

- Study Design and Database Characteristics : Cross-sectional historical cohort of comprehensive state-specific Medicaid administrative claims data (pharmacy and medical) from January 1, 2014 through March 31, 2015.
- Inclusion Criteria: Adult Oklahoma Medicaid enrollees (≥18 years) treated for HCV with a new DAA regimen with follow-up sustained virologic response (SVR) measurement 12 weeks after treatment completion.
- Outcome (Dependent) variable: Viral clearance
- Predictor (Independent) variables: patient demographics, comorbidities, and clinical profiles.
- Statistical Methods: A Bayesian multivariable logistic regression to assess the associations between clinical factors (comorbidities, history of cytochrome P450 system/CYP450, medication use, fibrosis score, liver disease) and socio-demographic attributes (age, sex, race) associated with viral clearance.

Results

Table 1. Descriptive Summary of Patient and Clinical Characteristics of Hepatitis C According to Treatment Outcome (Overall N=127)

	Successful Treatment N = 114 (90%)	Unsuccessful Treatment N = 13 (10%)
DEMOGRAPHICS		
Age in years: Median (IQR) [1]	54 (17)	55 (10)
Gender: n (%) [2]		
Male	55 (48%)	9 (69%)
Female	59 (52%)	4 (31%)
Race/Ethnicity: n (%) [2]		
White	94 (82%)	11 (85%)
Others	20 (18%)	2 (15%)
Charlson Comorbidity Index: n (%) [2]		
<6	84 (74%) **	4 (31%) **
≥6	30 (26%) **	9 (69%) **
Charlson Comorbidity Index: Median (IQR) [1]	3 (4)	6 (5)
Viral Load: Mean(SD) [3]	12.6 (±1.0)	12.5 (±0.7)
CYP450 Inducers present: n (%) [2]	2 (2%)	1 (8)
CYP450 Inhibitors present: n (%) [2]	62 (54%)	8 (61%)
CYP450 Categories: n (%)[2]		
Substrate Only	10 (9%)	3 (23%)
Other combinations of inducer, inhibitor and substrates	104 (91%)	10 (77%)
Liver Disease: n (%) [2]		
None	89 (78) **	5 (38) **
Moderate to Severe	25 (22) **	8 (62) **

Successful treatment defined as sustained virologic response at 12 weeks (undetectable HCV RNA at least 12 weeks after completion of therapy).
HCV: Hepatitis C virus; IQR: interquartile range; SD: standard deviation; CYP450: Cytochrome P-450
[1] Wilcoxon Independent sample test; [2] Chi square test/Fisher exact test; [3] t test (independent samples)
** p<0.01

Table 2. Bayesian Multivariable Logistic Regression of Crude and Adjusted Odds Summarizing the Association between Treatment Failure and Selected Covariates

Characteristic	Crude Odds Ratio (95% BCI)	Adjusted Odds Ratio (95% BCI)
Charlson Comorbidity Index (ordinal values)	1.20 (0.97, 1.49)	0.71 (0.33, 1.26)
Viral Load (continuous)	0.90 (0.51, 1.73)	0.69 (0.31, 1.75)
Age (continuous)	1.04 (0.98, 1.11)	0.99 (0.90, 1.11)
Race		
Whites	Referent	Referent
Others	0.74 (0.10, 3.26)	3.11 (0.26, 31.11)
Gender		
Female	Referent	Referent
Male	2.57 (0.75, 10.12)	2.14 (0.39, 13.58)
CYP450		
Other combinations	Referent	Referent
Substrate only	2.95 (0.55, 12.24)	15.53 (1.64, 176.20)
Liver Disease		
None	Referent	Referent
Moderate-Severe	1.56 (1.15, 2.17)	2.94 (1.39, 8.12)

BCI: Bayesian Credible Interval
Probability of an odds ratio of treatment failure for substrate use > 1: 97%
Probability of an odds ratio of treatment failure for patients with moderate-severe liver disease > 1: 99%

Conclusions

- This study of adult Medicaid members treated for HCV indicated that a history of CYP450 substrate use was associated with a 15.53-times higher odds of treatment failure after controlling for demographic, comorbid, and clinical profiles.
- The underlying mechanism through which CYP450 substrates may influence Hepatitis C treatment effectiveness in different patients requires additional research to better inform clinical practice guidelines.

Limitations

- Potential coding errors and omissions may have been present within these administrative claims data.
- Analyses based upon specific CYP450 substrates or inducers could not be conducted, predominantly due to low sample size.
- In addition to the lack of detailed clinical information, other unmeasured confounders may also exist.
- Caution should be undertaken in generalizing findings to other Medicaid programs or other Hepatitis C patients.

References

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