ORAL PRESCRIPTION OPIOID USE AS A HIGH-RISK INDICATOR FOR HCV INFECTION

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BACKGROUND

- Despite efforts made by several institutions, the opioid, and the subsequent hepatitis C virus (HCV), epidemic in the United States has only worsened over time.
- The medical community has attempted to curb this increase by limiting opioid prescriptions. Prescriptions were increasing between 2014-2015, but began to decrease in 2015 and continued to do so through 2017[1]. Decreasing oral opioid prescriptions is an important strategy considering the established trajectory from oral prescription opioids (OPOs) to nonmedical opioid use, opioid use disorder (OUD) and then injection drug use (IDU)[2,3].
- A major outcome of the opioid epidemic is increased HCV incidence rates, as IDU has long been considered the most significant risk factor for contracting this blood-borne virus[4,5]. Statewide data suggest a correlation between increased admissions for OUD and increased HCV infection rates between 2004 and 2014, as well as an increased incidence in the younger population[6]. Still, older patients, especially those belonging to the birth cohort (BC, born between 1945-1965), account for a majority of chronic HCV cases[4].
- Despite the established trajectories from OPOs to OUD, OUD to IDU, and IDU to HCV, we have found no studies demonstrating an association between OPOs and HCV infection.
- The aims of this study are to (1) evaluate OPOs for increased HCV prevalence and thus a potential HCV risk exposure and (2) observe trends related to OUD amongst patients taking OPOs. As new guidelines shift toward universal HCV screening, our substantiation of risk factors will allow providers to appropriately re-test and counsel patients regarding HCV and OUD.
- Our findings and recommendations will expand testing guidelines and contribute to global efforts toward the elimination of HCV.

METHODOLOGY

- MedStar Health (MSH) is the largest regional healthcare system in the mid-Atlantic US, with 10 hospitals, 300 outpatient practices and approximately 2 million persons visits annually. MSH serves a diverse patient population in urban, suburban and rural locations throughout DC, Northern Virginia, Southern Maryland, and north of Baltimore, Maryland.
- Data is reported from January 1, 2017 through December 31, 2018. A MSH database search identified over 115,000 persons in the system prescribed oral opioids. Data was extracted from the Cerner Medconnect EHR and a limited data set was reported in Excel.
- Variables included: date of birth, gender, race, prescribed oral opioid, prescription duration, HCV diagnosis date, anti-HCV and HCV RNA results, anti-HIV results, anti-HBV results, and substance use disorder diagnosis
- Data is reported in proportions and as univariate and multivariate logistic regression analyses. Continuous variables were described and compared by two sample t-test of means. Categorical variables were described and compared by chi-square tests. Multivariate logistic regression analyses were conducted to test predictors of HCVAb testing and positivity and OUD, adjusting for age, sex, race, chronicity, BC designation and OUD. Statistical significance was defined as $P<0.05$. Analysis was conducted using SAS v9.4 and EpiInfo™.

References:
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Table 1. Characteristics of patients prescribed OPOs across MedStar, January 1, 2017 — December 31, 2018

Characteristics	Prescribed Oral Opioid	Number of anti-HCV test performed (percent)	Number of anti-HCV reactive results (percent)	OR_{adj} (CI_{95})[a]
Total	115,415	11,464 (9.9)	1421 (12.4)	
Age in years, mean ± standard deviation	57.89 ± 16.7	55.6 ± 14.8	58.0 ± 11.6	*NS*
Sex				
Male	43,276 (37.5)	4,397 (10.2)	778 (17.7)	2.0 (1.7-2.2)
Female	72,113 (62.5)	7,066 (9.8)	643 (9.1)	
Race				
Black	42,840 (38.6)	6,031 (14.1)	838 (13.9)	1.5 (1.3-1.7)
White[b]	60,478 (54.5)	4,448 (7.4)	512 (11.5)	
Other[c]	7,609 (6.9)	811 (10.7)	58 (7.2)	0.84 (0.63-1.1)
HCV Diagnosis				
Prior Reporting as ICD9/10 Diagnosis[d]	2,059 (1.8)	564 (27.4)	489 (86.7)	
Newly Reported as ICD10 Diagnosis[e]	1,809 (1.6)	724 (2.5)	635 (87.7)	
HCV Screening (Excluding ICD10 Diagnosis)	111,547 (96.6)	10,176 (9.1)	297 (2.9)	
Newly Reported + HCV Screening	113,356 (98.2)	10,900 (9.6)	932 (8.6)	
Birth Cohort	55,616 (48)	6,467 (11.6)	1,041 (16.1)	2.4 (2.1-2.9)
Newly Reported HCV as ICD10 Diagnosis[e]	1,296 (1.1)	522 (40.2)	462 (88.5)	
Opioid Use Disorder[f]	3, 893 (3.4)	803 (20.6)	361 (45)	8.5 (7.2-10.1)
Newly Reported HCV as ICD10 Diagnosis[e]	417 (0.4)	176 (42.2)	164 (93.1)	

[a] OR calculated using multiple logistic regression (Wald $\chi 2$ test)
[b] Reference category for Black and Other analyses
[c] Other designation includes: Asian, Hawaiian/Pacific Islander, Indian/Alaskan Native, Other, Two or More Races
[d] Any reported diagnosis before the beginning of the study period, January 1st, 2017, based on an ICD9/10 code indicating HCV infection
[e] Any reported diagnosis during the study period, between January 1st, 2017 and December 31st, 2018, based on an HCV ICD9/10 code
[f] Any current reported diagnosis based on an OUD ICD9/10 code

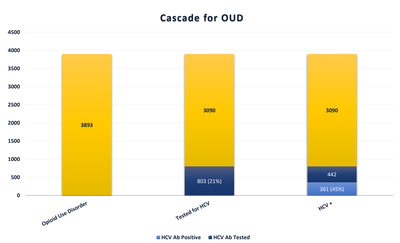


Figure 1. Cascade of OUD patients from OUD diagnosis to HCVAb+

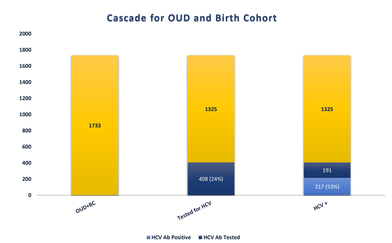


Figure 2. Cascade from OUD diagnosis and BC inclusion to HCVAb+

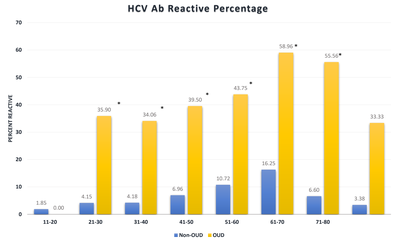


Figure 3. Percent of HCV Ab tests which were reactive in non-OUD and OUD patients in different age groups. * indicates p<0.0001

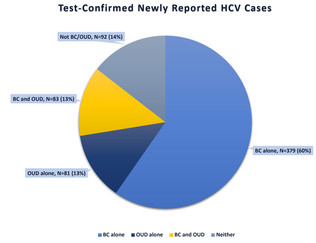


Figure 4. Percentage of HCV antibody positive results in newly reported cases of HCV (n=635) in the birth cohort (BC), patients diagnosed with opioid use disorder (OUD), both, or neither.

RESULTS

- Of the 9.9% (11,464) who received an HCVAb test, 12.4% (1,421) were HCVAb+; 9.4% (10,900) of testing was performed in those not previously diagnosed with HCV and 8.6% (932) were positive (Table 1).
- 3.4% (3,893/115,415) were diagnosed with OUD, 20.6% (803/3,893) were tested for HCV, of which 45.0% (361) were HCVAb+ (Table 1, Figure 1).
- Of those who tested HCVAb+, 25.4% (361/1,421) were diagnosed with OUD; of those who tested HCVAb+ for the first time in the record, 25.8% (164/635) were diagnosed with OUD (Figure 2).
- In the BC alone, black race (OR_{adj} 2.22, CI_{95} 1.90–2.59), male (2.45, 2.12-2.82) and OUD (6.97, 5.60-8.67), were independent predictors of HCVAb+; white race (1.68, 1.32-2.13) and OUD (9.65, 7.46-12.48) in the non-BC.
- In every age bracket with n>10, those with OUD had a significantly ($p<0.01$) higher Ab positivity rate (Figure 3).

CONCLUSIONS

- In a large population of patients prescribed oral opioids, HCV Ab reactivity rates (8.6%) were higher than the historical MSH reference (2.4%)
  - OPOs may be considered a marker for HCV and thus a potential RF for screening and counseling purposes
- Even though OUD is a known RF for HCV and was demonstrated to increase the chances of HCVAb positivity on multivariate analysis, only 20% of patients diagnosed with OUD were tested for HCV
  - Efforts should be increased to improve awareness among practitioners regarding HCV RFs
  - Limitation: prescription duration nor history of Ab testing was collected
- The trajectory from OPOs to OUD to IDU, along with literature indicating IDU as the main mode of HCV transmission, predicts that a majority of HCVAb+ patients in this population have OUD; however, only 25% of HCV positive cases, including and excluding old infections, were diagnosed with OUD.
  - New strategies might be considered for diagnosing and reporting OUD.
  - Limitation: Resolved diagnosis of OUD was not collected