



Association of Substance Use With Hospitalization and Virologic Suppression in a Southern Academic HIV Clinic



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ABSTRACT

Background: Persons with HIV infection who do not achieve virologic suppression contribute significantly to the ongoing HIV epidemic and have an increased risk of clinical sequelae related to immunosuppression. The extent to which substance use and mental health diagnoses affect HIV outcomes and the care continuum has not been previously assessed at the Medical University of South Carolina (MUSC), a large academic HIV clinic.

Methods: To address this knowledge gap and identify targets for intervention, we performed a retrospective chart review to examine associations of substance use and mental health diagnoses with hospitalization and virologic suppression.

Results: Patients with substance use or mental health diagnoses had increased rates of hospitalization and lower rates of sustained longitudinal HIV suppression. Prevalence of distinct substance-related disorders differed by race and sex. Although cocaine, alcohol and cannabis use were common, documented opiate use disorder was surprisingly infrequent given the ongoing opioid epidemic in South Carolina.

Conclusions: These data suggest effective assessment and treatment of substance use disorders will help improve the HIV care continuum in South Carolina.

Key Indexing Terms: HIV; Substance use disorder; Mental health disorder; Electronic medical record; HIV care continuum. [Am J Med Sci 2018;355(6):553–558.]

INTRODUCTION

In the United States, nearly half of all new HIV infections now occur in southern states.¹ In South Carolina (SC), there are ~750 newly reported HIV cases annually, and SC has the eighth and ninth highest national HIV prevalence and incidence rates, respectively.² New transmission events in SC occur primarily through heterosexual and male-to-male homosexual transmission,³ whereas reported intravenous drug use contributes less significantly (6–7%). The Charleston–North Charleston area is consistently in the top 20 US metropolitan areas for HIV prevalence, with a prevalence of 504.8 infections per 100,000 persons and an incidence of 29.2 infections per 100,000 persons in 2014.⁴ Nearly half of all South Carolinians with known HIV infection are not retained in care.^{5,6} As lack of retention in care is a known risk factor for new HIV transmission

events,⁷ efforts to understand factors that affect the HIV care continuum are urgently needed to help end the HIV epidemic.

The extent to which the HIV and substance use epidemics overlap in those living with HIV in SC is not firmly established. Between 2003 and 2012, alcohol-related hospitalizations remained stable, cocaine-related admissions decreased, whereas opiate-related admissions (heroin, methadone, oxycodone and other opiates) increased markedly in SC.⁸ Although the recorded drug poisoning death rate in SC is similar to national rates, the number of opioid-pain reliever prescriptions per capita in SC (rate of 101.8 per 100 persons, 11th ranked state) exceeds national averages (rate of 82.5/100 persons) (IMS National Prescription Audit, 2012). Previous work in people living with HIV has shown that having a substance-related disorder (SRD) is associated with lower

rates of retention and virologic suppression, as well as a higher prevalence of economic and social barriers and concomitant mental health disorders.⁹⁻¹¹ As an academic medical center that provides comprehensive care for the under-served, the Ryan White HIV clinic at the Medical University of South Carolina (MUSC) cares for over 1,200 people living with HIV infection, including approximately 100 new patients annually. Here, we performed a retrospective chart review to assess the prevalence of substance use and mental health diagnoses in outpatients with HIV infection at MUSC. Differences based on race and sex, and relationships to hospital admission and maintenance of virologic suppression, were examined, with an aim toward defining areas that would benefit from targeted intervention.

METHODS

We first used an electronic reporting tool within the Epic electronic medical record (SlicerDicer) to conduct a feasibility analysis based on clinical and demographic characteristics.¹² SlicerDicer allows for extraction of aggregate population level data in deidentified fashion based on user-defined search terms. Data in SlicerDicer for patients seen in the outpatient setting were available from 5/1/2012 through 5/31/2016. HIV status was determined using ICD9/10 codes for HIV disease (042/B20), whereas substance use was assessed using ICD9/10 codes including alcohol-related disorders (F10.*), cocaine-related disorders (F14.*), cannabis-related disorders (F12.*) and opiate-related disorders (F11.*).

We next performed a retrospective chart review of persons with HIV infection seen in the outpatient infectious diseases clinic at MUSC using information retrieved from the clinical data warehouse. Approval for this study was received from the MUSC Institutional Review Board (Pro00056049). The patient cohort was defined using ICD9/10 codes (042/B20) to identify persons with HIV infection and a location visit consistent with at least 1 completed outpatient visit in the infectious diseases clinic between 07/01/14 and 5/31/16, resulting in identification of 1,201 individuals. Laboratory and clinical data for this cohort were then retrieved from 06/01/06 through 05/31/16 and included HIV viral loads, urine toxicology screens and hospitalizations that occurred during this 10-year time frame. Data on race, sex and age were collected and are reported in aggregate. Diagnosis codes for each patient were reviewed for presence of documented alcohol, cocaine, cannabis or opiate use disorders, as well as presence of a mental health diagnosis. Polysubstance use was not examined, nor was prescription medication use analyzed for individual patients given the complexity of the data both within and outside of our health care system. Presence or absence of any hospitalization for any reason, i.e., for an HIV-related or unrelated indication, was determined and is reported as a dichotomous outcome irrespective of the total number of hospitalizations during the 10-year period of analysis.

A review of longitudinal HIV viral load values available for each patient revealed a broad distribution in the range of available data within the 10-year period of analysis. Because we did not examine prescription patterns, response to antiviral treatment was inferred based on virologic response. To simplify virologic suppression data for analysis, patients were grouped into 1 of 3 categories based on their viral load trend, irrespective of whether there were missing data during the 10-year period of analysis: (1) “complete virologic suppression” was defined as sustained virologic control based on data available during the 10-year period of analysis, without a viral load increase over 200 copies/mL once virologic suppression had been achieved after treatment initiation ($n = 720$); (2) “incomplete virologic suppression” was defined as evidence of at least 1 episode of loss of virologic control (viral load over 200 copies/mL) after virologic suppression had already been achieved with treatment ($n = 338$) and (C) individuals who could not be placed into one of these 2 categories based on insufficient data or lack of evidence that treatment had been initiated ($n = 143$). This third group includes patients in whom virologic suppression was never achieved, either due to lack of treatment initiation or due to lack of virologic suppression with treatment, a distinction we could not make based on the available data. For this reason, patients in this third group were excluded from subsequent analyses that examined virologic suppression; thus the cohort size was $n = 1,058$ for analysis of virologic suppression. Of note, for the “complete virologic suppression” group, successful treatment was defined based on the first instance when virologic suppression was achieved, irrespective of when this occurred, as initiation of treatment in all patients irrespective of CD4 count was not considered standard of care during the entire time; thus, lack of virologic suppression may have reflected treatment delay due to provider or patient preference rather than lack of virologic response. Finally, of the 1,201 patients defined in this cohort, 37 were reported as deceased at some point during the 2-year period in which the cohort was defined. Retrospective data for these patients was still considered and grouped as for the rest of the cohort based on available data.

Data were analyzed by unpaired t test, Pearson chi-squared test or logistic regression, as indicated in each figure, using the statistical software R version 3.4.

RESULTS

A preliminary analysis in SlicerDicer, a deidentified searchable database in the electronic medical record, suggested that alcohol, cocaine and cannabis use were more common diagnoses in people living with HIV cared for at MUSC than opiate use disorders (data not shown), in contrast to the aforementioned recent increase in opioid-related deaths and diagnoses in South Carolina as a whole.⁸ To better understand and analyze

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