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State of the ART: Characteristics of HIV infected patients receiving care in Mississippi (MS), USA from the Medical Monitoring Project, 2009–2010

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Abstract

Background—Mississippi, the poorest state in the US, has a very high prevalence of HIV and among the highest HIV infection rates and AIDS-adjusted mortality rates in the country. African Americans, who suffer the worst health care disparities in the US, account for 76% of people with HIV in MS. The purpose of this study is to describe those in care for HIV and determine the factors associated with anti-retroviral treatment (ART) and viral suppression.

Methods—The CDC’s Medical Monitoring Project collects surveillance data from 23 project areas in the US, including Mississippi, using annual probability sampling of persons in care for HIV. Data were collected from in-person interviews and medical record abstraction in 2009. The surveillance period was the 12 months prior to the interview date.

Results—212 randomly selected participants represented a nationally representative weighted sample of 3190.4. Participants had a mean of 3.71 provider visits during the surveillance period. Geometric mean for CD4 count = 438.91 (95% CI 402.25–475.56). Overall 80.80% (95% CI 75.30%-86.29%) were on ART, and 68.12% (95% CI 62.69%-73-56%) had undetectable viral load. Males (65.15%) were less likely to achieve undetectable viral load compared to females (78.30%) after controlling for individuals who were on ART ($p=0.01$). Viral suppression was not associated with age, race or sexual risk factors.

Conclusions—Although Mississippi has a high proportion of individuals out of HIV care, the majority in care is on ART and has suppressed viral loads. However, men are less likely to achieve virological suppression than females.

Introduction

The American South had the highest rate of new HIV diagnoses in 2013 at 20.5 per 100,000 accounting for 51% of the new infections as compared to 15.9 in the Northeast, 10.8 in the West and 9.0 in the Midwest. The South accounted for 40% of all people living with HIV and for nearly 50% of all deaths in people with AIDS in the US in 2012. The survival with HIV and AIDS was also the lowest in the South in 2013. African Americans represented nearly 44% of new HIV infections and 41% of all people living with HIV in 2012 and have poorer outcomes at every point of the HIV care continuum.

In 2012, Mississippi had the tenth highest rate of new HIV diagnoses. The capital city of Jackson had the 8th highest rate of new HIV diagnoses of any metropolitan area in the country. Mississippi had the highest adjusted case fatality rates among 37 US states studied between 2001 and 2007. Similar to racial/ethnic disparities observed on a national-level, African Americans accounted for 76% of all HIV infections in the state, though only composing 37% of the population in Mississippi in 2013. While this may suggest contextual issues such as disparities in quality of HIV care affecting survival and mortality, these factors are poorly understood in African Americans in the Deep South.

In Mississippi, out of an estimated 8,861 People Living with HIV/AIDS (PLWHA) in 2012, 45.6% had been diagnosed with AIDS. Viral load suppression is considered the goal of being in care for HIV, not only because of its impact on the patient's health but because of its implications in reducing HIV transmission to others. Therefore, our goal with this study is to evaluate the characteristics of those receiving care for HIV in Mississippi and the factors associated with viral load suppression.

Methods

The Medical Monitoring Project (MMP) is an ongoing, multi-cross sectional surveillance project of people who are receiving care for HIV in 23 US cities, which represents a population base of 80% of known HIV cases in the US. The objectives of the MMP are to identify the factors associated with the progression of HIV and learn more about the experiences and needs of PLWHA.

The MMP nationally has a three stage sampling design which first samples areas with different prevalence rates. The next two sampling stages are relevant to individual project areas like Mississippi as it includes sampling from large, medium and small practices or facilities providing HIV care in the entire state. The third stage includes sampling of the patients in care at these facilities, and 400 individuals are sampled each year in Mississippi from people who attended one clinic visit during the project defined period i.e. January 1 to April 30. Inclusion criteria are that they have to be at least eighteen years of age, HIV positive and seen for HIV related care at that facility.

Data for this study were taken from the 2009 cycle of MMP where 11 facilities agreed to participate. Four hundred PLWHA receiving HIV care in Mississippi were selected to participate in MMP. Of these, 214 were contacted and agreed to participate. Individuals underwent an interviewer-administered questionnaire, and their medical records were abstracted, including information on AIDS diagnosis, medication use and viral load status. The interviews were conducted by trained personnel. Data were collected from HIV provider outpatient visits and any reports of inpatient hospital stays through the entire surveillance period for participants interviewed during the 2009 cycle when available. The surveillance period was defined as the 12 months prior to the date that the participant completed the interview. Our final analysis cohort was 212 PLWHA, which after applying weighting methods previously described (CDC. Behavioral and Clinical Characteristics of Persons Receiving Medical Care for HIV Infection – Medical Monitoring Project, United States, 2010. HIV Surveillance Special Report. <http://www.cdc.gov/hiv/pdf/>

[MMP_2010_surveillancesummary.pdf](#)) constituted a representative sample size of the 3190.4 (3191) PLWHA in care.

Outcomes

Antiretroviral Therapy (ART) use and viral load suppression through most recent viral load data were ascertained during the medical record abstraction and from interviews.

Statistical analysis

Demographic and sexual behavior characteristics are presented using descriptive means (95% confidence interval) and percentages. Clinical outcome data such as CD4 cell count and viral load are presented using a stratified mean (standard deviation) and count (proportion). We used Rao-Scott Chi-square test statistics for categorical variables and t-tests for continuous variables.

Multivariable models were used to estimate associations between ART and viral suppression (outcomes) and individual-level covariates. We estimated odds ratios (ORs) and 95% confidence intervals (CIs) from multivariable regression models using the PROC LOGISTIC procedure in SAS.

Results

Demographic characteristics of PLWHA in care in Mississippi: African Americans made up 82.2% of the sample, consistent with the HIV epidemiological profile in MS. Males made up 62.3 % of the sample, females made up 37.7% of the sample. Individuals identified as transgender constituted the remaining 1.4%. The mean age of the sample was 43 years. 54.1% were under the age of 44 years, but 34% of the sample was between 45 and 54 years.

Our adjusted response rate for interviews was 60.6%. Those receiving care in large facilities and over the age of 35 were more likely to participate. Gender, years since diagnosis, race and ethnicity were no different between those who participated and those who did not. Those who were not interviewed were not interviewed largely because we were not able to contact them (29%). Only 13.7 % of those contacted refused to participate in the interview.

Socioeconomic

72.5% of the sample had at least a high school diploma. 43.5% had Medicaid in the past year and 29.4% had Medicare. 31.8% had Ryan White or no coverage. These values are not mutually exclusive as participants could report having more than one type of coverage in the past year.

Health literacy

When compared to those who did not know their most recent CD4 value (22%), participants who claimed to know their most recent CD4 count (78%) had significantly more years of education, greater confidence in their health literacy and significantly more recent CD4 test done (3.7 months vs 7.3 months). There was no significant difference between age, gender, race, actual CD4 count value, years since diagnosis of HIV, lower income or ART status.

Similarly, those who knew their most recent viral load value had significantly more years of education, greater confidence in their health literacy (described as reporting confidence in filling out medical forms or reading hospital materials), a more recent viral load test, and a lower viral load (2.9 log copies/ml vs 3.9 log copies/ml).

Clinical characteristics

The average CD4 count of the participants was 438.9. 65.2% of the sample either had a prior diagnosis of AIDS or a nadir CD4 count of <200. 17.6% had a diagnosis of depression from their medical record abstraction (MRA). While 21.5% reported using alcohol in the past 12 months, only 24.5% (n=28 out of 114 respondents) reported having greater than 4 drinks on each occasion. The MRA data on alcohol use was present for only 26 participants and 19.2% (n=5) of them had documentation of alcohol abuse.

Access to care

Only 4 (1.8%) of the 214 participants reported not seeking care within 3 months of being diagnosed with HIV. Eight (3.7%) participants had not had a clinical care visit in the past 6 months. The average time it took to get to their usual HIV care facility was 37 minutes. ART prescription and adherence: A majority of the participants interviewed (83.6%) acknowledged being on ART currently. Seven percent said they had been on ART in the past but were not taking it currently and 9.4% denied ever taking ARTs. Compared to MRA data, 80.8% (N= 173) had documentation of being on an ART at present. 18.2 % (n= 37) had been listed as not being on ART and 0.93% (n=2) had no data. Per MRA data, there were no statistically significant differences between those on ART and those not on ART with respect to age, gender, race, sexual risk categories, average CD4 count or CD4 count categories.

39.9% reported never missing their medications while 21.4 % reported missing their medications in the past week. 26.5 % had missed their medications between 2 weeks to 3 months prior to the interview. 12.3 % had missed their medications greater than 3 months previously. Of those who missed their medications, 25.7% claimed they had a problem with their prescription or refill. 21% said that they simply forgot to take them. 19.5% reported missing medications due to a change in routine such as travel. 10.6 % missed their medications because they were too sick to take them.

Viral load suppression

Viral load data was not available for every participant. Of those who were listed as being on ART (n=173), viral load data was present in 97.2% (n=169). But, of those who were listed as not being on ART (n=37), viral load data was present in only 80.6% (n=30). 55.1% of the total sample had a recent viral load that was undetectable.

Effect of ART

For those on ART: Males (65.15%) were less likely to achieve undetectable viral load compared to females (78.30%) (p=0.01). After controlling for ART prescription in the logistic regression model, men had lower odds of virological suppression [OR 0.57, p = 0.02]. Race and age were not significantly associated with viral load suppression when controlling for ART prescription; however, having a higher CD4 count of greater than 350

cells/cm³ was associated with a greater odds of virological suppression (OR 4.72 to 4.87, $p < 0.001$). Those on ART had a lower average CD4 count. (472.1 Vs 432.5) compared to those who were not on ART which may be a reflection of the previous guidelines for initiation of ART only in those with CD4 counts less than 350 in 2009.

Discussion

This study is the first of its kind on evaluating factors affecting virological suppression on a statewide level in Mississippi. Several interesting and unexpected trends have emerged from this data.

Firstly, it appears that those in care are older (mean age 43 years) and more likely to identify as heterosexual (70%) in contrast to those who are being diagnosed with HIV in our state for the past several years who are younger and in a large proportion MSM. Per the 2013 MS State HIV epidemiological profile, 54.3 % of the newly diagnosed cases reported being MSM as a risk factor, 18.3% reported heterosexual transmission and 24.8 % did not report their transmission risk. This may also represent the deep effect of stigma in Southern culture, where MSM are less likely to participate in the surveillance project. It is possible that stigma to HIV and homophobia may be a factor keeping gender and sexual minorities from accessing and being retained in HIV care. One observation that may support this theory is that while 75% of all HIV infected people in MS are male, in our analysis only 61.7% were male.

The data also reveals the high proportion of our population that is dependent on public benefits through Medicare (29.4%) or Medicaid (43.5%)- higher than what it is reported for the general population in the state of Mississippi (22% on Medicaid and 13% on Medicare), which in turn is still higher than the national average (16% Medicaid and 12% Medicare). This points to the significant socioeconomic challenges faced by our HIV infected population in terms of navigating through public services with limited resources. With respect to socioeconomic status in our study, health literacy proved more complex to evaluate as it was not a lower income that affected a person's knowledge of his/her state of health with respect to HIV but their level of education and the timing of their care visits.

In terms of access to care, over 90% of those sampled reported establishing care within 3 months of diagnosis. Their average travel time to their HIV care facility was less than an hour (37 minutes). Our sample, while economically disadvantaged, reveals itself to be one that has had few barriers to linkage, access and adherence to care visits. Again, this may be due to the bias of sampling those recently in care that were successfully contacted to participate in the interview which may select for a highly motivated group of individuals.

There were no disparities noted between those who receive ART and those who did not, with respect to gender, race, age, sexual risk factors or CD4 status. Significant health disparities among racial groups in terms of quality of care does not seem to be reflected in the in-care group. Compared to the national averages, those in care in MS have slightly lower rates of being on ART (80 vs 88%) and being virologically suppressed (55% vs 68%). The ultimate marker of adherence to medications, i.e. virological suppression, was reflective of a gender

disparity with men less likely to achieve virological suppression (65%) than women (78%). This is contrary to national data where on an average 79% of men and only 71% on women on ART had a recent suppressed viral load. This may be multifactorial and bears further investigation. Men may have different occupational, economic, and cultural pressures in the South driving this outcome. A self-reported marker of adherence revealed that about 40% of our sample had never missed their medications but those who missed, mostly did so in the past week before their visit (21%) with the most common reason for missing their medication was a system based issue-such as a problem with their refill or prescription.

This descriptive analysis of our MMP data has allowed us to identify core issues affecting the population in care that warrant further evaluation through a targeted study designed to explore them. The implications of these findings are several. First, it highlights the need for public policy to be attuned to the needs of PLWHA in Mississippi who are dependent on public benefits. Secondly, it highlights that men in this region, in general, have greater challenges to virological suppression. It also reveals a smaller proportion of MSM in care than those living with HIV. These need to be explored to better target care strategies to our population living with HIV.

There were several system level and individual data level limitations in our study. Our sample size was small. Surveillance data is not designed to capture confounding associations and interactions between various variables. Participants could choose not to answer several questions leading to multiple missing variables. In addition, the medical record abstraction is limited by the quality of documentation of health care providers. Of note though, 6% of our sample (n=13) had unknown or missing viral load status and ART status, thus limiting our analysis.

In general, the quality of care received by the participants may not reflect the universe of people who are in care as the study design is biased towards people who are not just in care but recently in care. Nonetheless, the proportion of patients on ART and the proportion that are virologically suppressed in our sample are similar to the proportion of people in ARV and achieving viral suppression in the national cascade of care.

Conclusions

Those in HIV care in Mississippi have lower than the national average rates for being on ART and being virologically suppressed. Men in Mississippi are less likely to achieve viral load suppression than women, contrary to national trends where women have decreased virological suppression. Those in care are also greatly dependent on public benefits for their care. Knowledge of their health status was affected by level of education and timing of care visits.

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Joseph Grice, MPH: Project Manager MS MMP 2010–2013.

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