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Clinical Outcomes of Young Black Men Receiving HIV Medical Care in the United States, 2009–2014

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Abstract

Background: More than one-quarter of 2016 HIV diagnoses among blacks in the United States occurred among persons aged 15–24 years, and three-quarters were among men. Although the prevalence of viral suppression in all tests in the past 12 months (durable viral suppression) among persons receiving HIV care increased from 58% to 68% during 2009–2013, we do not know whether this same improvement was observed among young black men receiving care.

Methods: We analyzed the 2009–2014 Medical Monitoring Project data collected from 336 black men aged 18–24 years. We estimated the proportion of young black men receiving HIV care who were prescribed antiretroviral therapy (ART), adherent to ART, and durably virally suppressed. We assessed changes in clinical outcomes over time and their association with patient characteristics, health behaviors, and depression.

Results: During 2009–2014, 80% of young black men receiving HIV care were prescribed ART, 73% were adherent to ART, and 36% had durable viral suppression. There was no significant change in viral suppression over this period. ART prescription and durable viral suppression were significantly higher among those receiving the Ryan White HIV/AIDS Program assistance compared with those who did not. Durable viral suppression was significantly lower among those who used drugs compared with those who did not.

Conclusions: Viral suppression among young black men during 2009–2014 was lower than that among the overall population receiving HIV care in 2013 (36% vs. 68%). Increasing viral suppression is essential to improve health and reduce HIV transmissions in this key population.

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Keywords

Young black men; MMP; HIV care

INTRODUCTION

Young black or African American (hereafter referred to as black) persons continue to have substantial risk of HIV acquisition in the United States. Of 17,528 HIV diagnoses among blacks in 2016, 26% were among young persons aged 15–24 years and 74% were among men.[1] Persons living with HIV who take antiretroviral therapy (ART) can achieve viral suppression and have effectively no risk of transmitting HIV.[2] Substantial increases in ART prescription and viral suppression were documented among persons receiving HIV care during 2009–2013, including for young people and blacks overall,[3,4] and reductions in black–white disparities in HIV clinical outcomes were also documented during this time period.[3] However, young black persons have the lowest levels of viral suppression among HIV-diagnosed persons in care,[5] which, particularly among young black men who have sex with men (MSM), may be fueled by poverty, access to care, and social challenges such as stigma, discrimination, and homophobia.[6] To assess whether clinical outcomes improved specifically among young black men receiving HIV medical care, we used data from the Medical Monitoring Project (MMP) to estimate trends in ART prescription, adherence, and viral suppression during 2009–2014 and examined associations of these outcomes with patient characteristics, health behaviors, and depression.

METHODS

Study Design and Population

MMP is an HIV surveillance system that was designed to produce annual, cross-sectional estimates of behavioral and clinical characteristics of adults 18 years or older receiving clinical care for HIV in the United States and Puerto Rico. We analyzed pooled data from MMP's 2009–2014 cycles (collected June 2009–May 2015). During these years, the MMP used a 3-stage, probability-proportional-to-size sampling method in which states and one territory were sampled first, then facilities providing outpatient HIV care in those areas, and finally eligible patients receiving care in those facilities. Trained interviewers administrated standardized face-to-face or telephone interviews, and medical records were abstracted. Data were weighted on the basis of known probabilities of selection[7] at state or territory, facility, and patient levels, and later adjusted for nonresponse following established methods.[8] During 2009–2014, the facility response rate ranged from 76% to 86% and the patient response rate ranged from 50% to 56%. MMP data collection is a part of routine public health surveillance, and thus, determined to be nonresearch.[9] Participating states or territories and facilities obtained local institutional review board approval to collect data, when required. Informed consent was obtained from all interviewed participants.

Measures

Participant Characteristics—Demographic and behavioral characteristics were self-reported during the interview. Young black men were defined as men aged 18–24 years with

non-Hispanic black or African American race/ethnicity (N = 336). Demographic factors included education level, homelessness at any time in the past 12 months, and household income at or below federal poverty guidelines. MSM sexual behavior was defined by male sex at birth and male gender, and self-reported sex with a man during the past 12 months. Any Ryan White HIV/AIDS Program (RWHAP) assistance was defined as having the RWHAP coverage for medical care or antiretroviral medicines in the past 12 months. Health behaviors included current cigarette smoking, binge drinking in the past 30 days, and any injection or noninjection drug use in the past 12 months. Depression was assessed with the Patient Health Questionnaire 8, and a score of ≥10 defined current depression.[10]

Clinical Outcomes: ART Prescription, ART Adherence, and Viral Suppression—ART prescription and viral suppression were abstracted from medical records. Durable viral suppression was defined as all viral load measurements documented undetectable (<200 copies/mL) in the past 12 months. Persons with no viral load measurement in the previous 12 months were considered to be not durably virally suppressed. ART adherence was self-reported and defined as taking all of one's prescribed antiretroviral medicines during the past 3 days.

Statistical Analyses

All analyses were conducted using survey procedures in SAS (version 9.3; SAS Institute, Inc., Cary, NC) to account for the complex survey design. To assess changes in clinical outcomes over time, we created 3 time periods by combining 2 years of data for each: 2009–2010, 2011–2012, and 2013–2014. Because the sample size was small in each cycle year, we needed to combine data in this way to increase the sample size for trend analyses. We estimated weighted proportions with 95% confidence intervals (CIs) of demographic, behavioral, and clinical factors among young black men receiving HIV care and assessed changes in all characteristics over the time period 2009–2014. We used linear regression to estimate beta-coefficients for the association between time period and these characteristics, and to estimate P values for trend. Coefficients represent the average percentage point change in a population characteristic from one time period to the next; we considered trends to be statistically significant at the $P \leq 0.05$ level. We used Rao–Scott χ^2 tests to assess the association of clinical outcomes with demographic, health behaviors, and depression using pooled 2009–2014 data.

RESULTS

Among young black men receiving HIV care during 2009–2014, 72.3% reported MSM sexual behavior, 14.7% had less than high school education, 54.2% lived at or below federal poverty guidelines, and 11.9% were homeless at any time in the past 12 months (Table 1). These characteristics did not change from 2009 to 2014. More than half (52.7%) received the RWHAP assistance to pay for medical care or ART medications. Overall, 36.3% were current cigarette smokers, 44.5% used injection or noninjection drugs, and 20.4% had current depression. During 2009–2014, 80.1% of young black men were prescribed ART, 72.6% were adherent to ART, and 35.7% had durable viral suppression. ART prescription

increased from 60.5% in 2009–2010 to 88.2% in 2013–2014 (β = 0.13, *P* for trend <0.05), but there was no significant change in ART adherence or viral suppression over time.

Bivariate analyses indicated that there were no significant associations between clinical outcomes and MSM sexual behavior, education level, household income, homelessness, cigarette smoking, and binge drinking (Table 2). However, ART prescription was higher among young black men who had any RWHAP assistance compared with those who did not (93.2% vs. 66.8%, $P < 0.05$). ART adherence was lower among those who had current depression compared with others (53.1% vs. 77.6%, $P < 0.05$). Durable HIV viral suppression was higher among young black men who received the RWHAP assistance compared with those who did not (46.0% vs. 25.4%, $P < 0.05$), but was lower among those who used injection or noninjection drugs compared with those who did not (28.0% vs. 42.0%, $P < 0.05$).

DISCUSSION

Among young black men who received HIV medical care in the United States, ART prescription increased by 46% from 2009 to 2014, but there were no accompanying significant increases in ART adherence or viral suppression. Moreover, viral suppression was lower among young black men during 2009–2014 (34.2%) than among all adults (68%) and young adults aged 18–29 years (51%) who were in HIV clinical care during 2013. The increase in ART prescription may be attributable to changes in ART prescription guidelines recommending early initiation of ART.[11] Although simpler and more tolerable ART regimens also became available for the treatment of HIV infection during the years included in this study,[12] these developments may not have yielded increased medication adherence for this population. Low prevalence of ART adherence and viral suppression was observed overall and lowest among young black men who were depressed or used drugs.

Poor HIV clinical outcomes are related not only to individual behaviors but also to the social, contextual, and environmental factors in which these behaviors occur.[13] Our study indicates that a high proportion of young black men were living at or below the poverty level, nearly 12% were homeless, and sociodemographic factors did not change during the study period. Interventions to increase viral suppression that take social determinants of health into account and address particular challenges that young black men may experience are needed.

The RWHAP, which our findings indicate serves many young black men receiving HIV care, provides mental health and substance abuse services, case management, and assistance with food, housing, and transportation.[14] These ancillary services have been shown to improve clinical outcomes when offered alongside medical care, particularly for populations with high levels of unmet need for supportive services.[15,16] The observed associations between ART adherence and depression, and between viral suppression and drug use indicate a need for increased awareness of and access to these services in this population. Collaboration among federal agencies providing HIV care and supportive services will be necessary to address the myriad socioeconomic challenges that young black men face, which impede their progress along the HIV care continuum.[17]

In addition to addressing social determinants of health, interventions that aim to directly increase medication adherence in this population may be needed. Previous studies indicate low self-efficacy and lack of perceived treatment utility are associated with low ART adherence among young people.[18] Evidence-based guidelines recommend 2 specific tools to improve medication adherence: education and counseling using specific adherence-related tools (eg, pill organizer, dose planner, reminder alarm device, and electronic drug monitors) and use of communication technologies with an interactive component (eg, texting dosage information, texting weekly check-ins from clinic with telephone follow-up, and texting with expected reply).[19] Mistrust of the medical establishment is also a commonly cited barrier to accessing HIV care and treatment services among blacks.[20,21] Training providers on techniques for promoting trust in patient–provider relationships, addressing structural discrimination and racism in clinical settings, and delivering treatment and implementing CDC-recommended high-impact HIV prevention methods for young black men may help to increase ART adherence and viral suppression.

Our analysis has some limitations. First, our study population included only persons receiving medical care, thus do not represent the entire population of HIV-positive young black men. Second, self-reported information, including medication adherence, is subject to recall and social desirability biases. Finally, the sample size of our study is small in each cycle. We combined years to improve the sample size for trend analyses. In some instances, small sample size resulted in either high coefficients of variance or wide CIs; these estimates were suppressed or noted in the tables, and conclusions based on these estimates should be interpreted with caution. Small sample size also limited our ability to examine potential moderators of ART use and viral suppression in this population, but as MMP data collection continues and more data are obtained, future studies may be able to explore modifiable factors that could improve clinical outcomes. Despite these challenges, this analysis provides much needed population-based data on a key population.

In conclusion, although ART prescription increased, we found no change in ART adherence or viral suppression during 2009–2014 among young black men receiving HIV care. Viral suppression is still lower among young black men than adults receiving HIV care. To improve the health of young black men living with HIV and reduce onward transmission of HIV, multifaceted interventions to increase ART adherence, increased awareness of and access to the RWHAP, and enhanced efforts to address the social determinants of health that influence poor HIV clinical outcomes in this population are needed.

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TABLE 1.

Patient Characteristics of HIV-Infected Young Non-Hispanic Black or African American Men in Care, MMP 2009–2014

	Total			2009–2010			2011–2012			2013–2014			2009–2014	
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	β-Trend	*P*
Patient characteristics														
MSM sexual behavior‡														
Yes	237	72.3	66.4 to 78.2	59	74.0	61.4 to 86.5	81	68.1	57.6 to 78.6	97	75.3	67.0 to 83.6	0.011	0.751
No	91	27.7	21.8 to 33.6	23	26.0	13.5 to 38.6	38	31.9	21.4 to 42.4	30	24.7	16.4 to 33.0		
Education level														
Less than high school	46	14.7	9.7 to 19.6	__*	—	—	21	19.9	10.5 to 29.3	13	9.3	4.2 to 14.3	—	—
High school grad or more	290	85.3	80.4 to 90.3	—	—	—	101	80.1	70.7 to 89.5	119	90.7	85.7 to 95.8		
Household income at or below poverty guideline§														
Yes	160	54.2	47.7 to 60.7	35	46.5	31.8 to 61.2	68	62.8	53.0 to 72.7	57	50.4	40.3 to 60.6	0.008	0.847
No	138	45.8	39.3 to 52.3	41	53.5	38.8 to 68.2	39	37.2	27.3 to 47.0	58	49.6	39.4 to 59.7		
Any RWHAP assistance														
Yes	170	52.7	46.7 to 58.6	33	42.0	27.6 to 56.5	67	58.1	48.7 to 67.5	70	53.8	45.1 to 62.5	0.049	0.221
No	162	47.3	41.4 to 53.3	47	58.0	43.5 to 72.4	55	41.9	32.5 to 51.3	60	46.2	37.5 to 54.9		
Homelessness‖														
Yes	35	11.9	7.5 to 16.4	—	—	—	—	—	—	17	14.0	8.3 to 19.8	—	—
No	301	88.1	83.6 to 92.5	—	—	—	—	—	—	115	86.0	80.2 to 91.7		
Health behaviors and depression														
Current cigarette smoking														
Yes	117	36.3	29.1 to 43.4	26	30.3	20.6 to 40.0	49	43.5	33.0 to 54.0	42	33.2	20.7 to 45.7	0.004	0.928
No	217	63.7	56.6 to 70.9	56	69.7	60.0 to 79.4	71	56.5	46.0 to 67.0	90	66.8	54.3 to 79.3		
Binge drinking¶														
Yes	80	23.3	18.1 to 28.4	21	22.7	13.3 to 32.1	27	22.7	16.4 to 28.9	32	24.2	13.8 to 34.6	0.008	0.828
No	250	76.7	71.6 to 81.9	59	77.3	67.9 to 86.7	92	77.3	71.1 to 83.6	99	75.8	65.4 to 86.2		
Injection or noninjection drug use														
Yes	145	44.5	38.6 to 50.4	34	42.5	31.7 to 53.3	60	51.6	42.2 to 61.1	51	39.0	30.3 to 47.7	−0.027	0.457
No	189	55.5	49.6 to 61.4	48	57.5	46.7 to 68.3	60	48.4	38.9 to 57.8	81	61.0	52.3 to 69.7		

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	Total			2009–2010			2011–2012			2013–2014			2009–2014	
	N	%	95% CI	N	%	95% CI	N	%	95% CI	N	%	95% CI	β-Trend	*P*
Current depression (PHQ-8 score >10)														
Yes	66	20.4	15.6 to 25.1	—	—	—	28	24.0	16.0 to 32.0	22	19.1	13.7 to 24.5	—	—
No	265	79.6	74.9 to 84.4	—	—	—	91	76.0	68.0 to 84.0	108	80.9	75.5 to 86.3		
Clinical outcomes														
ART prescription	275	80.1	74.9 to 85.3	53	60.5†	44.3 to 76.6	104	84.3	78.8 to 89.8	118	88.2	80.7 to 95.8	0.129	0.002
Self-reported 100% ART adherence in the past 3 d	189	72.6	67.2 to 77.9	36	66.0†	48.0 to 83.9	72	76.6	68.8 to 84.4	81	72.0	65.1 to 78.8	0.018	0.669
All viral load measurements undetectable or <200 copies/mL in the past 12 mo	119	35.7	29.2 to 42.2	24	25.0	15.2 to 34.9	53	44.2	34.7 to 53.6	42	34.2	21.2 to 47.2	0.033	0.448

*Values suppressed for estimates with a coefficient of variation ≥0.30.

†Absolute CI width >30, estimates should be interpreted with caution.

‡MSM sexual behavior was defined by male sex at birth and male gender, and self-reported sex with a man during the past 12 months.

§Poverty guidelines as defined by the Department of Health and Human Services (HHS); the 2013 guidelines were used for patients interviewed in 2014, and the 2014 guidelines were used for patients interviewed in 2015. More information regarding the HHS poverty guidelines can be found at http://aspe.hhs.gov/frequently-asked-questions-related-poverty-guidelines-and-poverty.

‖Living on the street, in a shelter, in a single-room occupancy hotel, or in a car.

¶Binge drinking defined as 5 or more alcohol drinks in one sitting for men, 4 or more alcohol drinks in one sitting for women.

PHQ-8, Patient Health Questionnaire 8.

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TABLE 2.

Patient Characteristics, Health Behaviors, and Depression of HIV-Infected Young Non-Hispanic Black or African American Men in Care, by Clinical Outcomes, MMP 2009–2014

	ART Prescription			Self-Reported 100% ART Adherence in the Past 3 Days			All Viral Load Measurements Undetectable or <200 Copies/mL in the Past 12 Months		
	N	%	95% CI	N	%	95% CI	N	%	95% CI
Patient characteristics									
MSM sexual behavior[§]									
Yes	196	81.4	75.1 to 87.7	137	73.8	66.8 to 80.7	77	33.7	26.3 to 41.1
No	72	76.8	69.2 to 84.5	48	69.9	59.9 to 79.8	39	41.2	30.1 to 52.4
Education level									
Less than high school	35	76.7	62.8 to 90.6	21	66.6[‡]	50.3 to 82.9	18	38.3	26.1 to 50.6
High school grad or more	240	80.7	75.4 to 86.0	168	73.6	68.1 to 79.1	101	35.3	28.1 to 42.5
Household income at or below poverty guideline[‖]									
Yes	129	79.2	72.6 to 85.8	85	73.8	66.3 to 81.3	56	34.5	24.4 to 44.7
No	111	78.2	69.9 to 86.5	78	68.9	59.5 to 78.3	45	34.8	25.7 to 44.0
Any RWHAP assistance									
Yes	159	93.2[*]	88.8 to 97.7	121	75.4	68.8 to 82.0	75	46.0[*]	37.7 to 54.4
No	114	66.8	57.9 to 75.7	67	67.7	56.6 to 78.9	44	25.4	17.5 to 33.3
Homelessness[¶]									
Yes	28	74.4	58.2 to 90.7	16	55.9[‡]	39.1 to 72.7	__[†]	—	—
No	247	80.9	75.7 to 86.0	173	74.8	69.6 to 80.0	110	37.5	31.2 to 43.9
Health behaviors and depression									
Current cigarette smoking									
Yes	97	81.9	73.6 to 90.1	62	67.8	59.3 to 76.2	39	33.3	25.5 to 41.0
No	177	79.6	73.5 to 85.7	127	75.4	68.3 to 82.5	79	37.2	27.3 to 47.1
Binge drinking[#]									
Yes	67	84.4	77.0 to 91.8	48	73.4	62.3 to 84.6	23	30.6	20.6 to 40.7
No	203	78.9	72.8 to 85.10	139	72.5	65.6 to 79.3	93	37.2	29.6 to 44.9

	ART Prescription			Self-Reported 100% ART Adherence in the Past 3 Days			All Viral Load Measurements Undetectable or <200 Copies/mL in the Past 12 Months		
	N	%	95% CI	N	%	95% CI	N	%	95% CI
Injection or noninjection drug use									
Yes	116	77.8	69.8 to 85.8	76	68.4	58.4 to 78.3	41	28.0 *	21.3 to 34.8
No	158	82.6	76.2 to 88.9	113	75.8	69.1 to 82.6	77	42.0	33.6 to 50.3
Current depression (PHQ-8 score >10)									
Yes	55	86.8	78.8 to 94.8	28	53.1 *	39.2 to 67.0	22	35.4	23.3 to 47.4
No	216	78.4	72.5 to 84.4	159	77.6	72.5 to 82.6	94	35.2	28.4 to 42.1

*Estimates significantly different ($P < 0.05$) using the Rao–Scott χ^2 test.

†Values suppressed for estimates with a coefficient of variation ≥0.30.

‡Absolute CI width >30, estimates should be interpreted with caution.

§MSM sexual behavior was defined by male sex at birth and male gender, and self-reported sex with a man during the past 12 months.

‖Poverty guidelines as defined by the Department of Health and Human Services (HHS); the 2013 guidelines were used for patients interviewed in 2014, and the 2014 guidelines were used for patients interviewed in 2015. More information regarding the HHS poverty guidelines can be found at http://aspe.hhs.gov/frequently-asked-questions-related-poverty-guidelines-and-poverty.

¶Living on the street, in a shelter, in a single-room occupancy hotel, or in a car.

#Binge drinking defined as 5 or more alcohol drinks in one sitting for men, 4 or more alcohol drinks in one sitting for women.

PHQ-8, Patient Health Questionnaire 8.