

Depressive symptoms and substance use: Changes overtime among a cohort of HIV-positive and HIV-negative MSM

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Background

- This study aimed to examine the prevalence, correlates, and changes in depressive symptoms over time, among a cohort of HIV-positive and high risk HIV-negative men who have sex with men (MSM)
- Beyond the shape and direction of change in depressive symptoms (i.e., does it remain flat, increase, or decrease), we also aimed to quantify the extent patterns of drug use contribute to the differences in depressive symptomatology and whether these differences were modified by HIV-status

Methods

- Participants included 534 men who were enrolled in the mSTUDY, an NIH/NIDA funded (U01DA036267) cohort study between August 2014 and June 2018 in Los Angeles, CA
- Eligible participants were:
 - ≥18 and <45 years of age at enrollment
 - male at birth
 - and if HIV-negative reported condomless anal intercourse with a male partner in the past six months
- Self-interviews were used at baseline and semi-annual visits to collect information on depressive symptoms (using the CES-D₂₀ score ≥23), substance use, and sexual behaviors
- Factors associated with depressive symptoms were evaluated using regression analysis with generalized estimating equations and changes over time were evaluated using individual growth curve modeling

Results

- At baseline the average age was 31 years with 43% identifying as Black/African American, 37% Latino/Hispanic, and 14% white; nearly half reported being unemployed; and 35% reported experiencing unstable housing in the 6 months prior to study enrollment
- By design 50% of our study participants were HIV-positive (n=267) and 50% were HIV-negative
- Average CES-D₂₀ score was 19.5 and prevalence of depressive symptoms (CES-D₂₀ ≥23) across 1,888 visits
- The prevalence of depressive symptoms was higher in visits where participants reported unemployment (49% vs. 24%; p value<.01) as well as unstable housing (48% vs. 30%; p value <.01) (Table 1)

Table 1. Prevalence of depressive symptomatology across study visits among mSTUDY participants (8/2014 - 6/2018)

	Total (n=1,888 visits)		P value**
	CES-D Score ≥ 23 n	%	
Total	656	34.8	--
Socio-demographic characteristics			
Age at study visit, mean (SD)			0.76
CES-D Score ≥ 23	32.4 (6.8)		
CES-D Score < 23	32.5 (7.1)		
Race/ethnicity			
African American	279	35.1	0.95
Hispanic/Latino	218	32.7	
Other	61	37.9	
White	98	37.0	
Unemployed			
Yes	385	49.2	<.01
No	248	23.9	
Unstable Housing, past 6 months*			
Yes	252	48.2	<.01
No	404	29.6	
Substance use behaviors			
Smoker, current (cigarettes)			<.01
Yes	266	49.3	
No	325	29.1	
Binge drinking, past 6 months			
Yes	329	35.5	0.73
No	326	34.2	
Substance use (mutually exclusive categories), past 6 months			
Methamphetamine use	338	47.1	<.01
Other substance use (excluding methamphetamine)	204	30.6	
No substance use	113	22.8	
Sexual behaviors			
Gender of Sex Partners, past 6 months			0.07
Male only	598	34.0	
Male and Female	58	45.0	
New Sex Partner, past 6 months			
Yes	461	37.4	0.01
No	195	29.8	
Transgender Anal Sex Partner, past 6 months			
Yes	66	49.3	0.01
No	590	33.7	
Intimate Partner Violence, past 12 months**			
Yes	158	54.5	<.01
No	478	30.9	
Concurrent Sexual Partnership, past 6 months			
Yes	248	34.4	0.98
No	323	32.8	
Received \$/drugs/shelter for sex, past 3 months			
Yes	172	57.5	<.01
No	449	29.7	

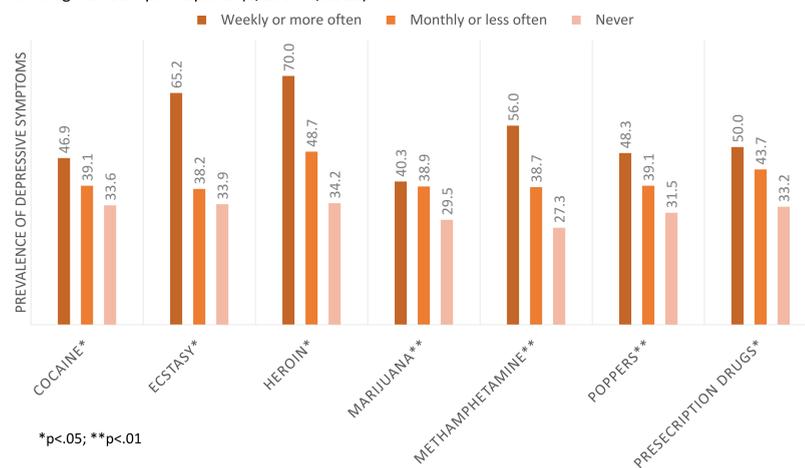
Abbreviations. SD=Standard Deviation

*p value adjusts for the effect of the subject (i.e. multiple observations for the same participant)

Results cont'd

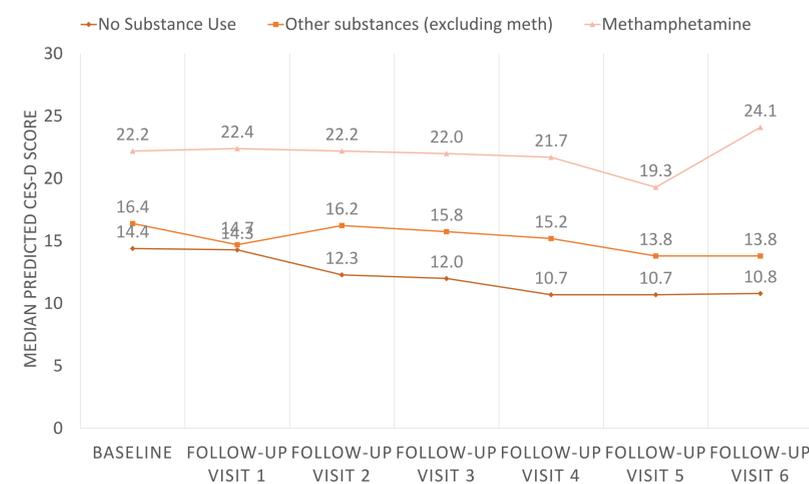
- Among visits where participants reported methamphetamine use, nearly half reported depressive symptoms, as compared to 31% in visits where other drugs were reported (but not methamphetamine) and lowest in visits with no substance use (23%; p value<.01)(Table 1)
- Further exploration of substance use reveals a dose response relationship between amount of substance use and prevalence of depressive symptoms, with those in the highest use category (i.e., weekly or more often) having the highest prevalence of depressive symptoms as compared to those in the monthly or less often, and no drug use categories (Figure 1)

Figure 1. Prevalence of depressive symptoms by type and amount of substance use (past 6 months) among mSTUDY participants (8/2014-6/2018)



- Based on linear growth modelling we found that
 - Methamphetamine use accounted for 10.2% of the individual differences in depressive symptoms, more than any of the other substance we examined including cocaine, ecstasy, heroin, marijuana, party drugs, poppers, and prescription drugs which only accounted for anywhere between <1 to 1.5% of the individual variance in depressive symptoms
 - Additionally, we found that frequent methamphetamine users had a 5.4 point increase in depressive symptom scores compared to non-users (p value<.01), reduced to a 2.5 point increase among occasional methamphetamine users (compared to non-users; p value<.01) and this remained even after controlling for HIV-status
 - Across study visits we saw a clinically and statistically meaningful difference between depressive symptom scores when comparing methamphetamine users to other substance users and non-substance users (Figure 2)
 - There were significant declines in depressive symptoms for heavy users of a number of drugs, though this was not the case for methamphetamine users. For instance, participants who reported using heroin weekly or more often had a 3.38 point decline in CESD₂₀ scores overtime (p value=0.01), with similar patterns noted for heavy users of cocaine, ecstasy, and party drugs). However, methamphetamine users, especially heavy methamphetamine users on average had much higher CESD₂₀ scores

Figure 2. Predicted CESD scores across study visit, by substance use status among mSTUDY participants (8/2014-6/2018)



Conclusions

- The prevalence of depressive symptoms among this cohort of high risk HIV-negative and HIV-positive MSM was relatively high, especially among substance users
- These findings suggest that reducing substance use and methamphetamine in particular may reduce harms from related depressive symptoms and other co-occurring issues such as sexual risk behaviors

