

functional disruptions of the LHPA axis, the brain's primary stress-response system. It has been hypothesized that various trauma-induced neurobiological changes may lead to later physical health, mental health, and psychosocial problems in persons with early life adversity. One area that such changes might affect is a person's ability to stop abusing substances, with factors such as trauma-related mood, self-efficacy, or cognitive functioning as considerations in early treatment success. This study followed a group of participants in a residential substance abuse treatment program across their first month of abstinence, to assess natural change in cognitive performance as well as potential effect of early life adversity on changes in neuropsychiatric outcomes.

Participants and Methods: Participants were 37 adults (mean age=33.9 years, SD=6.7) who had completed detoxification and were first assessed during their first week of residential treatment. Follow-up assessment was completed 4 weeks later. Participants were primarily male (62%) and white (62%). They were all in treatment for opioid abuse, with a majority of participants reporting a history of polysubstance abuse. To measure adverse and protective factors, participants completed the Adverse Childhood Experiences scale and Protective And Compensatory Experiences Scale at baseline. Participants also completed the NIH Toolbox cognition battery and a set of self-report measures of cognitive functioning, mood, anxiety, and self-efficacy at baseline and follow up.

Results: Results of paired samples t-test comparison between baseline and follow-up testing found a significant improvement in self-reported depression symptoms, anxiety symptoms, and self-efficacy (all $p < .001$). Interestingly, participants overall reported an increase in cognitive problems between baseline and retest, even though on objective cognitive testing (NIH Toolbox cognition battery) there was significant improvement in cognitive performance. Participants generally had a high level of childhood adversity (mean ACE score of 4.5), with an average level of childhood compensatory experiences. Considering the specific effect for childhood adversity, ACE score was found to be predictive in amount of anxiety and self-reported cognitive change but not for objective cognitive performance or change in other factors.

Conclusions: Consistent with previous research, these patients had a high level of past

trauma, which interacted with a number of other neuropsychiatric measures and support the importance of assessing for trauma history and integrating trauma-focused treatment into substance abuse treatment programs.

Categories: Addiction/Dependence

Keyword 1: addiction or dependence

Keyword 2: cognitive functioning

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4 Methamphetamine, cannabis, HIV, and their combined effects on neurocognition

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Objective: Methamphetamine and cannabis are two widely used substances with possibly opposing effects on aspects of central nervous system functioning. Use of these substances is prevalent among people with HIV (PWH), though their combined effects on HIV-associated neurocognitive impairment (NCI) are unknown. Adverse effects of methamphetamine use on cognition are well documented. Cannabis may disturb cognition acutely, though its longer-term effects in PWH are not well understood. Our prior analysis of people without HIV (PWoH) found that cotemporaneous cannabis use was associated with better neurocognitive outcomes among methamphetamine users. The aim of this study was to assess how lifetime cannabis and methamphetamine use disorder relate to neurocognitive outcomes in PWH.

Participants and Methods: HIV-positive participants (n=472) were on average 45.6±11.5 years of age, male (86.4%), White (60.6%), and educated 13.9±2.5 years. Most participants were on ART (81.9%) and virally suppressed

(70%). Participants were stratified by lifetime methamphetamine (M-/M+) and cannabis (C-/C+) DSM-IV abuse/dependence disorder into four groups: M-C- (n=187), M-C+ (n=68), M+C-, (n=82) and M+C+ (n=135) and completed a comprehensive neurobehavioral assessment. Demographically corrected T-scores and deficit scores were used for analyses. Group differences in global and domain NC performances (i.e., T-scores) were examined using multiple linear regression, holding constant covariates that were associated with study groups and/or cognition. Specifically, M+ participants displayed higher rates of Hepatitis C infection ($p=.004$), higher current depressive symptom scores ($p<.001$), and higher rates of detectable plasma HIV RNA ($p=.014$). Multiple logistic regression was used to test for group differences in probability of neurocognitive impairment (i.e., deficit scores ≥ 0.5), including the same covariates. Pooling data with a sample of HIV-negative participants (n=423), we used generalized linear mixed effect models to examine how neurocognitive performance and impairment profiles varied by methamphetamine and/or cannabis use group, HIV disease characteristics, and their interactions.

Results: Compared to M+C+, M+C- performed worse on measures of executive functions ($\beta=-3.17$), learning ($\beta=-3.95$), memory ($\beta=-5.58$), and working memory ($\beta=-4.05$) and were more likely to be classified as impaired in the learning (OR=2.93), memory (OR=5.24), and working memory (OR=2.48) domains. M-C- performed better than M+C+ on measures of learning ($\beta=3.46$) and memory ($\beta=5.19$), but worse than M-C+ on measures of executive functions ($\beta=-3.90$), learning ($\beta=-3.32$), memory ($\beta=-3.38$), and working memory ($\beta=-3.38$). Generalized linear mixed effect models indicate that detectable plasma HIV RNA ($\beta=-1.85$) and low nadir CD4 T-cell counts (nadir CD4 <200 ; $\beta=-1.07$) were associated with worse neurocognitive performance, and these effects did not differ in size or direction by substance use group.

Conclusions: In PWH, lifetime methamphetamine use disorder and both current and legacy markers of HIV disease severity are associated with worse neurocognitive outcomes. Cannabis use disorder does not appear to exacerbate methamphetamine-related deficits in PWH. Instead, results are consistent with findings from preclinical studies that cannabis use may protect against methamphetamine's deleterious effects. Profile analysis models showed that participants

with a history of cannabis use disorder display better overall neurocognitive performance than comparison (M-C-) participants. Mechanisms underlying a potential protective effect of cannabis may be elucidated by examining the temporal relationship between cannabis and methamphetamine consumption and neurocognitive performance.

Categories: Addiction/Dependence

Keyword 1: HIV/AIDS

Keyword 2: methamphetamine

Keyword 3: cannabis

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5 Psychomotor Speed and Duration of Use in Alcohol Dependent Individuals

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Objective: Chronic alcohol consumption has been associated with widespread cognitive deficits, including psychomotor speed. Researchers have found impairments in reaction speed, information processing, and fine-finger movement in alcoholics (Oscar-Berman et al., 2015). There have also been mixed findings on the impact of duration of alcohol use on neurocognitive functioning (Beatty et al., 2000; Oscar-Berman et al., 2004). This meta-analytical study examines: (a) the performance of abstinent alcohol-dependent individuals on psychomotor speed using the Trail Making Test-A (TMT-A), and (b) the effect of duration of alcohol use on TMT-A.

Participants and Methods: As part of a larger study, two researchers independently searched eight databases, extracted required data, and calculated effect sizes on neuropsychological data in alcohol dependent (AD) individuals. Inclusion criteria for articles were: (a) comparison of abstinent alcohol-dependent