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“Sex-Specific Impact of Alcohol and Cannabis Co-Use on Cognitive Function”

Objective: Alcohol and cannabis co-use – whether concurrent (on separate occasions) or simultaneous (at the same time) – is a common pattern of polysubstance misuse. While previous studies from our group and others have linked alcohol and cannabis use to impairments in various domains of cognitive functioning, the effects of their co-use on cognition remain poorly understood. The purpose of this study was to examine the impact of combined alcohol and cannabis use and hazardous use on cognitive function.

Methods: We examined HIV-negative individuals that were enrolled as control participants in the longitudinal New Orleans Alcohol Use in HIV (NOAH) Study (n=53). Recent alcohol use was assessed using blood levels of phosphatidylethanol (PEth), with concentrations ≥ 8 ng/mL indicating consumption within the past 2–4 weeks. Cannabis use frequency (past 30 days and lifetime use) was measured using the Addiction Severity Index (ASI). Hazardous alcohol use or Alcohol Use Disorder (AUD) risk was identified by an Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) score of ≥ 4 for men and ≥ 3 for women. Hazardous cannabis use (≥ 8 points) and Cannabis Use Disorder (CUD; ≥ 12 points) were determined using the Cannabis Use Disorder Identification Test–Revised (CUDIT-R). Cognitive function was assessed with the Montreal Cognitive Assessment (MoCA).

Results: No significant differences in past-month cannabis use, lifetime cannabis use, and current alcohol use were observed between female (n=21) and male (n=32) participants. Male participants with AUDIT-C scores ≥ 8 demonstrated a significantly lower MoCA scores ($p=0.0455$) compared with those scored < 8 . In contrast, no significant differences in MoCA scores were observed among female participants with AUDIT-C ≥ 8 and AUDIT-C < 8 . With regard to lifetime substance use, cannabis-only users trended toward significantly higher MoCA scores compared with non-users ($p=0.0689$) across both sexes.

Conclusion: Patterns of alcohol and cannabis use and co-use were differentially associated with cognitive performance in a sex-specific fashion. Hazardous alcohol use was linked to cognitive impairment among males, whereas this association was not observed in females. These findings highlight the complex and sex-specific effects of substance use on cognition and underscore the need for tailored approaches in clinical assessment and intervention.