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Time-dependent Association between Recreational Cannabinoid Use and Memory Performance in Healthy Adults: A Neuroimaging Study of Human Connectome Project

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Abstract : Background: There is mixed evidence regarding the association between recreational cannabinoid use and memory performance. One of the major reasons for the present controversy is different cannabinoid use-related covariates that influence the cognitive status of an individual. Adjustment of these confounding variables provides accurate insight into the real effects of cannabinoid use on memory status. In this study, we sought to investigate the association between recent recreational cannabinoid use and memory performance while correcting the model for other possible covariates such as demographic characteristics and duration, and amount of cannabinoid use. Methods: Cannabinoid users were assigned to two groups based on the results of THC urine drug screen test (THC+ group: n = 110, THC- group: n = 410). THC urine drug screen test has a high sensitivity and specificity in detecting cannabinoid use in the last 3-4 weeks. The memory domain of NIH Toolbox battery and brain MRI volumetric measures were compared between the groups while adjusting for confounding variables. Results: After Benjamini-Hochberg p-value correction, the performance in all of the measured memory outcomes, including vocabulary comprehension, episodic memory, executive function/cognitive flexibility, processing speed, reading skill, working memory, and fluid cognition, were significantly weaker in THC+ group (p values less than 0.05). Also, volume of gray matter, left supramarginal, right precuneus, right inferior/middle temporal, right hippocampus, left entorhinal, and right pars orbitalis regions were significantly smaller in THC+ group. Conclusions: this study provides evidence regarding the acute effect of recreational cannabis use on memory performance. Further studies are warranted to confirm the results.

Keywords : brain MRI, cannabis, memory, recreational use, THC urine test
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