Cannabis increases susceptibility to false memory

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Previous studies demonstrate that cannabis is associated with deficits in decision making and working memory, particularly concerning increased cannabinoid receptor type 1 (CB1) activation in the hippocampus. This suggests the possibility that CB1 activation underlies the formation of incidental associations and predicts an increase in false memories. Association with increased false memories has implications on the justice system, raising the question of intoxicated eyewitness and perpetrator reliability during investigative interviews. Kloft et al. assessed Δ9-tetrahydrocannabinol (THC) intoxication’s impact on associative memory and false-memory production in healthy, occasional cannabis users.

The clinical trial assessed false-memory rates of a placebo and experimental group immediately after treatment and after one week when fully sober. Participants in the experimental group inhaled a single dose of THC vapor (300 μg per kilogram body weight) before assessment. The trial used three assessments: an associative memory test and two virtual reality scenarios. The associative memory test assessed the Deese/Roediger-McDermott (DRM) paradigm, a phenomenon in which participants may falsely remember words not actually presented in an associatively related list of words. The two virtual reality scenarios required participants to act as an eyewitness and perpetrator in a simulation, undergo a series of suggestive misleading questions in interview, and receive a memory test.

In all three tests, intoxicated participants demonstrated higher false-memory rates during the immediate stage of testing. In the DRM assessment, intoxicated individuals presented lower memory accuracy both immediately and after one week. However, in both virtual reality scenarios, intoxicated individuals only presented lower memory accuracy in the immediate stage of recall; this effect disappeared after one week when participants were fully sober.

Overall, the trial demonstrated that higher false-memory rates are more pronounced in intoxicated individuals in their immediate condition. This implies that individuals under THC’s influence may be at higher risk to form multiple forms of memory errors. This threatens investigative settings, especially if justice systems use suggestive questions that can mislead interviewees. Future actions may require labeling THC-intoxicated individuals as a vulnerable group, with children and the elderly.