

Sleep deprivation and methamphetamine – seeking behavior: a role for the cannabinoid CB1 receptors

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Abstract

Susceptibility to interference can be a result of memory retrieval and reconsolidation. Given the fact that addiction develops through the neural mechanisms of learning and memory, it would not be surprising that a consolidated drug reward memory may also be susceptible to interference following retrieval/reconsolidation. Due to the critical role of sleep in memory consolidation, sleep deprivation (SD) has been shown to impair memory. Therefore, the major objective of this study was to investigate the effect of rapid eye movement (REM) sleep deprivation (RSD) on the retrieval and reconsolidation of methamphetamine (METH) reward memory in male rats. The animals were trained to acquire METH-induced CPP (2 mg/kg, i.p.). METH reward memory was then reactivated/retrieved in the drug-paired chamber during a drug-free (memory reactivation) session. A period of 48-h RSD paradigm using the multiple platform technique resulted in persistent deficits in the retrieval of METH reward memory. Nevertheless, the same protocol of RSD, which was conducted immediately after the memory reactivation, did not affect the reconsolidation of METH reward memory. Additionally, the RSD episode induced a temporary potentiation of METH-induced hyper locomotion. Our findings would seem to suggest that sleep is involved in the retrieval, but not reconsolidation, of METH reward memory. The results may also demonstrate that RSD mimics the effects of METH on loco motor activity. The results of this study, therefore, support the idea that sleep is involved in the processing of METH reward memory which can be considered for further investigations to manage the relapse associated with drug-related memory.

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Biography

Mehdi Khodamoradi, a young faculty member (Assistant Professor) at Kermanshah University of Medical Sciences, Kermanshah, Iran. I have B.Sc. in Radiology (from Shahid Beheshti University of Medical Sciences, Tehran, Iran), M.Sc. in Anatomical Sciences (from Mashhad University of Medical Sciences, Mashhad, Iran), and Ph.D. in Neuroscience (from Kerman University of Medical Sciences,

Kerman, Iran). I have experienced a period of internship at Cognitive Brain Mapping Laboratory, RIKEN Brain Science Institute, Japan (2011). I have also participated with a presentation at three IBRO/APRC Neuroscience School at Tehran, Iran (2013), Varanasi, India (2015), and Chandigarh, India (2016). My favorite research areas are the linking between learning and memory mechanisms, sleep loss and addictive behaviors using experimental (rodent) models.