

عنوان مقاله:

Cinnamaldehyde improves methamphetamine-induced spatial learning and memory deficits and restores ERK signaling in the rat prefrontal cortex

محل انتشار:

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خلاصه مقاله:

Objective(s): Methamphetamine is a stimulant compound that penetrates readily into the central nervous system. Repeated exposure to methamphetamine leads to damage in the dopaminergic and serotonergic axons of selected brain regions. Previous studies showed that cinnamaldehyde improved memory impairment in animals. In the present study, we aimed to elucidate the effects of cinnamaldehyde on methamphetamine-induced memory impairment in rats. **Materials and Methods:** Male Wistar rats received methamphetamine (10 mg/kg, intraperitoneally) for 7 days. Thirty minutes before each injection, animals were given cinnamaldehyde (20, 40, or 80 mg/kg) or rivastigmine (1 mg/kg). The spatial learning and memory were examined using the Morris water maze test. The expression of extracellular signal-regulated kinase (ERK) phosphorylation in the frontal cortex and hippocampus was also detected by immunohistochemical method. **Results:** Administration of methamphetamine increased the latency to find the platform in the learning phase, while administration of cinnamaldehyde (40 mg/kg) or rivastigmine before methamphetamine reversed the increased latency. Administration of cinnamaldehyde, at the dose of 40 mg/kg with methamphetamine, increased the time and distance traveled in the target quadrant in comparison with the amphetamine group. Moreover, the methamphetamine and cinnamaldehyde-treated group had higher expression of phosphorylated ERK1/2 in the prefrontal cortex in comparison with the methamphetamine-treated animals. **Conclusion:** The present data demonstrated that repeated METH administration impaired cognitive performance through the ERK pathway and decreased the phosphorylation of ERK1/2 in the prefrontal cortex while administration of cinnamaldehyde restored both effects. Accordingly, cinnamaldehyde may be a valuable therapeutic tool for the treatment of cognitive deficits

کلمات کلیدی:

Cinnamaldehyde, ERK1/2, Learning deficit, Memory deficit, Methamphetamine

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