

Preventive effects of L-theanine on reinstatement of methamphetamine conditioned place preference

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Background

Methamphetamine (METH) abuse is a significant public health problem worldwide. L-theanine, an amino acid analogue of L-glutamate and L-glutamine, has previously been shown to modulate levels of glutamate, GABA, and dopamine in various neural regions.

Aims & Objectives

The present study employed the conditioned place preference (CPP) paradigm in Sprague-Dawley rats to investigate the effects of L-theanine on the acquisition, extinction, and reinstatement of the place-conditioned response.

Methods

L-theanine (3 or 10 mg/kg) and vehicle were administered at different session of CPP. Experiment 1: L-theanine was given 30 min prior to each METH conditioning session to determine its effect on acquisition of CPP. Experiment 2: L-theanine was administered 30 min before reinstatement to test its acute effect on reinstatement. Experiment 3: L-theanine was repeatedly administered after each extinction session to determine whether it can facilitate extinction memory and reduce the reinstatement. Experiment 4: the effects of repeated administration of L-theanine for 5 days during forced abstinence on following extinction and reinstatement were assessed.

Results

The results demonstrated that L-theanine did not affect acquisition of METH-induced CPP and significantly reduced the reinstatement acutely. Furthermore, L-theanine facilitated the extinction and reduced the reinstatement when given after each extinction session and during forced abstinence.

Discussion & Conclusion

These findings suggested that L-theanine might have the anti-relapse potential to METH addiction, although it did not affect reinforcing effect of methamphetamine.