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N-METHYL-D-ASPARTATE RECEPTORS ARE INVOLVED IN THE EFFECT OF LITHIUM ON PASSIVE AVOIDANCE MEMORY IN MICE

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In the present study, the effects of intracerebroventricular (i.c.v.) injections of N-methyl-D-aspartate (NMDA) receptor agonist and antagonist on the lithium state-dependent memory have been investigated. For memory assessment, one-trial step-down passive avoidance task was used in adult male NMRI mice. Post-training intraperitoneal (i.p.) administration of lithium (10 mg/kg) impaired the memory of passive avoidance task. Pre-test administration of the same dose of the drug (10 mg/kg) restored impairment of memory by lithium given after training. This is known as state-dependent memory. In addition, pre-test administration of both NMDA receptor agonist (NMDA; 0.01 and 0.1 ng/mouse, i.c.v.) and the non-competitive NMDA receptor antagonist, MK-801 (0.1 and 0.5 mg/mouse, i.c.v) also restored impairment of memory induced by post-training lithium. On the other hand, pre-test co-administration of ineffective dose of NMDA (0.001 ng/mouse, i.c.v.) or MK-801 (0.001 mg/mouse, i.c.v) with lower doses of lithium (1.25, 2.5 and 5 mg/kg, i.p.) increased the restoration of memory by lithium. The results suggest that NMDA receptors are involved, at least partly, in the lithium state-dependent memory of passive avoidance task.